



**Invitation for Bid No. 2021-051**  
**853W Zone Improvements**  
**Phase 1 Transmission Mains**  
**Rocky River Road & Secrest Shortcut Road**

**Due Date:** March 04, 2021

**Time:** 2:00 PM EST

**Receipt Location:** Union County Government Center  
Procurement Department  
500 N. Main Street, Suite 709  
Monroe, NC, 28112-4730

**Procurement Representative:**

Vicky Watts, CLGPO  
Senior Procurement Specialist  
(704) 283-3601  
vicky.watts@unioncountync.gov

**Prepared by:**

Black & Veatch International Co.  
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Charlotte, NC 28262  
(704) 548-8461  
NC License No. F-0794

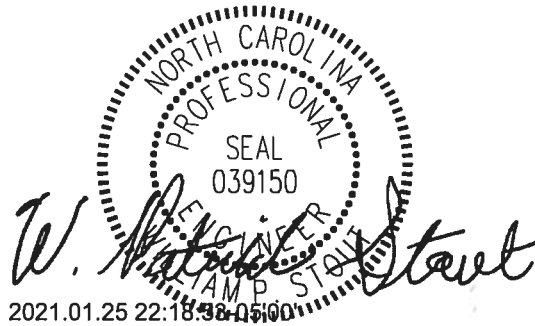


**PROJECT MANUAL**

**UNION COUNTY  
PUBLIC WORKS DEPARTMENT**

**853W ZONE IMPROVEMENTS  
PHASE 1 TRANSMISSION MAINS  
ROCKY RIVER ROAD & SECREST SHORTCUT ROAD**

**UNION COUNTY, NORTH CAROLINA**



**January 26, 2021**

**Union County Public Works Project Number WT-061**

**B&V Project 186110**

**Black & Veatch  
International Company  
Business License F-0794  
10715 David Taylor Drive, Suite 280  
Charlotte, NC 28262**





UNION COUNTY PUBLIC WORKS DEPARTMENT

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**UNION COUNTY  
UNION COUNTY, NORTH CAROLINA  
853W ZONE IMPROVEMENTS – PHASE 1  
IFB # 2021-051**

ADVERTISEMENT FOR BIDS

Sealed Bids for the construction of the **853W Zone Improvements Phase 1 Transmission Mains** will be received by Union County Procurement Department, Union County Government Center at 500 N. Main Street, Suite 709, Monroe, North Carolina 28112, until **\*2:00 PM** local time on **March 04, 2021**, at which time the Bids received will be publicly opened and read. Late bids will not be accepted. **If you plan to attend the bid opening, masks and social distancing rules apply.**

\*On **March 04, 2021**, beginning at **1:30 PM** local time, bids will be received by the Union County Procurement Department at the bid opening location of Union County Government Center, 500 North Main Street, 1<sup>st</sup> Floor, Board of County Commissioner’s Chambers, Monroe, NC 28112.

The Project consists of constructing the following major items:

- Furnish and install approximately 24,300 LF of 36” ductile iron water transmission pipeline
- Furnish and install approximately 3,200 LF of 16” ductile iron water transmission pipeline
- Furnish and install all associated fittings, valves, air-release valve structures, blow-offs, tie-ins, interconnections, services, clearing, erosion control, cleaning, disinfection and testing, pipeline abandonment and all other pipeline work shown on the Drawings and described in the Specifications.

Bids will be received for a single prime Contract. Bids shall be on a unit price basis as indicated in the Bid Form.

All questions about the meaning or intent of the Bidding Documents are to be submitted, in writing, to the Procurement contact person listed on the cover page (vicky.watts@unioncountync.gov).

The Issuing Office for the Bidding Documents is:

**Black & Veatch International Company**  
**10925 David Taylor Drive, Suite 280,**  
**Charlotte, NC 28262,**  
**Contact: Ashley Tucker**  
**704-510-8464**  
[TuckerA@bv.com](mailto:TuckerA@bv.com)

Prospective Bidders may examine the Bidding Documents at the Issuing Office or at the Union County Procurement Department offices at 500 North Main Street, 7th Floor, Suite 709, Monroe, North Carolina 28112 on Mondays through Fridays between the hours of 8:00 am and 5:00 pm, and may obtain copies of the Bidding Documents from the Issuing Office as described below.

Bidding Documents may be viewed online at Construct Connect.

Printed copies of the Bidding Documents may be obtained from the Issuing Office, during the hours indicated above, upon payment of a non-refundable deposit of \$ 150.00 for each set. Checks for Bidding Documents shall be payable to “**Black and Veatch**”. Upon request and receipt of the document deposit indicated above, the Issuing Office will transmit the Bidding Documents, including printed hard copies and one (1) compact disk containing documents in electronic format, via delivery service. The date that the Bidding Documents are transmitted by the Issuing Office will be considered the Bidder’s date of receipt of the Bidding Documents. Partial sets of Bidding Documents will not be available from the Issuing Office. Neither Owner nor Engineer will be responsible for full or partial sets of Bidding Documents, including Addenda if any, obtained from sources other than the Issuing Office.

Bidders must have a license to do work as a general contractor in the State of North Carolina, as set forth under Article 1 of Chapter 87 of the North Carolina General Statutes. The Contractor’s North Carolina License number shall be designated on the outside of the envelope containing the bid.

Bidders are required to comply with the non-collusion requirements set forth in the Bidding Documents.

Bid security shall be furnished in accordance with the Instructions to Bidders.

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

Union County encourages good faith effort outreach to Minority Businesses (HUB Certified) and Small Businesses.

END OF ADVERTISEMENT FOR BIDS

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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.

## **ARTICLE 2 – COPIES OF BIDDING DOCUMENTS**

2.01 Complete sets of the Bidding Documents may be obtained from the Issuing Office in the number and format stated in the advertisement or invitation to bid.

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

2.03 Owner and Engineer, in making copies of Bidding Documents available on the above terms, do so only for the purpose of obtaining Bids for the Work and do not authorize or confer a license for any other use.

## **ARTICLE 3 – QUALIFICATIONS OF BIDDERS**

3.01 To demonstrate Bidder's qualifications to perform the Work, Bidder shall submit with its Bid (a) written evidence establishing its qualifications such as financial data, previous experience, and present commitments, and (b) the following additional information:

A. Evidence of Bidder's authority to do business in the state where the Project is located.

B. Bidder's state or other contractor license number, if applicable.

C. Subcontractor and Supplier qualification information; coordinate with provisions of Article 12 of these Instructions, "Subcontractors, Suppliers, and Others."

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.

3.04 Bidder is advised to carefully review those portions of the Bid Form requiring Bidder's representations and certifications.

## **ARTICLE 4 – SITE AND OTHER AREAS; EXISTING SITE CONDITIONS; EXAMINATION OF SITE; OWNER'S SAFETY PROGRAM; OTHER WORK AT THE SITE**

4.01 *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.

#### 4.02 *Existing Site Conditions*

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

1. The Supplementary Conditions identify:
  - a. those reports known to Owner of explorations and tests of subsurface conditions at or adjacent to the Site.
  - b. those drawings known to Owner of physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities).
  - 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.

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: Information and data shown or indicated in the Bidding Documents with respect to existing Underground Facilities at or contiguous to the Site are set forth in the Contract Documents and are based upon information and data furnished to Owner and Engineer by owners of such Underground Facilities, including Owner, or others.
- C. Adequacy of Data: Provisions concerning responsibilities for the adequacy of data furnished to prospective Bidders with respect to subsurface conditions, other physical conditions, and Underground Facilities, and possible changes in the Bidding Documents due to differing or unanticipated subsurface or physical conditions appear in Paragraphs 4.02, 4.03, and 4.04 of the General Conditions. Provisions concerning responsibilities for the adequacy of data furnished to prospective Bidders with respect to a Hazardous Environmental Condition at the Site, if any, and possible changes in the Contract Documents due to any Hazardous Environmental Condition uncovered or revealed at the Site which was not shown or indicated in the Drawings or Specifications or identified in the Contract Documents to be within the scope of the Work, appear in Paragraph 4.06 of the General Conditions.

#### 4.03 *Site Visit and Testing by Bidders*

- A. Bidder shall conduct the required Site visit during normal working hours, and shall not disturb any ongoing operations at the Site.
- B. Bidder is not required to conduct any subsurface testing, or exhaustive investigations of Site conditions.

- C. On request, and to the extent Owner has control over the Site, and schedule permitting, the Owner will provide Bidder 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.
- D. Bidder shall 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.
- E. Bidder shall fill all holes and clean up and restore the Site to its former condition upon completion of such explorations, investigations, tests, and studies.

4.04 *Owner's Safety Program*

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

4.05 *Other Work at the Site*

- A. Reference is made to Article 7 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 5 – BIDDER'S REPRESENTATIONS**

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

- A. examine and carefully study the Bidding Documents, and any data and reference items identified in the Bidding Documents;
- B. visit the Site, conduct a thorough, alert visual examination of the Site and adjacent areas, and become familiar with and satisfy itself as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work;
- C. become familiar with and satisfy itself as to all Laws and Regulations that may affect cost, progress, and performance of the Work;
- D. carefully study all: (1) reports of explorations and tests of subsurface conditions at or adjacent to the Site and all drawings of physical conditions relating to existing surface or subsurface structures at the Site that have been identified in the Supplementary Conditions, especially with respect to Technical Data in such reports and drawings, and (2) reports and drawings relating to Hazardous Environmental Conditions, if any, at or adjacent to the Site that have been identified in the Supplementary Conditions, especially with respect to Technical Data in such reports and drawings;

- E. consider 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 Site-related reports and drawings identified in the Bidding Documents, with respect to the effect of such information, observations, and documents on (1) the cost, progress, and performance of the Work; (2) the means, methods, techniques, sequences, and procedures of construction to be employed by Bidder; and (3) Bidder's safety precautions and programs;
- F. agree, based on the information and observations referred to in the preceding paragraph, that at the time of submitting its Bid no further examinations, investigations, explorations, tests, studies, or data are necessary for the determination of its Bid for performance of the Work at the price bid and within the times required, and in accordance with the other terms and conditions of the Bidding Documents;
- G. become aware of the general nature of the work to be performed by Owner and others at the Site that relates to the Work as indicated in the Bidding Documents;
- H. promptly give Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder discovers in the Bidding Documents and confirm that the written resolution thereof by Engineer is acceptable to Bidder;
- I. determine that the Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for the performance and furnishing of the Work; and
- J. agree that the submission of a Bid will constitute an incontrovertible representation by Bidder that Bidder has complied with every requirement of this Article, that without exception the Bid and all prices in the Bid are premised upon performing and furnishing the Work required by the Bidding Documents.

## **ARTICLE 6 – PRE-BID CONFERENCE**

6.01 Not Used.

## **ARTICLE 7 – INTERPRETATIONS AND ADDENDA**

- 7.01 All questions about the meaning or intent of the Bidding Documents are to be submitted to the Procurement contact person listed on the cover page, [vicky.watts@unioncountync.gov](mailto:vicky.watts@unioncountync.gov), in writing. Interpretations or clarifications considered necessary by Engineer in response to such questions will be issued by Addenda delivered to all parties recorded as having received the Bidding Documents. Questions received after 5pm on February 23, 2021 may not be answered. Only questions answered by Addenda will be binding. All such changes or interpretations will be made in writing in the form of Addenda, and, if issued, will be mailed or sent by available means to all known prospective bidders not later than seventy two (72) hours prior to the established bid opening date time. Oral and other interpretations or clarifications will be without legal effect.
- 7.02 Addenda may be issued to clarify, correct, supplement, or change the Bidding 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 certified check, bank money order, or a Bid bond (on the form included in the Bidding Documents) issued by a surety meeting the requirements of Paragraphs 5.01 and 5.02 of the General Conditions.
- 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 Documents, 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 Documents and furnish the required contract security within ten (10) 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.
- 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 seven days after the Effective Date of the Contract or one (1) day more than the period for which Bids are subject to acceptance, 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 seven days after the Bid opening.

**ARTICLE 9 – CONTRACT TIMES**

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

**ARTICLE 10 – LIQUIDATED DAMAGES**

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

**ARTICLE 11 – SUBSTITUTE AND “OR-EQUAL” ITEMS**

- 11.01 The Contract 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 at least 15 days prior to the date for receipt of Bids. Each such request shall comply with the requirements of Paragraph 6.05 of the General Conditions. 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 prospective Bidders. Bidders shall not rely upon approvals made in any other manner.

It is the intent of the Contract Documents to comply with N.C.G.S. §133-3 and to encourage free and open competition on public contracts. However, nothing in this Subparagraph is intended to



permit bidders to submit proposals for the use of products or materials which have not been approved by Engineer prior to the receipt of bids as provided by N.C.G.S. §133-3. All submittals for substitution approval shall be made in accordance with the provisions of these Instructions to Bidders:

- A. Wherever the Specifications list only required performance and design characteristics for a product or material, bidders wishing to provide such a product or material shall submit such for approval.
- B. Where the Specifications list three or more names of products or materials, the listed examples are used only to denote the quality standard of product desired and do not restrict bidders to a specific brand, make, manufacturer or specific name. Rather, they are used only to set forth and convey to bidders the general style, type, character and quality of product desired. Products of similar general style, type, character appearance, and quality may be submitted for approval.
- C. Where the Specifications list fewer than three names of product or material, such products are the only products known to Engineer that comply with the required style, type, character appearance, and quality necessary for this product. Bidders wishing to propose equivalent products may do so.

11.02 All prices that Bidder sets forth in its Bid shall 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 12 – SUBCONTRACTORS, SUPPLIERS, AND OTHERS**

12.01 In addition to any identification of Subcontractors, Suppliers, individuals, or entities required to be submitted to Owner by the Supplementary Conditions (see third full paragraph below), Bidders shall include in their Bid a list of all subcontractors which the Bidder intends to use.

A contractor whose Bid is accepted shall not substitute any person as subcontractor in the place of the subcontractor listed in the original bid, except (i) if the listed subcontractor's bid is later determined by the contractor to be nonresponsible or nonresponsive or the listed subcontractor refuses to enter into a contract for the complete performance of the bid work, or (ii) with the approval of the awarding authority for good cause shown by the contractor. The terms, conditions, and requirements of each contract between Contractor and a subcontractor performing work under a subdivision or branch of work listed in this subsection shall incorporate by reference the terms, conditions, and requirements of the Contract between Contractor and Owner. Failure to include this list of subcontractors may cause a Bid to be rejected as nonresponsive by Owner.

If the Supplementary Conditions require the identity of certain Subcontractors, Suppliers, individuals, or entities to be submitted to Owner in advance of a specified date prior to the Effective Date of the Agreement, the apparent Successful Bidder, and any other Bidder so requested, shall within five days after Bid opening, submit to Owner a list of all such Subcontractors, Suppliers, individuals, or entities proposed for those portions of the Work for which such identification is required. Such list shall be accompanied by an experience statement with pertinent information

regarding similar projects and other evidence of qualification for each such Subcontractor, Supplier, individual, or entity if requested by Owner. If Owner or Engineer, after due investigation, has reasonable objection to any proposed Subcontractor, Supplier, individual, or entity, Owner may, before the Notice of Award is given, request apparent Successful Bidder to submit a substitute, without an increase in the Bid.

- 12.02 Subsequent to the submittal of the Bid, Owner may not require the Successful Bidder or Contractor to retain any Subcontractor, Supplier, or other individual or entity against which Contractor has reasonable objection.

### **ARTICLE 13 – PREPARATION OF BID**

- 13.01 The Bid Form is included with the Bidding Documents.
- A. All blanks on the Bid Form shall be completed in ink and the Bid Form signed in ink. Erasures or alterations shall be initialed in ink by the person signing the Bid Form.
  - 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.”
- 13.02 A Bid by a corporation shall 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 shall be shown. The corporate seal shall be affixed and attested by the corporate secretary or an assistant corporate secretary.
- 13.03 A Bid by a limited liability company shall 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 shall be shown.
- 13.04 A Bid by an individual shall show the Bidder’s name and official address.
- 13.05 A Bid by a joint venture shall be executed by an authorized representative of each joint venturer in the manner indicated on the Bid Form. The official address of the joint venture shall be shown.
- 13.06 All names shall be printed in ink below the signatures.
- 13.07 The Bid shall contain an acknowledgment of receipt of all Addenda, the numbers of which shall be filled in on the Bid Form.
- 13.08 Postal and e-mail addresses and telephone number for communications regarding the Bid shall be shown.
- 13.09 The Bid shall contain evidence of Bidder’s authority and qualification to do business in the state where the Project is located, or Bidder shall covenant in writing to obtain such authority and qualification prior to award of the Contract and attach such covenant to the Bid. Bidder’s state contractor license number, if any, shall also be shown on the Bid Form.

## **ARTICLE 14 – BASIS OF BID**

### **14.01 Unit Price**

- A. Bidders shall 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 11.03 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.

### **14.02 Allowances**

- A. For cash allowances the Bid price shall 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 11.02.B of the General Conditions.

## **ARTICLE 15 – SUBMITTAL OF BID**

15.01 With each copy of the Bidding Documents, a Bidder is furnished 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 7 of the Bid Form.

15.02 A Bid shall be received no later than the date and time prescribed and at the place indicated in the advertisement or invitation to bid and shall 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 shall 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 shall be enclosed in a separate package plainly marked on the outside with the notation “BID ENCLOSED.” A mailed Bid shall be addressed to

**Union County Procurement Department**

**Attention: Vicky Watts**

**500 N. Main Street Suite 709**

**Monroe, NC 28112**

15.03 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.



- 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.
- 19.04 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.
- 19.05 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 20 – BONDS AND INSURANCE**

- 20.01 Article 5 of the General Conditions, as may be modified by the Supplementary Conditions, sets forth Owner’s requirements as to performance and payment bonds and insurance. When the Successful Bidder delivers the Agreement (executed by Successful Bidder) to Owner, it shall be accompanied by required bonds and insurance documentation.

**ARTICLE 21 – SIGNING OF AGREEMENT**

- 21.01 When Owner issues a Notice of Award to the Successful Bidder, it shall be accompanied by the unexecuted counterparts of the Agreement along with the other Contract Documents as identified in the Agreement. Within ten (10) days thereafter, Successful Bidder shall 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. Thereafter, Owner shall 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**

853W Zone Improvements - Phase I Transmission Mains

Rocky River Road & Secrest Short Cut Road

UCPW Project No. WT-061

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**ARTICLE 1 – BID RECEIPT**

1.01 This Bid is submitted to:

**Vicky Watts, Senior Procurement Specialist  
Union County Procurement Department  
500 N. Main Street, Suite 709  
Monroe, NC 28112  
704-283-3601  
Email: vicky.watts@unioncountync.gov**

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 – BIDDER’S ACKNOWLEDGEMENTS**

2.01 Bidder accepts all of the terms and conditions of the Instructions to Bidders, including without limitation those dealing with the disposition of Bid security. This Bid will remain subject to acceptance for 60 days after the Bid opening, or for such longer period of time that Bidder may agree to in writing upon request of Owner.

**ARTICLE 3 – BIDDER’S REPRESENTATIONS**

3.01 In submitting this Bid, Bidder represents that:

A. Bidder has examined and carefully studied the Bidding Documents, and any data and reference items identified in the Bidding Documents, and hereby acknowledges receipt of the following Addenda:

<u>Addendum No.</u>	<u>Addendum, Date</u>
_____	_____
_____	_____
_____	_____
_____	_____

B. Bidder has visited the Site, conducted a thorough, alert visual examination of the Site and adjacent areas, and become familiar with and satisfied itself as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work.

C. Bidder is familiar with and has satisfied itself as to all Laws and Regulations that may affect cost, progress, and performance of the Work.

D. Bidder has carefully studied all: (1) reports of explorations and tests of subsurface conditions at or adjacent to the Site and all drawings of physical conditions relating to existing surface or subsurface structures at the Site that have been identified in the Supplementary Conditions, especially with respect to Technical Data in such reports and drawings, and (2)

reports and drawings relating to Hazardous Environmental Conditions, if any, at or adjacent to the Site that have been identified in the Supplementary Conditions, especially with respect to Technical Data in such reports and drawings.

- E. 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 any Site-related reports and drawings identified in the Bidding Documents, with respect to the effect of such information, observations, and documents on (1) the cost, progress, and performance of the Work; (2) the means, methods, techniques, sequences, and procedures of construction to be employed by Bidder; and (3) Bidder's safety precautions and programs.
- F. Bidder agrees, based on the information and observations referred to in the preceding paragraph, that no further examinations, investigations, explorations, tests, studies, or data are necessary for the determination of this Bid for performance of the Work at the price bid and within the times required, and in accordance with the other terms and conditions of the Bidding Documents.
- G. Bidder is aware of the general nature of work to be performed by Owner and others at the Site that relates to the Work as indicated in the Bidding Documents.
- H. Bidder has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder has discovered in the Bidding Documents, and confirms that the written resolution thereof by Engineer is acceptable to Bidder.
- I. The Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for the performance and furnishing of the Work.
- J. The submission of this Bid constitutes an incontrovertible representation by Bidder that Bidder has complied with every requirement of this Article, and that without exception the Bid and all prices in the Bid are premised upon performing and furnishing the Work required by the Bidding Documents.

#### **ARTICLE 4 – BIDDER'S CERTIFICATION**

4.01 Bidder certifies that:

- A. 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;
- B. Bidder has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid;
- C. Bidder has not solicited or induced any individual or entity to refrain from bidding; and
- D. Bidder has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for the Contract. For the purposes of this Paragraph 4.01.D:
  - 1. "corrupt practice" means the offering, giving, receiving, or soliciting of any thing of value likely to influence the action of a public official in the bidding process;
  - 2. "fraudulent practice" means an intentional misrepresentation of facts made (a) to influence the bidding process to the detriment of Owner, (b) to establish bid prices at

artificial non-competitive levels, or (c) to deprive Owner of the benefits of free and open competition;

3. "collusive practice" means a scheme or arrangement between two or more Bidders, with or without the knowledge of Owner, a purpose of which is to establish bid prices at artificial, non-competitive levels; and
4. "coercive practice" means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the bidding process or affect the execution of the Contract.

**ARTICLE 5 – BASIS OF BID**

5.01 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 Bid items will be based on actual quantities, determined as provided in the Contract Documents.

	Description	Unit	Estimated Quantity	Bid Unit Price	Bid Price
1	Mobilization (Shall Not Exceed 3% of the Total Bid)	LS	1		
2a	Pipeline – 36” Ductile Iron Pipe	LF	7,830		
2b	Pipeline – 36” Restrained Joint Ductile Iron Pipe	LF	14,350		
2c	Pipeline – 16” Ductile Iron Pipe	LF	1,890		
2d	Pipeline – 16” Restrained Joint Ductile Iron Pipe	LF	1,310		
3a	36” Ductile Iron Fittings	LBS	262,100		
3b	16” Ductile Iron Fittings	LBS	4,700		
4a	36” Gate Valves	EA	9		
4b	16” Gate Valves	EA	3		
5a	Bore & Jack Creek Crossing – 54” Steel Casing with 36” Carrier Pipe	LF	66		
5b	Bore & Jack Roadway Crossing – 54” Steel Casing with 36” Carrier Pipe (Rocky River Road Sta 35+56.94)	LF	55		
5c	Bore & Jack Roadway Crossing – 54” Steel Casing with 36” Carrier Pipe (Goldmine Road)	LF	274		

	<b>Description</b>	<b>Unit</b>	<b>Estimated Quantity</b>	<b>Bid Unit Price</b>	<b>Bid Price</b>
5d	Bore & Jack Roadway Crossing – 54” Steel Casing with 36” Carrier Pipe (Westwood Industrial Dr)	LF	102		
5e	Bore & Jack Roadway Crossing – 54” Steel Casing with 36” Carrier Pipe (Union Power Way)	LF	62		
5f	Bore & Jack Roadway Crossing – 54” Steel Casing with 36” Carrier Pipe (Aeropointe Pkwy)	LF	130		
5g	Bore & Jack Roadway Crossing – 54” Steel Casing with 36” Carrier Pipe (Rocky River Road STA 114+39.61)	LF	61		
5h	Bore & Jack Roadway Crossing – 30” Steel Casing with 16” Carrier Pipe (Rocky River Road W/L Sta 0+15.17 – Sheet C12)	LF	67		
5i	Bore & Jack Railroad Crossing – 54” Steel Casing with 36” Carrier Pipe	LF	200		
5j	Bore & Jack Roadway Crossing – 54” Steel Casing with 36” Carrier Pipe (Old Charlotte Highway)	LF	81		
5k	Bore & Jack – 54” Steel Casing with 36” Carrier Pipe (STA 136+47.11)	LF	146		
5l	Bore & Jack – 54” Steel Casing with 36” Carrier Pipe (STA 140+39.36)	LF	265		
5m	Bore & Jack Roadway Crossing– 54” Steel Casing with 36” Carrier Pipe (US Route 74)	LF	149		
5n	Bore & Jack Roadway Crossing – 54” Steel Casing with 36” Carrier Pipe (James Hamilton Road)	LF	136		
5o	Bore & Jack Roadway Crossing – 54” Steel Casing with 36” Carrier Pipe (Chatterleigh Drive)	LF	105		
5p	Bore & Jack Roadway Crossing – 54” Steel Casing with 36” Carrier Pipe (Rocky River Road STA 228+96.13)	LF	80		

	Description	Unit	Estimated Quantity	Bid Unit Price	Bid Price
5q	Bore & Jack Roadway Crossing – 54” Steel Casing with 36” Carrier Pipe (Myers Road)	LF	66		
5r	Bore & Jack Roadway Crossing – 30” Steel Casing with 16” Carrier Pipe (Secrest Short Cut Road)	LF	57		
6a	Open Cut Crossing – 54” Steel Casing with 36” Carrier Pipe (James Hamilton Road)	LF	136		
6b	Open Cut Crossing – 54” FRP SN46 Casing with 36” Carrier Pipe	LF	90		
7	Anti-Seep Collar – 36” Pipe	EA	3		
8a	Stream/Creek Crossing w/ Matting – 16” Pipe	LF	15		
8b	Stream/Creek Crossing w/ Matting – 36” Pipe	LF	105		
8c	Stream/Creek Crossing w/ Riprap – 36” Pipe	LF	140		
8d	Stream/Creek Crossing w/ Riprap – 36” Pipe (Dry Fork Creek)	LF	20		
8e	Stream/Creek Crossing w/ Riprap – 36” Pipe (Stewarts Creek)	LF	20		
9a	Air release valve manhole for 36” Transmission Main	EA	7		
9b	Air release valve manhole for 16” Transmission Main	EA	1		
10a	Manual air release valve for 36” Transmission Main	EA	18		
10b	Manual air release valve for 16” Transmission Main	EA	6		
11a	10” Blow Off	EA	5		
11b	2” Blow Off	EA	1		
12	Connection to Existing 36” Transmission Main (STA 10+00)	LS	1		
13	Existing 16” Water Main Connection to Proposed 36” Water Main (Station 58+21)	LS	1		

	Description	Unit	Estimated Quantity	Bid Unit Price	Bid Price
14	Existing 16" Water Main Connection to Proposed 16" Water Main (W/L Station 1+01.94 – Sheet C12)	LS	1		
15	Existing 16" Water Main Connection to Proposed 36" Water Main (Station 133+03)	LS	1		
16	Existing 16" Water Main Connection to Proposed 36" Water Main (Station 165+37)	LS	1		
17	Existing 6" Water Main Connection to Proposed 16" Water Main (Station 275+95)	LS	1		
18	Existing 8" Water Main Connection to Proposed 16" Water Main (Station 284+51)	LS	1		
19a	Abandon 16" Water Main	LS	1		
19b	Abandon 8" Water Main	LS	1		
19c	Abandon 2" Water Main	LS	1		
20	Remove and Replace Existing 8" & 12" Gravity Sewer	LF	400		
21	Asphalt Pavement Removal and Replacement	SY	1,900		
22	Fire Hydrant Assembly	EA	3		
23	Short Side Water Service	EA	1		
24	Long Side Water Service	EA	1		
25a	Gravel Driveway Repair	SY	2,250		
25b	Concrete Driveway Repair	SY	380		
26	Miscellaneous Concrete	CY	20		
27	Curb & Gutter Removal and Replacement	LF	200		
28	Trench Stabilization Stone	CY	2,300		
29a	Erosion Control – Construction Entrance	EA	32		
29b	Erosion Control – Stone Outlet	EA	50		
29c	Erosion Control – Silt Fence	LF	35,855		

	Description	Unit	Estimated Quantity	Bid Unit Price	Bid Price
29d	Erosion Control – Half-ring Inlet Protection	EA	40		
29e	Erosion Control – Erosion Control Matting	SY	21,085		
29f	Erosion Control – Wattle	EA	140		
30	Pipeline Pressure Leakage Testing	LF	27,572		
31	Cleaning and Disinfection of Pipelines	LS	1		
32	Fertilizing and Seeding	LF	24,865		
33	Clearing & Grubbing	LS	1		
34	Landscaping	LS	1		
35a	Additional Restorative Planting – Lot #52	LS	1		
35b	Additional Restorative Planting – Lot #53/54	LS	1		
35c	Additional Restorative Planting – Lot #36	LS	1		
36	Magnetic Markers	LS	1		
<b>A. Total of All Unit Price Bid Items</b>					\$

5.02 A Contingency line item of 5% is to be added to the base bid. This allowance shall be used only upon issuance of a written work order by the Engineer for work not included in other items. The amount paid will be negotiated as a lump sum or unit price per each item of additional work. Any unused portion of the allowance remaining at the completion of the contract shall revert to the Owner as a credit. The Owner reserves the right to delete the allowance from the contract prior to award. Should an amount other than 5% of the subtotal be entered in the space below, the Owner reserves the right to change this amount to the correct figure.

**B. Owner Contingency Allowance, A times 5%** \$ \_\_\_\_\_

**Total Bid Price = A + B** \$ \_\_\_\_\_

\_\_\_\_\_  
(total bid price in words)

**ARTICLE 6 – TIME OF COMPLETION**

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

**ARTICLE 7 – ATTACHMENTS TO THIS BID**

- 7.01 The following documents are submitted with and made a condition of this Bid:
  - A. Required Bid security;
  - B. List of Proposed Subcontractors;
  - C. List of Proposed Suppliers;
  - D. List of Project References;
  - E. Evidence of authority to do business in the state of the Project; or a written covenant to obtain such license within the time for acceptance of Bids;
  - F. Contractor’s License No.:
  - G. Required Bidder Qualification Statement with supporting data

**ARTICLE 8 – DEFINED TERMS**

- 8.01 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 9 – BID SUBMITTAL**

BIDDER: *[Indicate correct name of bidding entity]*

\_\_\_\_\_  
By:  
*[Signature]* \_\_\_\_\_

*[Printed name]* \_\_\_\_\_  
*(If Bidder is a corporation, a limited liability company, a partnership, or a joint venture, attach evidence of authority to sign.)*

Attest:  
*[Signature]* \_\_\_\_\_

*[Printed name]* \_\_\_\_\_

Title: \_\_\_\_\_

Submittal Date: \_\_\_\_\_

Address for giving notices:  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Telephone Number: \_\_\_\_\_

Fax Number: \_\_\_\_\_

Contact Name and e-mail address: \_\_\_\_\_  
\_\_\_\_\_

Bidder's License No.: \_\_\_\_\_  
*(where applicable)*



**BID BOND**

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

BIDDER *(Name and Address):*

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

OWNER *(Name and Address):*

Union County  
500 N. Main Street  
Monroe, NC 28112

BID

Bid Due Date:  
Description *(Project Name and Include Location):*

BOND

Bond Number:  
Date *(Not earlier than Bid due date):*  
Penal sum \_\_\_\_\_

(Words)

\$

(Figures)

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

**BIDDER**

**SURETY**

(Seal)

(Seal)

\_\_\_\_\_  
Bidder's Name and Corporate Seal

\_\_\_\_\_  
Surety's Name and Corporate Seal

By:

By:

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Signature (Attach Power of Attorney)

\_\_\_\_\_  
Print Name

\_\_\_\_\_  
Print Name

\_\_\_\_\_  
Title

\_\_\_\_\_  
Title

Attest:

Attest:

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Title

\_\_\_\_\_  
Title

*Note: Above addresses are to be used for giving any required notice. Provide execution by any additional parties, such as joint venturers, if necessary.*

1. Bidder and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to pay to Owner upon default of Bidder the penal sum set forth on the face of this Bond. Payment of the penal sum is the extent of Bidder's and Surety's liability. Recovery of such penal sum under the terms of this Bond shall be Owner's sole and exclusive remedy upon default of Bidder.
2. Default of Bidder shall occur 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 shall 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 shall not in the aggregate exceed 120 days from Bid due date without Surety's written consent.
6. No suit or action shall 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 Bid due date.
7. Any suit or action under this Bond shall be commenced only in a court of competent jurisdiction located in the state in which the Project is located.
8. Notices required hereunder shall 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 Registered or Certified Mail, return receipt requested, postage pre-paid, and shall 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 shall 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 shall govern and the remainder of this Bond that is not in conflict therewith shall continue in full force and effect.
11. The term "Bid" as used herein includes a Bid, offer, or proposal as applicable.

# Notice of Award

Date: \_\_\_\_\_

Project: \_\_\_\_\_

Owner: **UNION COUNTY**

Owner's Contract No.: \_\_\_\_\_

Contract: \_\_\_\_\_

Engineer's Project No.: \_\_\_\_\_

Bidder: \_\_\_\_\_

Bidder's Address: *[send Notice of Award Certified Mail, Return Receipt Requested]*

You are notified that your Bid dated \_\_\_ for the above Contract has been considered. You are the Successful Bidder and are awarded a Contract for

*[Indicate total Work, alternates, or sections of Work awarded.]*

The Contract Price of your Contract is \_\_\_\_\_ Dollars (\$\_\_\_).

*[Insert appropriate data if unit prices are used. Change language for cost-plus contracts.]*

\_\_\_ copies of the proposed Contract Documents (except Drawings) accompany this Notice of Award.

\_\_\_ sets of the Drawings will be delivered separately or otherwise made available to you immediately.

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

1. Deliver to the Owner five (5) fully executed counterparts of the Contract Documents.
2. Deliver with the executed Contract Documents the Contract security [Bonds] as specified in the Instructions to Bidders (Article 20) and General Conditions (Paragraph 5.01)

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 thirty (30) days after you comply with the above conditions, Owner will return to you one fully executed counterpart of the Contract Documents.

\_\_\_\_\_  
Scott Huneycutt, PE for **UNION COUNTY**

Owner

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

Authorized Signature

\_\_\_\_\_  
Engineering Division Director

Title

Copy to Engineer



**SUGGESTED FORM OF AGREEMENT  
BETWEEN OWNER AND CONTRACTOR  
FOR CONSTRUCTION CONTRACT (STIPULATED PRICE)**

THIS AGREEMENT is by and between \_\_\_\_\_ UNION COUNTY \_\_\_\_\_ (“Owner”) and  
\_\_\_\_\_  
\_\_\_\_\_ (“Contractor”).

Owner and Contractor hereby agree as follows:

**ARTICLE 1 – WORK**

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

Furnish and install approximately 24,300 LF of 36” ductile iron water transmission pipeline and approximately 3,200 LF of 16” ductile iron water transmission pipeline along N. Rocky River Road and Secrest Short Cut Road in Union County including all associated fittings, valves, air release valve structures, blow-offs, tie-ins, interconnections, services, clearing, erosion control, cleaning, disinfection and testing, pipeline abandonment; and all other pipeline work shown on the Drawings and described in the Specifications.

**ARTICLE 2 – THE PROJECT**

2.01 The Project for which the Work under the Contract Documents may be the whole or only a part is generally described as follows:

**853 Zone Improvements Phase I Transmission Mains**

**ARTICLE 3 – ENGINEER**

3.01 The Project has been designed by **Black & Veatch International Company**, (Engineer), which is to act as Owner’s representative, assume all duties and responsibilities, and have the rights and authority assigned to Engineer in the Contract Documents in connection with the completion of the Work in accordance with the Contract Documents.

**ARTICLE 4 – CONTRACT TIMES**

4.01 *Time of the Essence*

A. All time limits for Milestones, if any, Substantial Completion, and completion and readiness for final payment as stated in the Contract Documents are of the essence of the Contract.

4.02 *Days to Achieve Substantial Completion and Final Payment*

~~A. The Work will be substantially completed on or before XXX, and completed and ready for final payment in accordance with Paragraph 14.07 of the General Conditions on or before XXX.~~

~~for~~

- B. The Work will be substantially completed within **500** days after the date when the Contract Times commence to run as provided in Paragraph 2.03 of the General Conditions and completed and ready for final payment in accordance with Paragraph 14.07 of the General Conditions within **540** days after the date when the Contract Times commence to run.

#### 4.03 *Liquidated Damages*

- A. Contractor and Owner recognize that time is of the essence as stated in Paragraph 4.01 above and that Owner will suffer financial loss if the Work is not completed within the times specified in Paragraph 4.02 above, plus any extensions thereof allowed in accordance with Article 12 of the General Conditions. The parties also recognize the delays, expense, and difficulties involved in proving in a legal ~~or arbitration~~ proceeding the actual loss suffered by Owner if the Work is not completed on time. Accordingly, instead of requiring any such proof, Owner and Contractor agree that as liquidated damages for delay (but not as a penalty), Contractor shall pay Owner **\$2,000** for each day that expires after the time specified in Paragraph 4.02 above for Substantial Completion until the Work is substantially complete. After Substantial Completion, if Contractor shall neglect, refuse, or fail to complete the remaining Work within the Contract Time or any proper extension thereof granted by Owner, Contractor shall pay Owner **\$500** for each day that expires after the time specified in Paragraph 4.02 above for completion and readiness for final payment until the Work is completed and ready for final payment.
- B. **In addition to liquidated damages, Contractor shall reimburse Owner all fees and costs paid to or incurred by Engineer in administering the construction of the Project beyond the time specified in Paragraph 4.02 above for Substantial Completion. All fees and costs may be deducted from monies due Contractor for the performance of the Work.**

### ARTICLE 5 – CONTRACT PRICE

5.02 Owner shall pay Contractor for completion of the Work in accordance with the Contract Documents an amount in current funds equal to the sum of the amounts determined pursuant to Paragraphs 5.01.A, 5.01.B, and 5.01.C below:

- A. ~~For all Work other than Unit Price Work, a lump sum of: \$ \_\_\_\_\_~~

~~All specific cash allowances are included in the above price in accordance with Paragraph 11.02 of the General Conditions.~~

- B. For all Unit Price Work, an amount equal to the sum of the established unit price for each separately identified item of Unit Price Work times the actual quantity of that ~~item: item. Unit Prices are as specified in Contractor's Bid.~~ Amounts expended pursuant to this Agreement shall not exceed \_\_\_\_\_ Dollars (\$ \_\_\_\_\_) without written amendment hereto duly executed by both parties.



**UNIT PRICE WORK**

<b><u>Item No.</u></b>	<b><u>Description</u></b>	<b><u>Unit</u></b>	<b><u>Estimated Quantity</u></b>	<b><u>Bid Unit Price</u></b>	<b><u>Bid Price</u></b>
------------------------	---------------------------	--------------------	----------------------------------	------------------------------	-------------------------

**Total of all Bid Prices (Unit Price Work)** \$ \_\_\_\_\_

The Bid prices for Unit Price Work set forth as of the Effective Date of the Agreement are based on estimated quantities. As provided in Paragraph 11.03 of the General Conditions, estimated quantities are not guaranteed, and determinations of actual quantities and classifications are to be made by Engineer as provided in Paragraph 9.06 of the General Conditions.

C. 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 14 of the General Conditions. Applications for Payment will be processed by Engineer as provided in the General Conditions. **Owner shall make payments within thirty (30) days after presentation of the Application for Payment to Owner by Engineer with Engineer’s recommendation for payment.**

6.02 *Progress Payments; Retainage*

A. Owner shall make **monthly** progress payments on account of the Contract Price on the basis of Contractor’s Applications for Payment ~~on or about the \_\_\_\_\_ day of each month~~ during performance of the Work as provided in Paragraph 6.02.A.1 below. All such payments will be measured by the schedule of values established as provided in Paragraph 2.07.A of the General Conditions (and in the case of Unit Price Work based on the number of units completed) or, in the event there is no schedule of values, as provided in the General Requirements.

1. Prior to Substantial Completion, progress payments will be made in an amount equal to the percentage indicated below but, in each case, less the aggregate of payments previously made and less such amounts as Engineer may determine or Owner may withhold, including but not limited to liquidated damages, in accordance with Paragraph 14.02 of the General Conditions.

a. **95%** percent of Work completed (with the balance being retainage). If the Work has been 50 percent completed as determined by Engineer, and if the character and progress of the Work have been satisfactory to Owner and Engineer, then as long as the character

and progress of the Work remain satisfactory to Owner and Engineer, there will be no additional retainage; and

- b. **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 as Engineer shall determine in accordance with Paragraph 14.02.B.5 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 tentative list of items to be completed or corrected attached to the certificate of Substantial Completion.

### 6.03 *Final Payment*

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

## **ARTICLE 7 – INTEREST**

7.01 All moneys not paid when due as provided in Article 14 of the General Conditions shall bear interest at the rate of **4%** percent per annum.

## **ARTICLE 8 – CONTRACTOR'S REPRESENTATIONS**

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

- A. Contractor has examined and carefully studied the Contract Documents and the other related data identified in the Bidding Documents.
- B. Contractor has visited the Site and become familiar with and is satisfied as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work.
- C. Contractor is familiar with and is satisfied as to all federal, state, and local Laws and Regulations that may affect cost, progress, and performance of the Work.
- D. Contractor has carefully studied all: (1) reports of explorations and tests of subsurface conditions at or contiguous to the Site and all drawings of physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities), if any, that have been identified in Paragraph SC-4.02 of the Supplementary Conditions as containing reliable "technical data," and (2) reports and drawings of Hazardous Environmental Conditions, if any, at the Site that have been identified in Paragraph SC-4.06 of the Supplementary Conditions as containing reliable "technical data."
- E. Contractor has considered the information known to Contractor; information commonly known to contractors doing business in the locality of the Site; information and observations obtained

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

- F. Based on the information and observations referred to in Paragraph 8.01.E above, Contractor does not consider that further examinations, investigations, explorations, tests, studies, or data are necessary for the performance of the Work at the Contract Price, within the Contract Times, and in accordance with the other terms and conditions of the Contract Documents.
- G. Contractor is aware of the general nature of work to be performed by Owner and others at the Site that relates to the Work as indicated in the Contract Documents.
- H. Contractor has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Contractor has discovered in the Contract Documents, and the written resolution thereof by Engineer is acceptable to Contractor.
- I. The Contract Documents are **generally** sufficient to indicate and convey **an** understanding of all terms and conditions for performance and furnishing of the Work.

## ARTICLE 9 – CONTRACT DOCUMENTS

### 9.01 *Contents*

- A. The Contract Documents consist of the following:
  - 1. This Agreement (pages 1 to 8, inclusive).
  - 2. Performance bond (pages 1 to 3, inclusive).
  - 3. Payment bond (pages 1 to 3, inclusive).
  - 4. Other bonds (pages \_\_\_\_\_ to \_\_\_\_\_, inclusive).
    - a. \_\_\_\_\_ (pages \_\_\_\_\_ to \_\_\_\_\_, inclusive).
    - b. \_\_\_\_\_ (pages \_\_\_\_\_ to \_\_\_\_\_, inclusive).
    - c. \_\_\_\_\_ (pages \_\_\_\_\_ to \_\_\_\_\_, inclusive).
  - 5. General Conditions (pages 1 to 74, inclusive).
  - 6. Supplementary Conditions (pages 1 to 5, inclusive).
  - 7. Specifications as listed in the table of contents of the Project Manual.

8. Drawings consisting of \_\_\_\_\_ sheets with each sheet bearing the following general title: Union County Public Works 853W Zone Improvements Phase 1 Transmission Mains [or] the Drawings listed on attached sheet index. **Drawings are separately bound and therefore not attached to this Agreement.**
  9. Addenda (numbers \_\_\_\_\_ to \_\_\_\_\_, inclusive).
  10. Exhibits to this Agreement (enumerated as follows):
    - a. Contractor's Bid (pages \_\_\_\_\_ to \_\_\_\_\_, inclusive).
    - b. Documentation submitted by Contractor prior to Notice of Award (pages \_\_\_\_\_ to \_\_\_\_\_, inclusive).
    - c. *[List other required attachments (if any), such as documents required by funding or lending agencies].*
  11. The following which may be delivered or issued on or after the Effective Date of the Agreement and are not attached hereto:
    - a. Notice to Proceed (pages \_\_\_\_\_ to \_\_\_\_\_, inclusive).
    - b. Work Change Directives.
    - c. Change Orders.
- B. The documents listed in Paragraph 9.01.A are attached to this Agreement (except as expressly noted otherwise above).
- C. There are no Contract Documents other than those listed above in this Article 9.
- D. The Contract Documents may only be amended, modified, or supplemented as provided in Paragraph 3.04 of the General Conditions.

## **ARTICLE 10 – MISCELLANEOUS**

### 10.01 *Terms*

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

### 10.02 *Assignment of Contract*

- A. No assignment by a party hereto of any rights under or interests in the Contract will be binding on another party hereto without the written consent of the party sought to be bound; and, specifically but without limitation, moneys that may become due and moneys that are due may not be assigned without such consent (except to the extent that the effect of this restriction may be limited by law), and unless specifically stated to the contrary in any written consent to an

assignment, no assignment will release or discharge the assignor from any duty or responsibility under the Contract Documents.

#### 10.03 *Successors and Assigns*

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

#### 10.04 *Severability*

- A. Any provision or part of the Contract Documents held to be void or unenforceable under any Law or Regulation shall be deemed stricken, and all remaining provisions shall continue to be valid and binding upon Owner and Contractor, who agree that the Contract Documents shall be reformed to replace such stricken provision or part thereof with a valid and enforceable provision that comes as close as possible to expressing the intention of the stricken provision.

#### 10.05 *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 10.05:
  - 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.

IN WITNESS WHEREOF, Owner and Contractor have signed this Agreement. Counterparts have been delivered to Owner and Contractor. All portions of the Contract Documents have been signed or have been identified by Owner and Contractor or on their behalf.

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

OWNER:

UNION COUNTY

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

Title: County Manager

Attest: \_\_\_\_\_

Title: \_\_\_\_\_

Address for giving notices:

500 N. Main Street

Suite 600

Monroe, NC 28112

CONTRACTOR

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

Title: \_\_\_\_\_

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

Attest: \_\_\_\_\_

Title: \_\_\_\_\_

Address for giving notices:

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

License No.: \_\_\_\_\_

(Where applicable)

Agent for service of process:

\_\_\_\_\_

# Notice to Proceed

Date: \_\_\_\_\_

Project: 853W Zone Improvements – Phase I Transmission Mains

Owner: **UNION COUNTY**

Owner's Contract No.: WT-061

Contract:

Engineer's Project No.: 186110

Contractor:

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

You are notified that the Contract Times under the above Contract will commence to run on \_\_\_\_\_. On or before that date, you are to start performing your obligations under the Contract Documents. In accordance with Article 4 of the Agreement, the date of Substantial Completion is \_\_\_\_\_, and the date of readiness for final payment is \_\_\_\_\_ [(or) the number of days to achieve Substantial Completion is \_\_\_\_\_, and the number of days to achieve readiness for final payment is \_\_\_\_\_].

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

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

\_\_\_\_\_ *[add other requirements].*

**UNION COUNTY**

Owner

Given by:

Authorized Signature

Title

Date

Copy to Engineer





# PERFORMANCE BOND

CONTRACTOR (name and address):

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

OWNER (name and address): **UNION COUNTY**

500 N. Main Street, Suite 600  
Monroe, North Carolina, 28112

CONSTRUCTION CONTRACT

Effective Date of the Agreement:

Amount:

Description (name and location):

BOND

Bond Number:

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

Amount:

Modifications to this Bond Form: None See Paragraph 16

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

**CONTRACTOR AS PRINCIPAL**

**SURETY**

\_\_\_\_\_  
(seal)

Contractor's Name and Corporate Seal

\_\_\_\_\_  
(seal)

Surety's Name and Corporate Seal

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

Signature

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

Signature (attach power of attorney)

\_\_\_\_\_  
Print Name

\_\_\_\_\_  
Print Name

\_\_\_\_\_  
Title

\_\_\_\_\_  
Title

Attest: \_\_\_\_\_

Signature

Attest: \_\_\_\_\_

Signature

\_\_\_\_\_  
Title

\_\_\_\_\_  
Title

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

SAMPLE

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

14. Definitions

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

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

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

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

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

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

16. Modifications to this Bond are as follows:

# PAYMENT BOND

CONTRACTOR (name and address):

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

OWNER (name and address): **UNION COUNTY**  
500 N. Main Street, Suite 600  
Monroe, North Carolina 28112

CONSTRUCTION CONTRACT  
Effective Date of the Agreement:  
Amount:  
Description (name and location):

BOND  
Bond Number:  
Date (not earlier than the Effective Date of the Agreement of the Construction Contract):  
Amount:  
Modifications to this Bond Form: None See Paragraph 18

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

**CONTRACTOR AS PRINCIPAL**

**SURETY**

\_\_\_\_\_  
Contractor's Name and Corporate Seal (seal)

\_\_\_\_\_  
Surety's Name and Corporate Seal (seal)

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

By: \_\_\_\_\_  
Signature (attach power of attorney)

\_\_\_\_\_  
Print Name

\_\_\_\_\_  
Print Name

\_\_\_\_\_  
Title

\_\_\_\_\_  
Title

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

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

\_\_\_\_\_  
Title

\_\_\_\_\_  
Title

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

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

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

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

#### 16. Definitions

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

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

16.2 **Claimant:** An individual or entity having a direct contract with the Contractor or with a subcontractor of the Contractor to furnish labor, materials, or equipment for use in the performance of the Construction Contract. The term Claimant also

includes any individual or entity that has rightfully asserted a claim under an applicable mechanic's lien or similar statute against the real property upon which the Project is located. The intent of this Bond shall be to include without limitation in the terms of "labor, materials, or equipment" that part of the water, gas, power, light, heat, oil, gasoline, telephone service, or rental equipment used in the Construction Contract, architectural and engineering services required for performance of the work of the Contractor and the Contractor's subcontractors, and all other items for which a mechanic's lien may be asserted in the jurisdiction where the labor, materials, or equipment were furnished.

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

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

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

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

18. Modifications to this Bond are as follows:

















# Certificate of Substantial Completion

Project: 853W Zone Improvements – Phase I Transmission Mains

Owner: **UNION COUNTY**

Owner's Contract No.: WT-061

Contract:

Engineer's Project No.: 186110

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

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

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\_\_\_\_\_  
Date of Substantial Completion

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

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

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

- Amended Responsibilities                       Not Amended

Owner's Amended Responsibilities:

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Contractor's Amended Responsibilities:

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

**This document has been modified by Owner. Changes are shown in bold text with additions underlined and deletions struck through. The Table of Contents has been updated to reflect modifications.**

# STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

Prepared by

**ENGINEERS JOINT CONTRACT DOCUMENTS COMMITTEE**

and

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Endorsed by



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

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**STANDARD GENERAL CONDITIONS OF THE  
CONSTRUCTION CONTRACT**

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## ARTICLE 1 – DEFINITIONS AND TERMINOLOGY

### 1.01 *Defined Terms*

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

negotiations, representations, or agreements, whether written or oral. **The Contract may not be modified or altered except by a writing signed by both the Owner and Contractor.**

12. *Contract Documents*—Those items so designated in the Agreement. Only printed or hard copies of the items listed in the Agreement are Contract Documents. Approved Shop Drawings, other Contractor submittals, and the reports and drawings of subsurface and physical conditions are not Contract Documents.
13. *Contract Price*—The moneys payable by Owner to Contractor for completion of the Work in accordance with the Contract Documents as stated in the Agreement (subject to the provisions of Paragraph 11.03 in the case of Unit Price Work).
14. *Contract Times*—The number of days or the dates stated in the Agreement to: (i) achieve Milestones, if any; (ii) achieve Substantial Completion; and (iii) complete the Work so that it is ready for final payment as evidenced by Engineer's written recommendation of final payment.
15. *Contractor*—The individual or entity with whom Owner has entered into the Agreement.
16. *Cost of the Work*—See Paragraph 11.01 for definition.
17. *Drawings*—That part of the Contract Documents prepared or approved by Engineer which graphically shows the scope, extent, and character of the Work to be performed by Contractor. Shop Drawings and other Contractor submittals are not Drawings as so defined.
18. *Effective Date of the Agreement*—The date indicated in the Agreement on which it becomes effective, but if no such date is indicated, it means the date on which the Agreement is signed and delivered by the last of the two parties to sign and deliver.
19. *Engineer*—The individual or entity named as such in the Agreement.
20. *Field Order*—A written order issued by Engineer which requires minor changes in the Work but which does not involve a change in the Contract Price or the Contract Times.
21. *General Requirements*—~~Sections of~~ Division 1 of the Specifications.
22. *Hazardous Environmental Condition*—The presence at the Site of Asbestos, PCBs, Petroleum, Hazardous Waste, or Radioactive Material in such quantities or circumstances that may present a substantial danger to persons or property exposed thereto.
23. *Hazardous Waste*—The term Hazardous Waste shall have the meaning provided in Section 1004 of the Solid Waste Disposal Act (42 USC Section 6903) as amended from time to time.
24. *Laws and Regulations; Laws or Regulations*—Any and all applicable laws, rules, regulations, ordinances, codes, and orders of any and all governmental bodies, agencies, authorities, and courts having jurisdiction.
25. *Liens*—Charges, security interests, or encumbrances upon Project funds, real property, or personal property.



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

39. *Schedule of Values*—A schedule, prepared and maintained by Contractor, allocating portions of the Contract Price to various portions of the Work and used as the basis for reviewing Contractor’s Applications for Payment.
40. *Shop Drawings*—All drawings, diagrams, illustrations, schedules, and other data or information which are specifically prepared or assembled by or for Contractor and submitted by Contractor to illustrate some portion of the Work.
41. *Site*—Lands or areas indicated in the Contract Documents as being furnished by Owner upon which the Work is to be performed, including rights-of-way and easements for access thereto, and such other lands furnished by Owner which are designated for the use of Contractor.
42. *Specifications*—That part of the Contract Documents consisting of written requirements for materials, equipment, systems, standards and workmanship as applied to the Work, and certain administrative requirements and procedural matters applicable thereto.
43. *Subcontractor*—An individual or entity having a direct contract with Contractor or with any other Subcontractor for the performance of a part of the Work at the Site.
44. *Substantial Completion*—The time at which the Work (or a specified part thereof) has progressed to the point where, in the opinion of Engineer, the Work (or a specified part thereof) is sufficiently complete, in accordance with the Contract Documents, so that the Work (or a specified part thereof) can be utilized **or occupied** for the purposes for which it is intended. The terms “substantially complete” and “substantially completed” as applied to all or **a specified** part of the Work refer to Substantial Completion thereof.
45. *Successful Bidder*—The Bidder submitting a responsive Bid to whom Owner makes an award.
46. *Supplementary Conditions*—That part of the Contract Documents which amends or supplements these General Conditions.
47. *Supplier*—A manufacturer, fabricator, supplier, distributor, materialman, or vendor having a direct contract with Contractor or with any Subcontractor to furnish materials or equipment to be incorporated in the Work by Contractor or Subcontractor.
48. *Underground Facilities*—All underground pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels, or other such facilities or attachments, and any encasements containing such facilities, including those that convey electricity, gases, steam, liquid petroleum products, telephone or other communications, cable television, water, wastewater, storm water, other liquids or chemicals, or traffic or other control systems.
49. *Unit Price Work*—Work to be paid for on the basis of unit prices.
50. *Work*—The entire construction or the various separately identifiable parts thereof required to be provided under the Contract Documents. Work includes and is the result of performing or providing all labor, services, and documentation necessary to produce such construction, and

furnishing, installing, and incorporating all materials and equipment into such construction, all as required by the Contract Documents.

51. *Work Change Directive*—A written statement to Contractor issued on or after the Effective Date of the Agreement and signed by Owner and recommended by Engineer ordering an addition, deletion, or revision in the Work, or responding to differing or unforeseen subsurface or physical conditions under which the Work is to be performed or to emergencies. A Work Change Directive will not change the Contract Price or the Contract Times but is evidence that the parties expect that the change ordered or documented by a Work Change Directive will be incorporated in a subsequently issued Change Order following negotiations by the parties as to its effect, if any, on the Contract Price or Contract Times.

## 1.02 *Terminology*

- A. The words and terms discussed in Paragraph 1.02.B through F are not defined but, when used in the Bidding Requirements or Contract Documents, have the indicated meaning.

- B. *Intent of Certain Terms or Adjectives:*

1. The Contract Documents include the terms “as allowed,” “as approved,” “as ordered,” “as directed” or terms of like effect or import to authorize an exercise of professional judgment by Engineer. In addition, the adjectives “reasonable,” “suitable,” “acceptable,” “proper,” “satisfactory,” or adjectives of like effect or import are used to describe an action or determination of Engineer as to the Work. It is intended that such exercise of professional judgment, action, or determination will be solely to evaluate, in general, the Work for compliance with the information in the Contract Documents and with the design concept of the Project as a functioning whole as shown or indicated in the Contract Documents (unless there is a specific statement indicating otherwise). The use of any such term or adjective is not intended to and shall not be effective to assign to Engineer any duty or authority to supervise or direct the performance of the Work, or any duty or authority to undertake responsibility contrary to the provisions of Paragraph 9.09 or any other provision of the Contract Documents.

- C. *Day:*

1. The word “day” means a calendar day of 24 hours measured from midnight to the next midnight.

- D. *Defective:*

1. The word “defective,” when modifying the word “Work,” refers to Work that is unsatisfactory, faulty, or deficient in that it:
  - a. does not conform to the Contract Documents; or
  - b. does not meet the requirements of any applicable inspection, reference standard, test, or approval referred to in the Contract Documents; or

- c. has been damaged prior to Engineer's recommendation of final payment (unless responsibility for the protection thereof has been assumed by Owner at Substantial Completion in accordance with Paragraph 14.04 or 14.05).

E. *Furnish, Install, Perform, Provide:*

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

## ARTICLE 2 – PRELIMINARY MATTERS

### 2.01 *Delivery of Bonds and Evidence of Insurance*

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

### 2.02 *Copies of Documents*

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

### 2.03 *Commencement of Contract Times; Notice to Proceed*

- A. The Contract Times will commence to run ~~on the thirtieth day after the Effective Date of the Agreement or, if a Notice to Proceed is given,~~ on the day indicated in the Notice to Proceed. A Notice to Proceed may be given at any time within 30 days after the Effective Date of the

Agreement. ~~In no event will the Contract Times commence to run later than the sixtieth day after the day of Bid opening or the thirtieth day after the Effective Date of the Agreement, whichever date is earlier.~~

2.04 *Starting the Work*

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

2.05 *Before Starting Construction*

- A. *Preliminary Schedules:* Within 10 days after the Effective Date of the Agreement (unless otherwise specified in the General Requirements), Contractor shall submit to Engineer for timely review:
1. a preliminary Progress Schedule indicating the times (numbers of days or dates) for starting and completing the various stages of the Work, including any Milestones specified in the Contract Documents;
  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.

2.06 *Preconstruction Conference; Designation of Authorized Representatives*

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

2.07 *Initial Acceptance of Schedules*

- A. At least 10 days before submission of the first Application for Payment a conference attended by Contractor, Engineer, and others as appropriate will be held to review for acceptability to Engineer as provided below the ~~schedules~~ **Progress Schedule** submitted in accordance with Paragraph 2.05.A. Contractor shall have an additional 10 days to make corrections and

adjustments and to complete and resubmit the ~~schedules.~~ Progress Schedule. No progress payment shall be made to Contractor until an acceptable ~~schedules are~~ Project Schedule is submitted to Engineer.

1. The Progress Schedule will be acceptable to Engineer if it provides an orderly progression of the Work to completion within the Contract Times. Such acceptance will not impose on Engineer responsibility for the Progress Schedule, for sequencing, scheduling, or progress of the Work, nor interfere with or relieve Contractor from Contractor's full responsibility therefor.
2. Contractor's Schedule of Submittals will be acceptable to Engineer if it provides a workable arrangement for reviewing and processing the required submittals.
3. Contractor's Schedule of Values will be acceptable to Engineer as to form and substance if it provides a reasonable allocation of the Contract Price to component parts of the Work.

### ARTICLE 3 – CONTRACT DOCUMENTS: INTENT, AMENDING, REUSE

#### 3.01 *Intent*

- A. The Contract Documents are ~~complementary;~~ fully-integrated; what is required by ~~one each~~ document which is part of the Contract Documents is as binding as if required ~~by~~ or set forth in all of the Contract Documents.
- B. It is the intent of the Contract Documents to describe a functionally complete ~~project~~ Project (or part thereof) to be constructed in accordance with the Contract Documents. Any labor, documentation, services, materials, or equipment that reasonably may be inferred from the Contract Documents or from prevailing custom or trade usage as being required to produce the indicated result will be provided whether or not specifically called for, at no additional cost to Owner.
- C. Clarifications and interpretations of the Contract Documents shall be issued by Engineer as provided in Article 9.

#### 3.02 *Reference Standards*

- A. Standards, Specifications, Codes, Laws, and Regulations
  1. Reference to standards, specifications, manuals, or codes of any technical society, organization, or association, or to Laws or Regulations, whether such reference be specific or by implication, shall mean the standard, specification, manual, code, or Laws or Regulations in effect at the time of opening of Bids (or on the Effective Date of the Agreement if there were no Bids), except as may be otherwise specifically stated in the Contract Documents.
  2. No provision of any such standard, specification, manual, or code, or any instruction of a Supplier, shall be effective to change the duties or responsibilities of Owner, Contractor, or Engineer, or any of their subcontractors, consultants, agents, or employees, from those set forth in the Contract Documents. No such provision or instruction shall be effective to assign

to Owner, Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, any duty or authority to supervise or direct the performance of the Work or any duty or authority to undertake responsibility inconsistent with the provisions of the Contract Documents.

### 3.03 *Reporting and Resolving Discrepancies*

#### A. *Reporting Discrepancies:*

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

### 3.04 *Amending and Supplementing Contract Documents*

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

### 3.05 *Reuse of Documents*

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

### 3.06 *Electronic Data*

- A. Unless otherwise stated in the Supplementary Conditions, the data furnished by Owner or Engineer to Contractor, or by Contractor to Owner or Engineer, that may be relied upon are limited to the printed copies (also known as hard copies). Files in electronic media format of text, data, graphics, or other types are furnished only for the convenience of the receiving party. Any conclusion or information obtained or derived from such electronic files will be at the user's sole risk. If there is a discrepancy between the electronic files and the hard copies, the hard copies govern.
- B. Because data stored in electronic media format can deteriorate or be modified inadvertently or otherwise without authorization of the data's creator, the party receiving electronic files agrees that it will perform acceptance tests or procedures within 60 days, after which the receiving party shall be deemed to have accepted the data thus transferred. Any errors detected within the 60-day acceptance period will be corrected by the transferring party.



- C. When transferring documents in electronic media format, the transferring party makes no representations as to long term compatibility, usability, or readability of documents resulting from the use of software application packages, operating systems, or computer hardware differing from those used by the data's creator.

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

4.01 *Availability of Lands*

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

4.02 *Subsurface and Physical Conditions*

- A. *Reports and Drawings:* The Supplementary Conditions identify:
  - 1. those reports known to Owner of explorations and tests of subsurface conditions at or contiguous to the Site; and
  - 2. those drawings known to Owner of physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities).
- B. *Limited Reliance by Contractor on Technical Data Authorized:* Contractor may rely upon the accuracy of the "technical data" contained in such reports and drawings, but such reports and drawings are not Contract Documents. Such "technical data" is identified in the Supplementary Conditions. Except for such reliance on such "technical data," Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors with respect to:
  - 1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor, and safety precautions and programs incident thereto; or

2. other data, interpretations, opinions, and information contained in such reports or shown or indicated in such drawings; or
3. any Contractor interpretation of or conclusion drawn from any “technical data” or any such other data, interpretations, opinions, or information.

C. **Site Visit: Contractor represents that is has visited the Site and has become familiar with and satisfied as to the general, local, and Site conditions that may affect cost, progress, performance, and furnishing of the Work.**

4.03 *Differing Subsurface or Physical Conditions*

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

then Contractor shall, **promptly within twenty-four (24) hours** after becoming aware thereof and before further disturbing the subsurface or physical conditions or performing any Work in connection therewith (except in an emergency as required by Paragraph 6.16.A), notify Owner and Engineer in writing about such condition. Contractor shall not further disturb such condition or perform any Work in connection therewith (except as aforesaid) until receipt of written order to do so.

- B. *Engineer’s Review:* After receipt of written notice as required by Paragraph 4.03.A, Engineer **will promptly shall within seven (7) calendar days** review the pertinent condition, determine the necessity of Owner’s obtaining additional exploration or tests with respect thereto, and advise Owner in writing (with a copy to Contractor) of Engineer’s findings and conclusions.

C. *Possible Price and Times Adjustments:*

1. The Contract Price or the Contract Times, or both, will be equitably adjusted to the extent that the existence of such differing subsurface or physical condition causes an increase or decrease in Contractor’s cost of, or time required for, performance of the Work; subject, however, to the following:
  - a. such condition must meet any one or more of the categories described in Paragraph 4.03.A; and

- b. with respect to Work that is paid for on a unit price basis, any adjustment in Contract Price will be subject to the provisions of Paragraphs ~~9.07~~ 9.06 and 11.03; and
  - c. Contractor shall not be entitled to, and Owner shall not be liable for, any remobilization fees or equipment charges as a result of any work stoppage pursuant to Paragraph 4.03.
2. Contractor shall not be entitled to any adjustment in the Contract Price or Contract Times if:
    - a. Contractor knew of the existence of such conditions at the time Contractor made a final commitment to Owner with respect to Contract Price and Contract Times by the submission of a Bid or becoming bound under a negotiated contract; or
    - b. the existence of such condition could reasonably have been discovered or revealed as a result of any examination, investigation, exploration, test, or study of the Site and contiguous areas required by the Bidding Requirements or Contract Documents to be conducted by or for Contractor prior to Contractor's making such final commitment; or
    - c. Contractor failed to give the written notice as required by Paragraph 4.03.A.
  3. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times, or both, a Claim may be made therefor as provided in Paragraph 10.05. However, neither Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors shall be liable to Contractor for any claims, costs, losses, or damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by Contractor on or in connection with any other project or anticipated project.

#### 4.04 *Underground Facilities*

- A. *Shown or Indicated:* The information, and data, and locations shown or indicated in the Contract Documents with respect to existing Underground Facilities at or contiguous to the Site is based on information and data furnished to Owner or Engineer by the owners of such Underground Facilities, including Owner, or by others. Unless it is otherwise expressly provided in the Supplementary Conditions:
  1. Owner and Engineer shall not be responsible for the accuracy or completeness of any such information or data provided by others; and
  2. the cost of all of the following will be included in the Contract Price, and Contractor shall have full responsibility for:
    - a. reviewing and checking all such information and data;
    - b. locating all Underground Facilities shown or indicated in the Contract Documents;

- c. coordination of the Work with the owners of such Underground Facilities, including Owner, during construction; and
- d. the safety and protection of all such Underground Facilities and repairing any damage thereto resulting from the Work.

B. *Not Shown or Indicated:*

1. If an Underground Facility is uncovered or revealed at or contiguous to the Site which was not shown or indicated, or not shown or indicated with reasonable accuracy in the Contract Documents, Contractor shall, **promptly within twenty-four (24) hours** after becoming aware thereof and before further disturbing conditions affected thereby or performing any Work in connection therewith (except in an emergency as required by Paragraph 6.16.A), identify the owner of such Underground Facility and give written notice to that owner and to Owner and Engineer. Engineer ~~will promptly~~ **shall within forty-eight (48) hours** review the Underground Facility and determine the extent, if any, to which a change is required in the Contract Documents to reflect and document the consequences of the existence or location of the Underground Facility. During such time, Contractor shall be responsible for the safety and protection of such Underground Facility.
2. If Engineer concludes that a change in the Contract Documents is required, a Work Change Directive or a Change Order will be issued to reflect and document such ~~consequences.~~ **change.** An equitable adjustment shall be made in the Contract Price or Contract Times, or both, to the extent that they are attributable to the existence or location of any Underground Facility that was not shown or indicated or not shown or indicated with reasonable accuracy in the Contract Documents and that Contractor did not know of and could not reasonably have been expected to be aware of or to have anticipated. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment in Contract Price or Contract Times, Owner or Contractor may make a Claim therefor as provided in Paragraph 10.05.

4.05 *Reference Points*

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

4.06 *Hazardous Environmental Condition at Site*

- A. *Reports and Drawings:* The Supplementary Conditions identify those reports and drawings known to Owner relating to Hazardous Environmental Conditions that have been identified at the Site.

- B. *Limited Reliance by Contractor on Technical Data Authorized:* Contractor may rely upon the accuracy of the “technical data” contained in such reports and drawings, but such reports and drawings are not Contract Documents. Such “technical data” is identified in the Supplementary Conditions. Except for such reliance on such “technical data,” Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors with respect to:
1. the completeness of such reports and drawings for Contractor’s purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences and procedures of construction to be employed by Contractor and safety precautions and programs incident thereto; or
  2. other data, interpretations, opinions and information contained in such reports or shown or indicated in such drawings; or
  3. any Contractor interpretation of or conclusion drawn from any “technical data” or any such other data, interpretations, opinions or information.
- C. Contractor shall not be responsible for any Hazardous Environmental Condition uncovered or revealed at the Site which was not shown or indicated in Drawings or Specifications or identified in the Contract Documents to be within the scope of the Work. Contractor shall be responsible for a Hazardous Environmental Condition created with any materials brought to the Site by Contractor, Subcontractors, Suppliers, or anyone else for whom Contractor is responsible.
- D. If Contractor encounters a Hazardous Environmental Condition or if Contractor or anyone for whom Contractor is responsible creates a Hazardous Environmental Condition, Contractor shall immediately: (i) secure or otherwise isolate such condition; (ii) stop all Work in connection with such condition and in any area affected thereby (except in an emergency as required by Paragraph 6.16.A); and (iii) notify Owner and Engineer (and promptly thereafter confirm such notice in writing). Owner shall ~~promptly~~ within seven (7) calendar days 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~~ After consulting with Engineer, Owner shall take such actions as are necessary to permit Owner to timely obtain required permits and provide Contractor the written notice required by Paragraph 4.06.E.
- E. Contractor shall not be required to resume Work in connection with such condition or in any affected area until after Owner has obtained any required permits related thereto and delivered written notice to Contractor: (i) specifying that such condition and any affected area is or has been rendered safe for the resumption of Work; or (ii) specifying any special conditions under which such Work may be resumed safely. If Owner and Contractor cannot agree as to entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times, or both, as a result of such Work stoppage or such special conditions under which Work is agreed to be resumed by Contractor, either party may make a Claim therefor as provided in Paragraph 10.05.
- F. If after receipt of such written notice Contractor does not agree to resume such Work based on a reasonable belief it is unsafe, or does not agree to resume such Work under such special

conditions, then Owner may order the portion of the Work that is in the area affected by such condition to be deleted from the Work. If Owner and Contractor cannot agree as to entitlement to or on the amount or extent, if any, of an adjustment in Contract Price or Contract Times as a result of deleting such portion of the Work, then either party may make a Claim therefor as provided in Paragraph 10.05. Owner may have such deleted portion of the Work performed by Owner's own forces or others in accordance with Article 7.

~~G. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition, provided that such Hazardous Environmental Condition: (i) was not shown or indicated in the Drawings or Specifications or identified in the Contract Documents to be included within the scope of the Work, and (ii) was not created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 4.06.G shall obligate Owner to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.~~

H. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 4.06.H shall obligate Contractor to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.

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

## ARTICLE 5 – BONDS AND INSURANCE

### 5.01 *Performance, Payment, and Other Bonds*

A. Contractor shall furnish performance and payment bonds, each in an amount at least equal to the Contract Price as security for the faithful performance and payment of all of Contractor's obligations under the Contract Documents. These bonds shall remain in effect until one year after the date when final payment becomes due or until completion of the correction period specified in Paragraph 13.07, whichever is later, except as provided otherwise by Laws or Regulations or by the Contract Documents. Contractor shall also furnish such other bonds as are required by the Contract Documents.

**The Contractor shall provide surety bonds wherein surety waives notice of any and all modifications, omissions, additions, changes and advance payments or deferred payments in or about the Contract, and agrees that the obligations undertaken by the bond shall not**

**be impaired in any manner by reason of such modifications, omissions, additions, changes, and advance payments or deferred payments. The surety bond must set forth no requirement that suit be initiated prior to the time stipulated in applicable North Carolina statutes of limitation.**

- B. All bonds shall be in the form prescribed by the Contract Documents except as provided otherwise by Laws or Regulations, and shall be executed by such sureties as are named in the list of “Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies” as published in Circular 570 (amended) by the Financial Management Service, Surety Bond Branch, U.S. Department of the Treasury. All bonds signed by an agent or attorney-in-fact must be accompanied by a certified copy of that individual’s authority to bind the surety. The evidence of authority shall show that it is effective on the date the agent or attorney-in-fact signed each bond.
- C. If the surety on any bond furnished by Contractor is declared bankrupt or becomes insolvent or its right to do business is terminated in any state where any part of the Project is located or it ceases to meet the requirements of Paragraph 5.01.B, Contractor shall promptly notify Owner and Engineer and shall, within 20 days after the event giving rise to such notification, provide another bond and surety, both of which shall comply with the requirements of Paragraphs 5.01.B and 5.02.

#### 5.02 *Licensed Sureties and Insurers*

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

#### 5.03 *Certificates of Insurance*

- A. Contractor shall deliver to Owner, with copies to each additional insured and loss payee identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance requested by Owner or any other additional insured) which Contractor is required to purchase and maintain.
- B. Owner shall deliver to Contractor, with copies to each additional insured and loss payee identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance requested by Contractor or any other additional insured) which Owner is required to purchase and maintain.
- C. Failure of Owner to demand such certificates or other evidence of Contractor's full compliance with these insurance requirements or failure of Owner to identify a deficiency in compliance from the evidence provided shall not be construed as a waiver of Contractor’s obligation to maintain such insurance.

- D. Owner does not represent that insurance coverage and limits established in this Contract necessarily will be adequate to protect Contractor.
- E. The insurance and insurance limits required herein shall not be deemed as a limitation on Contractor's liability under the indemnities granted to Owner in the Contract Documents.

5.04 *Contractor's Insurance*

- A. Contractor shall purchase and maintain such insurance as is appropriate for the Work being performed and as will provide protection from claims set forth below which may arise out of or result from Contractor's performance of the Work and Contractor's other obligations under the Contract Documents, whether it is to be performed by Contractor, any Subcontractor or Supplier, or by anyone directly or indirectly employed by any of them to perform any of the Work, or by anyone for whose acts any of them may be liable:
  - 1. claims under workers' compensation, disability benefits, and other similar employee benefit acts;
  - 2. claims for damages because of bodily injury, occupational sickness or disease, or death of Contractor's employees;
  - 3. claims for damages because of bodily injury, sickness or disease, or death of any person other than Contractor's employees;
  - 4. claims for damages insured by reasonably available personal injury liability coverage which are sustained:
    - a. by any person as a result of an offense directly or indirectly related to the employment of such person by Contractor, or
    - b. by any other person for any other reason;
  - 5. claims for damages, other than to the Work itself, because of injury to or destruction of tangible property wherever located, including loss of use resulting therefrom; and
  - 6. claims for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance or use of any motor vehicle.
- B. The policies of insurance required by this Paragraph 5.04 shall:
  - 1. with respect to insurance required by Paragraphs 5.04.A.3 through 5.04.A.6 inclusive, be written on an occurrence basis, include as additional insureds (subject to any customary exclusion regarding professional liability) Owner and Engineer, and any other individuals or entities identified in the Supplementary Conditions, all of whom shall be listed as additional insureds, and include coverage for the respective officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of all such additional insureds, and the insurance afforded to these additional insureds shall provide primary coverage for all claims covered thereby;



2. include at least the specific coverages and be written for not less than the limits of liability provided in ~~the Supplementary Conditions~~ Paragraph 5.04(C) or required by Laws or Regulations, whichever is greater;
3. include contractual liability insurance covering Contractor's indemnity obligations under Paragraphs 6.11 and 6.20;
4. contain a provision or endorsement that the coverage afforded will not be canceled, materially changed or renewal refused until at least 30 days prior written notice has been given to Owner and Contractor and to each other additional insured identified in the Supplementary Conditions to whom a certificate of insurance has been issued (and the certificates of insurance furnished by the Contractor pursuant to Paragraph 5.03 will so provide);
5. remain in effect at least until final payment and at all times thereafter when Contractor may be correcting, removing, or replacing defective Work in accordance with Paragraph 13.07; and
6. include completed operations coverage:
  - a. Such insurance shall remain in effect for two years after final payment.
  - b. Contractor shall furnish Owner and each other additional insured identified in the Supplementary Conditions, to whom a certificate of insurance has been issued, evidence satisfactory to Owner and any such additional insured of continuation of such insurance at final payment and one year thereafter.

**C. The Policies of insurance required by Paragraph 5.04 shall include the specific coverages and be written for not less than the limits of liability provided below or required by Laws or Regulations, whichever is greater.**

**Worker's Compensation and Employer's Liability Insurance. This insurance shall protect Contractor against all claims under applicable state workers' compensation laws, including coverage as necessary for the benefits provided under the United States Longshoremen's and Harbor Workers' Act and the Jones Act. Contractor shall also be protected against claims for injury, disease, or death of employees which, for any reason, may not fall within the provisions of a workers' compensation law. This policy shall include an "all states" or "other states" endorsement.**

**The liability limits shall be not less than:**

**Workers' compensation**

**Statutory**

**Employers' liability**

**\$1,000,000 each occurrence**

**Business Automobile Liability Insurance.** This insurance shall be occurrence type, written on Insurance Services Office (ISO) form CA 00 01, or a substitute form providing equivalent liability coverage, and shall protect Contractor, Owner, and Engineer as additional insureds, against all claims for injuries to members of the public and damage to property of others arising from the use of motor vehicles, either on or off the project site whether they are owned, nonowned, or hired.

**The liability limits shall be not less than:**

<b><u>Bodily injury and property damage</u></b>	<b><u>\$1,000,000 combined single limit for each occurrence</u></b>
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**Commercial General Liability Insurance.** This insurance shall be written on ISO "occurrence" form CG 00 01 or its equivalent, and shall protect Contractor, Owner, and Engineer as additional insureds, against claims arising from injuries, sickness, disease, or death of any person or damage to property arising out of performance of the Work. The Owner shall be included as an additional insured by ISO endorsements CG 20 10 or CG 20 33 and CG 20 37 or their equivalents; and the Engineer as additional insured by ISO endorsement CG 20 07 or CG 20 32 or its equivalent. The policy shall also include a per project aggregate limit endorsement, personal injury liability coverage, contractual liability coverage, completed operations and products liability coverage, and coverage for blasting, explosion, collapse of buildings, and damage to underground property.

**The liability limits shall be not less than:**

<b><u>Bodily injury and property damage</u></b>	<b><u>\$1,000,000 combined single limit for each occurrence</u></b>
	<b><u>\$1,000,000 general aggregate</u></b>

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**Umbrella Liability Insurance.** This insurance shall protect Contractor, Owner, and Engineer as additional insureds, against claims in excess of the limits provided under workers' compensation and employers' liability, business automobile liability, and commercial general liability policies. The umbrella policy shall follow the form of the primary insurance, including the application of the primary limits.

**The liability limits shall be not less than:**

**Bodily injury and property damage**

**\$4,000,000 combined single limit for each occurrence**

**\$4,000,000 general aggregate**

5.05 *Owner's Liability Insurance*

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

5.06 *Property Insurance*

- A. Unless otherwise provided in the Supplementary Conditions, ~~Owner~~ **Contractor** shall purchase and maintain property insurance upon the Work at the Site in the amount of the full replacement cost thereof (subject to such deductible amounts as may be provided in the Supplementary Conditions or required by Laws and Regulations). This insurance shall:

1. include the interests of Owner, Contractor, Subcontractors, and Engineer, and any other individuals or entities identified in the Supplementary Conditions, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, each of whom is deemed to have an insurable interest and shall be listed as a loss payee;
2. be written on a Builder's Risk "all-risk" policy form that shall at **a minimum cover the perils under the ISO special causes of loss policy form (CP 10 30) and least** include insurance for physical loss or damage to the Work, temporary buildings, falsework, and materials and equipment in transit, and shall insure against at least the following perils or causes of loss: fire, lightning, extended coverage, theft, vandalism and malicious mischief, earthquake, collapse, debris removal, demolition occasioned by enforcement of Laws and Regulations, water damage (other than that caused by flood), and such other perils or causes of loss as may be specifically required by the Supplementary Conditions.

**CONTRACTOR shall purchase and maintain boiler and machinery insurance required by the contract documents or by law, covering insured objects during installation and until final acceptance by Owner. In lieu of this separate policy, the contractor may have the boiler and machinery exclusion removed from the builder's risk policy.**

3. include expenses incurred in the repair or replacement of any insured property (including but not limited to fees and charges of engineers and architects);
4. cover materials and equipment stored at the Site or at another location that was agreed to in writing by Owner prior to being incorporated in the Work, provided that such materials and equipment have been included in an Application for Payment recommended by Engineer;

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

#### 5.07 *Waiver of Rights*

- A. Owner and Contractor intend that all policies purchased in accordance with Paragraph 5.06 will protect Owner, Contractor, Subcontractors, and Engineer, and all other individuals or entities identified in the Supplementary Conditions as loss payees (and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them) in such policies and will provide primary coverage for all losses and damages caused by the perils or causes of loss covered thereby. All such policies shall contain provisions to the effect that in the event of payment of any loss or damage the insurers will have no rights of recovery against any of the insureds or loss payees thereunder. Owner and Contractor waive all rights against each other and their respective officers, directors, members, partners, employees, agents, consultants and

subcontractors of each and any of them for all losses and damages caused by, arising out of or resulting from any of the perils or causes of loss covered by such policies and any other property insurance applicable to the Work; and, in addition, waive all such rights against Subcontractors and Engineer, and all other individuals or entities identified in the Supplementary Conditions as loss payees (and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them) under such policies for losses and damages so caused. None of the above waivers shall extend to the rights that any party making such waiver may have to the proceeds of insurance held by Owner as trustee or otherwise payable under any policy so issued.

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

#### 5.08 *Receipt and Application of Insurance Proceeds*

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

adjust and settle the loss with the insurers ~~and, if required in writing by any party in interest, Owner as fiduciary shall give bond for the proper performance of such duties.~~

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

- A. If either Owner or Contractor has any objection to the coverage afforded by or other provisions of the bonds or insurance required to be purchased and maintained by the other party in accordance with Article 5 on the basis of non-conformance with the Contract Documents, the objecting party shall so notify the other party in writing within 10 days after receipt of the certificates (or other evidence requested) required by Paragraph 2.01.B. Owner and Contractor shall each provide to the other such additional information in respect of insurance provided as the other may reasonably request. If either party does not purchase or maintain all of the bonds and insurance required of such party by the Contract Documents, such party shall notify the other party in writing of such failure to purchase prior to the start of the Work, or of such failure to maintain prior to any change in the required coverage. Without prejudice to any other right or remedy, the other party may elect to obtain equivalent bonds or insurance to protect such other party's interests at the expense of the party who was required to provide such coverage, and a Change Order shall be issued to adjust the Contract Price accordingly.

5.10 *Partial Utilization, Acknowledgment of Property Insurer*

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

## ARTICLE 6 – CONTRACTOR'S RESPONSIBILITIES

6.01 *Supervision and Superintendence*

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

## 6.02 *Labor; Working Hours*

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

## 6.03 *Services, Materials, and Equipment*

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

## 6.04 *Progress Schedule*

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

## 6.05 *Substitutes and "Or-Equals"*

- A. Whenever an item of material or equipment is specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular Supplier, the specification or

description is intended to establish the type, function, appearance, and quality required. Unless the specification or description contains or is followed by words reading that no like, equivalent, or “or-equal” item or no substitution is permitted, other items of material or equipment or material or equipment of other Suppliers may be submitted to Engineer for review under the circumstances described below.

1. *“Or-Equal” Items:* If in Engineer’s sole discretion an item of material or equipment proposed by Contractor is functionally equal to that named and sufficiently similar so that no change in related Work will be required, it may be considered by Engineer as an “or-equal” item, in which case review and approval of the proposed item may, in Engineer’s sole discretion, be accomplished without compliance with some or all of the requirements for approval of proposed substitute items. For the purposes of this Paragraph 6.05.A.1, a proposed item of material or equipment will be considered functionally equal to an item so named if:
  - a. in the exercise of reasonable judgment Engineer determines that:
    - 1) it is at least equal in materials of construction, quality, durability, appearance, strength, and design characteristics;
    - 2) it will reliably perform at least equally well the function and achieve the results imposed by the design concept of the completed Project as a functioning whole; and
    - 3) it has a proven record of performance and availability of responsive service.
  - b. Contractor certifies that, if approved and incorporated into the Work:
    - 1) there will be no increase in cost to the Owner or increase in Contract Times; and
    - 2) it will conform substantially to the detailed requirements of the item named in the Contract Documents.
2. *Substitute Items:*
  - a. If in Engineer’s sole discretion an item of material or equipment proposed by Contractor does not qualify as an “or-equal” item under Paragraph 6.05.A.1, it will be considered a proposed substitute item.
  - b. Contractor shall submit sufficient information as provided below to allow Engineer to determine if the item of material or equipment proposed is essentially equivalent to that named and an acceptable substitute therefor. Requests for review of proposed substitute items of material or equipment will not be accepted by Engineer from anyone other than Contractor.
  - c. The requirements for review by Engineer will be as set forth in Paragraph 6.05.A.2.d, as supplemented by the General Requirements, and as Engineer may decide is appropriate under the circumstances.



- d. Contractor shall make written application to Engineer for review of a proposed substitute item of material or equipment that Contractor seeks to furnish or use. The application:
- 1) shall certify that the proposed substitute item will:
    - a) perform adequately the functions and achieve the results called for by the general design,
    - b) be similar in substance to that specified, and
    - c) be suited to the same use as that specified;
  - 2) will state:
    - a) the extent, if any, to which the use of the proposed substitute item will **prejudice** **delay** Contractor's achievement of Substantial Completion on time,
    - b) whether use of the proposed substitute item in the Work will require a change in any of the Contract Documents (or in the provisions of any other direct contract with Owner for other work on the Project) to adapt the design to the proposed substitute item, and
    - c) whether incorporation or use of the proposed substitute item in connection with the Work is subject to payment of any license fee or royalty;
  - 3) will identify:
    - a) all variations of the proposed substitute item from that specified, and
    - b) available engineering, sales, maintenance, repair, and replacement services; and
  - 4) shall contain an itemized estimate of all costs or credits that will result directly or indirectly from use of such substitute item, including costs of redesign and claims of other contractors affected by any resulting change.

B. *Substitute Construction Methods or Procedures:* If a specific means, method, technique, sequence, or procedure of construction is expressly required by the Contract Documents, Contractor may furnish or utilize a substitute means, method, technique, sequence, or procedure of construction approved by Engineer. Contractor shall submit sufficient information to allow Engineer, in Engineer's sole discretion, to determine that the substitute proposed is equivalent to that expressly called for by the Contract Documents. The requirements for review by Engineer will be similar to those provided in Paragraph 6.05.A.2.

C. *Engineer's Evaluation:* Engineer will be allowed a reasonable time within which to evaluate each proposal or submittal made pursuant to Paragraphs 6.05.A and 6.05.B. Engineer may require Contractor to furnish additional data about the proposed substitute item. Engineer will be the sole judge of acceptability. No "or equal" or substitute will be ordered, installed or utilized until Engineer's review is complete, which will be evidenced by a Change Order in the case of a

substitute and an approved Shop Drawing for an “or equal.” Engineer will advise Contractor in writing of any negative determination.

- D. *Special Guarantee:* Owner may require Contractor to furnish at Contractor’s expense a special performance guarantee or other surety with respect to any substitute.
- E. *Engineer’s Cost Reimbursement:* Engineer will record Engineer’s costs in evaluating a substitute proposed or submitted by Contractor pursuant to Paragraphs 6.05.A.2 and 6.05.B. Whether or not Engineer approves a substitute so proposed or submitted by Contractor, Contractor shall reimburse Owner for the reasonable charges of Engineer for evaluating each such proposed substitute. Contractor shall also reimburse Owner for the reasonable charges of Engineer for making changes in the Contract Documents (or in the provisions of any other direct contract with Owner) resulting from the acceptance of each proposed substitute.
- F. *Contractor’s Expense:* Contractor shall provide all data in support of any proposed substitute or “or-equal” at Contractor’s expense.

#### 6.06 *Concerning Subcontractors, Suppliers, and Others*

- A. Contractor shall not employ any Subcontractor, Supplier, or other individual or entity (including those acceptable to Owner as indicated in Paragraph 6.06.B), whether initially or as a replacement, against whom Owner may have reasonable objection. Contractor shall not be required to employ any Subcontractor, Supplier, or other individual or entity to furnish or perform any of the Work against whom Contractor has reasonable objection.
- B. If the Supplementary Conditions require the identity of certain Subcontractors, Suppliers, or other individuals or entities to be submitted to Owner in advance for acceptance by Owner by a specified date prior to the Effective Date of the Agreement, and if Contractor has submitted a list thereof in accordance with the Supplementary Conditions, Owner’s acceptance (either in writing or by failing to make written objection thereto by the date indicated for acceptance or objection in the Bidding Documents or the Contract Documents) of any such Subcontractor, Supplier, or other individual or entity so identified may be revoked on the basis of reasonable objection after due investigation. Contractor shall submit an acceptable replacement for the rejected Subcontractor, Supplier, or other individual or entity, and the Contract Price will be adjusted by the difference in the cost occasioned by such replacement, and an appropriate Change Order will be issued. No acceptance by Owner of any such Subcontractor, Supplier, or other individual or entity, whether initially or as a replacement, shall constitute a waiver of any right of Owner or Engineer to reject defective Work.
- C. Contractor shall be fully responsible to Owner and Engineer for all acts and omissions of the Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work just as Contractor is responsible for Contractor’s own acts and omissions. Nothing in the Contract Documents:
  - 1. shall create for the benefit of any such Subcontractor, Supplier, or other individual or entity any contractual relationship between Owner or Engineer and any such Subcontractor, Supplier or other individual or entity; nor

2. shall create any obligation on the part of Owner or Engineer to pay or to see to the payment of any moneys due any such Subcontractor, Supplier, or other individual or entity except as may otherwise be required by Laws and Regulations.
- D. Contractor shall be solely responsible for scheduling and coordinating the Work of Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work under a direct or indirect contract with Contractor.
- E. Contractor shall require all Subcontractors, Suppliers, and such other individuals or entities performing or furnishing any of the Work to communicate with Engineer through Contractor.
- F. The divisions and sections of the Specifications and the identifications of any Drawings shall not control Contractor in dividing the Work among Subcontractors or Suppliers or delineating the Work to be performed by any specific trade.
- G. All Work performed for Contractor by a Subcontractor or Supplier will be pursuant to an appropriate agreement between Contractor and the Subcontractor or Supplier which specifically binds the Subcontractor or Supplier to the applicable terms and conditions of the Contract Documents for the benefit of Owner and Engineer. Whenever any such agreement is with a Subcontractor or Supplier who is listed as a loss payee on the property insurance provided in Paragraph 5.06, the agreement between the Contractor and the Subcontractor or Supplier will contain provisions whereby the Subcontractor or Supplier waives all rights against Owner, Contractor, Engineer, and all other individuals or entities identified in the Supplementary Conditions to be listed as insureds or loss payees (and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them) for all losses and damages caused by, arising out of, relating to, or resulting from any of the perils or causes of loss covered by such policies and any other property insurance applicable to the Work. If the insurers on any such policies require separate waiver forms to be signed by any Subcontractor or Supplier, Contractor will obtain the same.

#### 6.07 *Patent Fees and Royalties*

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

~~identified as being subject to payment of any license fee or royalty to others required by patent rights or copyrights.~~

- C. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device not specified in the Contract Documents.

#### 6.08 *Permits*

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

#### 6.09 *Laws and Regulations*

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

#### 6.10 *Taxes*

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

B. Pursuant to N.C.G.S. § 105-164.14, Owner is eligible for sales and use tax refunds on all materials which become a permanent part of the construction. Contractor agrees to provide Owner such documentation as may be necessary to meet the requirements of the North Carolina Department of Revenue regarding requests for refund of sales and use taxes. Such requirements include those described in the North Carolina Department of Revenue Sales and Use Tax Technical Bulletins § 18-2(F), outlined below:

1. To substantiate a refund claim for sales or use taxes paid on purchases of building materials, supplies, fixtures, and equipment by a contractor, Owner must secure from a contractor certified statements setting forth the specific required information. A “certified statement” is a statement signed by a contractor’s owner, a corporate officer of a contractor, or an employee of a contractor who is authorized to provide information set forth in the statement. The certified statement must include all of the following information:
  - a. The date the property was purchased;
  - b. The type of property purchased;
  - c. The cost of property purchased and the amount of sales and use taxed paid thereon;
  - d. The vendor from whom the property was purchased;
  - e. The project for which the property was purchased;
  - f. If the property was purchased in the State of North Carolina, the county to which it was delivered, or, if the property was not purchased in the State of North Carolina, the county in which the property was used; and
  - g. The invoice number of the purchase.
2. In the event Contractor makes several purchases from the same vendor, such certified statement must indicate the invoice numbers, the inclusive dates of the invoices, the total amount of the invoices, and the State and local sales and use taxes paid thereon. Such statement must also include the cost of any tangible personal property withdrawn from Contractor’s warehouse stock and the amount of State and local sales or use tax paid thereon by Contractor. Any local sales or use taxes included in Contractor’s statements must be shown separately from the State sales or use taxes. Contractor’s statements must not contain sales or use taxes paid on purchases of tangible personal property purchased by Contractor for use in performing the Contract which does not annex to, affix to or in some manner become a part of the building or structure that is owned or leased by a governmental agency and is being erected, altered or repaired for use by a governmental entity as defined by N.C.G.S. § 105-164.14(c). Examples of property on which sales or use tax has been paid by Contractor and which shall not be included in Contractor’s certified statement are scaffolding, forms for concrete, fuel for the operation of machinery and equipment, tools, equipment, equipment repair parts and equipment rentals. Similar certified statements by Subcontractors must be obtained by Contractor and furnished to Owner.

3. **Contractor shall submit notarized sales tax certificates which meet the requirements detailed above with each Application for Payment. Payment will not be made until the sales tax certificate(s) have been submitted to Owner. Owner is the recipient of sales tax refunds and no such funds shall be provided to Contractor, or claim made by Contractor therefor.**

6.11 *Use of Site and Other Areas*

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

1. Contractor shall confine construction equipment, the storage of materials and equipment, and the operations of workers to the Site and other areas permitted by Laws and Regulations, and shall not unreasonably encumber the Site and other areas with construction equipment or other materials or equipment. Contractor shall assume full responsibility for any damage to any such land or area, or to the owner or occupant thereof, or of any adjacent land or areas resulting from the performance of the Work.
2. Should any claim be made by any such owner or occupant because of the performance of the Work, Contractor shall promptly settle with such other party by negotiation or otherwise resolve the claim by ~~arbitration or other~~ dispute resolution proceeding or at law.
3. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any claim or action, legal or equitable, brought by any such owner or occupant against Owner, Engineer, or any other party indemnified hereunder to the extent caused by or based upon Contractor's performance of the Work.

B. *Removal of Debris During Performance of the Work:* During the progress of the Work Contractor shall keep the Site and other areas free from accumulations of waste materials, rubbish, and other debris. Removal and disposal of such waste materials, rubbish, and other debris shall conform to applicable Laws and Regulations.

C. *Cleaning:* Prior to Substantial Completion of the Work Contractor shall clean the Site and the Work and make it ready for utilization by Owner. At the completion of the Work Contractor shall remove from the Site all tools, appliances, construction equipment and machinery, and surplus materials and shall restore to original condition all property not designated for alteration by the Contract Documents.

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

## 6.12 *Record Documents*

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

## 6.13 *Safety and Protection*

- A. Contractor shall be solely responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the Work. Such responsibility does not relieve Subcontractors of their responsibility for the safety of persons or property in the performance of their work, nor for compliance with applicable safety Laws and Regulations. Contractor shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury or loss to:
  - 1. all persons on the Site or who may be affected by the Work;
  - 2. all the Work and materials and equipment to be incorporated therein, whether in storage on or off the Site; and
  - 3. other property at the Site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, utilities, and Underground Facilities not designated for removal, relocation, or replacement in the course of construction.
- B. Contractor shall comply with all applicable Laws and Regulations relating to the safety of persons or property, or to the protection of persons or property from damage, injury, or loss; and shall erect and maintain all necessary safeguards for such safety and protection. Contractor shall notify owners of adjacent property and of Underground Facilities and other utility owners when prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation, and replacement of their property.
- C. Contractor shall comply with the applicable requirements of Owner's safety programs, if any. The Supplementary Conditions identify any Owner's safety programs that are applicable to the Work.
- D. Contractor shall inform Owner and Engineer of the specific requirements of Contractor's safety program with which Owner's and Engineer's employees and representatives must comply while at the Site.
- E. All damage, injury, or loss to any property referred to in Paragraph 6.13.A.2 or 6.13.A.3 caused, directly or indirectly, in whole or in part, by Contractor, any Subcontractor, Supplier, or any other individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, shall be remedied by Contractor ~~(except damage or loss attributable to the fault of Drawings or Specifications or to the acts or~~

~~omissions of Owner or Engineer or anyone employed by any of them, or anyone for whose acts any of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of Contractor or any Subcontractor, Supplier, or other individual or entity directly or indirectly employed by any of them).~~

- F. Contractor's duties and responsibilities for safety and for protection of the Work shall continue until such time as all the Work is completed and Engineer has issued a notice to Owner and Contractor in accordance with Paragraph 14.07.B that the Work is acceptable (except as otherwise expressly provided in connection with Substantial Completion).

#### 6.14 *Safety Representative*

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

#### 6.15 *Hazard Communication Programs*

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

#### 6.16 *Emergencies*

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

#### 6.17 *Shop Drawings and Samples*

- A. Contractor shall submit Shop Drawings and Samples to Engineer for review and approval in accordance with the accepted Schedule of Submittals (as required by Paragraph 2.07). Each submittal will be identified as Engineer may require.

##### 1. *Shop Drawings:*

- a. Submit number of copies specified in the General Requirements.
- b. Data shown on the Shop Drawings will be complete with respect to quantities, dimensions, specified performance and design criteria, materials, and similar data to show Engineer the services, materials, and equipment Contractor proposes to provide and to enable Engineer to review the information for the limited purposes required by Paragraph 6.17.D.



2. *Samples:*

- a. Submit number of Samples specified in the Specifications.
  - b. Clearly identify each Sample as to material, Supplier, pertinent data such as catalog numbers, the use for which intended and other data as Engineer may require to enable Engineer to review the submittal for the limited purposes required by Paragraph 6.17.D.
- B. Where a Shop Drawing or Sample is required by the Contract Documents or the Schedule of Submittals, any related Work performed prior to Engineer's review and approval of the pertinent submittal will be at the sole expense and responsibility of Contractor.

C. *Submittal Procedures:*

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

D. *Engineer's Review:*

1. Engineer will provide timely review of Shop Drawings and Samples in accordance with the Schedule of Submittals acceptable to Engineer. Engineer's review and approval will be only to determine if the items covered by the submittals will, after installation or incorporation in the Work, conform to the information given in the Contract Documents and be compatible

with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents.

2. Engineer's review and approval will not extend to means, methods, techniques, sequences, or procedures of construction (except where a particular means, method, technique, sequence, or procedure of construction is specifically and expressly called for by the Contract Documents) or to safety precautions or programs incident thereto. The review and approval of a separate item as such will not indicate approval of the assembly in which the item functions.
3. Engineer's review and approval shall not relieve Contractor from responsibility for any variation from the requirements of the Contract Documents unless Contractor has complied with the requirements of Paragraph 6.17.C.3 and Engineer has given written approval of each such variation by specific written notation thereof incorporated in or accompanying the Shop Drawing or Sample. Engineer's review and approval shall not relieve Contractor from responsibility for complying with the requirements of Paragraph 6.17.C.1.

E. *Resubmittal Procedures:*

1. Contractor shall make corrections required by Engineer and shall return the required number of corrected copies of Shop Drawings and ~~submit~~, **resubmit**, 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. **All resubmittals by Contractor to Engineer shall be within fourteen (14) calendar days after receipt by Contractor unless additional time is approved in writing by Engineer.**

F. **Contractor shall furnish required submittals with sufficient information and accuracy in order to obtain required approval of an item with no more than three (3) submittals. Engineer will record Engineer's time for reviewing submittals subsequent to the third submittal and Contractor shall reimburse Owner for Engineer's charges for such time.**

G. **In the event Contractor requests a substitution for a previously approved item, Contractor shall reimburse Owner for Engineer's charges for such time.**

6.18 *Continuing the Work*

- A. Contractor shall carry on the Work and adhere to the Progress Schedule during all disputes or disagreements with Owner. No Work shall be delayed or postponed pending resolution of any disputes or disagreements, except as permitted by Paragraph 15.04 or as Owner and Contractor may otherwise agree in writing.

6.19 *Contractor's General Warranty and Guarantee*

- A. Contractor warrants and guarantees to Owner that all Work will be in accordance with the Contract Documents and will not be defective. Engineer and its officers, directors, members, partners, employees, agents, consultants, and subcontractors shall be entitled to rely on representation of Contractor's warranty and guarantee.
- B. Contractor's warranty and guarantee hereunder excludes defects or damage caused by:

1. abuse, modification, or improper maintenance or operation by persons other than Contractor, Subcontractors, Suppliers, or any other individual or entity for whom Contractor is responsible; or
  2. normal wear and tear under normal usage.
- C. Contractor's obligation to perform and complete the Work in accordance with the Contract Documents shall be absolute. None of the following will constitute an acceptance of Work that is not in accordance with the Contract Documents or a release of Contractor's obligation to perform the Work in accordance with the Contract Documents:
1. observations by Engineer;
  2. recommendation by Engineer or payment by Owner of any progress or final payment;
  3. the issuance of a certificate of Substantial Completion by Engineer or any payment related thereto by Owner;
  4. use or occupancy of the Work or any part thereof by Owner;
  5. any review and approval of a Shop Drawing or Sample submittal or the issuance of a notice of acceptability by Engineer;
  6. any inspection, test, or approval by others; or
  7. any correction of defective Work by Owner.

#### 6.20 *Indemnification*

- A. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to the performance of the Work, provided that any such claim, cost, loss, or damage is attributable to bodily injury, sickness, disease, or death, or to injury to or destruction of tangible property (other than the Work itself), including the loss of use resulting therefrom but only to the extent caused by any negligent act or omission of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work or anyone for whose acts any of them may be liable .
- B. In any and all claims against Owner or Engineer or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors by any employee (or the survivor or personal representative of such employee) of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, the indemnification obligation under Paragraph 6.20.A shall not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for Contractor or any such Subcontractor, Supplier, or

other individual or entity under workers' compensation acts, disability benefit acts, or other employee benefit acts.

- C. The indemnification obligations of Contractor under Paragraph 6.20.A shall not extend to the liability of Engineer and Engineer's officers, directors, members, partners, employees, agents, consultants and subcontractors arising out of:
1. the preparation or approval of, or the failure to prepare or approve maps, Drawings, opinions, reports, surveys, Change Orders, designs, or Specifications; or
  2. giving directions or instructions, or failing to give them, if that is the primary cause of the injury or damage.

#### 6.21 *Delegation of Professional Design Services*

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

## ARTICLE 7 – OTHER WORK AT THE SITE

### 7.01 *Related Work at Site*

- A. Owner may perform other work related to the Project at the Site with Owner's employees, or through other direct contracts therefor, or have other work performed by utility owners. If such other work is not noted in the Contract Documents, then:
- ~~1. written notice thereof will be given to Contractor prior to starting any such other work; and~~
  - ~~2. if Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times that should be allowed as a result of such other work, a Claim may be made therefor as provided in Paragraph 10.05.~~
- B. Contractor shall afford each other contractor who is a party to such a direct contract, each utility owner, and Owner, if Owner is performing other work with Owner's employees, proper and safe access to the Site, provide a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such other work, and properly coordinate the Work **with theirs. in accordance with Section 7.02.** Contractor shall do all cutting, fitting, and patching of the Work that may be required to properly connect or otherwise make its several parts come together and properly integrate with such other work. Contractor shall not endanger any work of others by cutting, excavating, or otherwise altering such work; provided, however, that Contractor may cut or alter others' work with the written consent of Engineer and the others whose work will be affected. The duties and responsibilities of Contractor under this Paragraph are for the benefit of such utility owners and other contractors to the extent that there are comparable provisions for the benefit of Contractor in said direct contracts between Owner and such utility owners and other contractors.
- C. If the proper execution or results of any part of Contractor's Work depends upon work performed by others under this Article 7, Contractor shall inspect such other work and promptly report to Engineer in writing any delays, defects, or deficiencies in such other work that render it unavailable or unsuitable for the proper execution and results of Contractor's Work. Contractor's failure to so report will constitute an acceptance of such other work as fit and proper for integration with Contractor's Work except for latent defects and deficiencies in such other work.

### 7.02 *Coordination*

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

- B. Unless otherwise provided in the Supplementary Conditions, Owner shall have sole authority and responsibility for such coordination.

7.03 *Legal Relationships*

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

7.04 *Damage to Work of Another Contractor*

- A. *Should Contractor cause damage to the work or property of any other contractor at the Site, or should any claim arising out of Contractor's performance of the Work at the Site be made by any other contractor against Owner or Engineer, Contractor shall promptly attempt to settle with such contractor by agreement, or otherwise resolve the dispute by mediation or at law.*

**ARTICLE 8 – OWNER'S RESPONSIBILITIES**

8.01 *Communications to Contractor*

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

8.02 *Replacement of Engineer*

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

~~8.03 *Furnish Data*~~

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

~~8.04 *Pay When Due*~~

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

~~8.05 *Lands and Easements; Reports and Tests*~~

- ~~A. Owner's duties with respect to providing lands and easements and providing engineering surveys to establish reference points are set forth in Paragraphs 4.01 and 4.05. Paragraph 4.02 refers to Owner's identifying and making available to Contractor copies of reports of~~

~~explorations and tests of subsurface conditions and drawings of physical conditions relating to existing surface or subsurface structures at the Site.~~

~~8.06—Insurance~~

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

~~8.07—Change Orders~~

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

~~8.08—Inspections, Tests, and Approvals~~

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

8.03 *Limitations on Owner's Responsibilities*

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

~~8.04—Undisclosed Hazardous Environmental Condition~~

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

8.04 *Evidence of Financial Arrangements*

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

8.05 *Compliance with Safety Program*

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

## ARTICLE 9 – ENGINEER'S STATUS DURING CONSTRUCTION

9.01 *Owner's Representative*

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

## 9.02 *Visits to Site*

- A. Engineer will make visits to the Site at intervals appropriate to the various stages of construction as Engineer deems necessary in order to observe as an experienced and qualified design professional the progress that has been made and the quality of the various aspects of Contractor's executed Work. Based on information obtained during such visits and observations, Engineer, for the benefit of Owner, will determine, in general, if the Work is proceeding in accordance with the Contract Documents. Engineer will not be required to make exhaustive or continuous inspections on the Site to check the quality or quantity of the Work. Engineer's efforts will be directed toward providing for Owner a greater degree of confidence that the completed Work will conform generally to the Contract Documents. On the basis of such visits and observations, Engineer will keep Owner informed of the progress of the Work and will endeavor to guard Owner against defective Work.
- B. Engineer's visits and observations are subject to all the limitations on Engineer's authority and responsibility set forth in Paragraph 9.09. Particularly, but without limitation, during or as a result of Engineer's visits or observations of Contractor's Work, Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work.

## 9.03 *Project Representative*

- A. If Owner and Engineer agree, Engineer will furnish a Resident Project Representative to assist Engineer in providing more extensive observation of the Work. The authority and responsibilities of any such Resident Project Representative and assistants will be as provided in the Supplementary Conditions, and limitations on the responsibilities thereof will be as provided in Paragraph ~~9.09~~, 9.08. If Owner designates another representative or agent to represent Owner at the Site who is not Engineer's consultant, agent or employee, the responsibilities and authority and limitations thereon of such other individual or entity will be as provided in the Supplementary Conditions.

## 9.04 *Authorized Variations in Work*

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



9.05 *Rejecting Defective Work*

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

~~9.06 *Shop Drawings, Change Orders and Payments*~~

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

9.06 *Determinations for Unit Price Work*

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

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

- A. Engineer will be the initial interpreter of the requirements of the Contract Documents and judge of the acceptability of the Work thereunder. All matters in question and other matters between Owner and Contractor arising prior to the date final payment is due relating to the acceptability of the Work, and the interpretation of the requirements of the Contract Documents pertaining to the performance of the Work, will be referred initially to Engineer in writing within **30 seven (7) calendar** days of the event giving rise to the question.
- B. Engineer will, ~~with reasonable promptness,~~ **within seven (7) days,** render a written decision on the issue referred. If Owner or Contractor believes that any such decision entitles them to an adjustment in the Contract Price or Contract Times or both, a Claim may be made under Paragraph 10.05. The date of Engineer's decision shall be the date of the event giving rise to the issues referenced for the purposes of Paragraph 10.05.B.
- C. Engineer's written decision on the issue referred will be final and binding on Owner and Contractor, subject to the provisions of Paragraph 10.05.

- D. When functioning as interpreter and judge under this Paragraph 9.08, Engineer will not show partiality to Owner or Contractor and will not be liable in connection with any interpretation or decision rendered in good faith in such capacity.

9.08 *Limitations on Engineer's Authority and Responsibilities*

- A. Neither Engineer's authority or responsibility under this Article 9 or under any other provision of the Contract Documents nor any decision made by Engineer in good faith either to exercise or not exercise such authority or responsibility or the undertaking, exercise, or performance of any authority or responsibility by Engineer shall create, impose, or give rise to any duty in contract, tort, or otherwise owed by Engineer to Contractor, any Subcontractor, any Supplier, any other individual or entity, or to any surety for or employee or agent of any of them.
- B. Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Engineer will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.
- C. Engineer will not be responsible for the acts or omissions of Contractor or of any Subcontractor, any Supplier, or of any other individual or entity performing any of the Work.
- D. Engineer's review of the final Application for Payment and accompanying documentation and all maintenance and operating instructions, schedules, guarantees, bonds, certificates of inspection, tests and approvals, and other documentation required to be delivered by Paragraph 14.07.A will only be to determine generally that their content complies with the requirements of, and in the case of certificates of inspections, tests, and approvals that the results certified indicate compliance with, the Contract Documents.
- E. The limitations upon authority and responsibility set forth in this Paragraph 9.09 shall also apply to the Resident Project Representative, if any, and assistants, if any.

9.09 *Compliance with Safety Program*

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

**ARTICLE 10 – CHANGES IN THE WORK; CLAIMS**

10.01 *Authorized Changes in the Work*

- A. Without invalidating the Contract and without notice to any surety, Owner may, at any time or from time to time, **unilaterally** order additions, deletions, or revisions in the Work by a Change Order, or a Work Change Directive, **including, but not limited to, variations in quantities between estimated and actual quantities**. Upon receipt of any such document, Contractor shall promptly proceed with the Work involved which will be performed under the applicable conditions of the Contract Documents (except as otherwise specifically provided).

- B. If Owner and Contractor are unable to agree on entitlement to, or on the amount or extent, if any, of an adjustment in the Contract Price or Contract Times, or both, that should be allowed as a result of a Work Change Directive, a Claim may be made therefor as provided in Paragraph 10.05.

10.02 *Unauthorized Changes in the Work*

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

10.03 *Execution of Change Orders*

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

10.04 *Notification to Surety*

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

10.05 *Claims*

- A. *Engineer's Decision Required:* All Claims, except those waived pursuant to Paragraph 14.09, shall be referred to the Engineer for decision. A decision by Engineer shall be required as a condition precedent to any exercise by Owner or Contractor of any rights or remedies either may otherwise have under the Contract Documents or by Laws and Regulations in respect of such Claims.

- B. *Notice:* Written notice stating the general nature of each Claim shall be delivered by the claimant to Engineer and the other party to the Contract ~~promptly (but in no event later than 30 days)~~ **within seven (7) calendar days** after the start of the event giving rise thereto. The responsibility to substantiate a Claim shall rest with the party making the Claim. Notice of the amount or extent of the Claim, with supporting data shall be delivered to the Engineer and the other party to the Contract within ~~60~~ **thirty (30)** days after the start of such event (unless Engineer allows additional time for claimant to submit additional or more accurate data in support of such Claim). A Claim for an adjustment in Contract Price shall be prepared in accordance with the provisions of Paragraph 12.01.B. A Claim for an adjustment in Contract Times shall be prepared in accordance with the provisions of Paragraph 12.02.B. Each Claim shall be accompanied by claimant's written **statement certification** that the adjustment claimed is the entire adjustment to which the claimant believes it is entitled as a result of said event. The opposing party shall submit any response to Engineer and the claimant within ~~30~~ **twenty (20)** days after receipt of the claimant's last submittal (unless Engineer allows additional time).
- C. *Engineer's Action:* Engineer will review each Claim and, within 30 days after receipt of the last submittal of the claimant or the last submittal of the opposing party, if any, take one of the following actions in writing:
1. deny the Claim in whole or in part;
  2. approve the Claim; or
  3. notify the parties that the Engineer is unable to resolve the Claim if, in the Engineer's sole discretion, it would be inappropriate for the Engineer to do so. For purposes of further resolution of the Claim, such notice shall be deemed a denial.
- D. In the event that Engineer does not take action on a Claim within said 30 days, the Claim shall be deemed denied.
- E. Engineer's written action under Paragraph 10.05.C or denial pursuant to Paragraphs 10.05.C.3 or 10.05.D will be final and binding upon Owner and Contractor, unless Owner or Contractor invoke the dispute resolution procedure set forth in Article 16 within 30 days of such action or denial.
- F. No Claim for an adjustment in Contract Price or Contract Times will be valid if not submitted in **strict** accordance with this Paragraph 10.05 **and failure to submit such Claim in strict accordance with this Paragraph 10.05 shall be deemed a WAIVER of such Claim.**

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

### *11.01 Cost of the Work*

- A. *Costs Included:* The term Cost of the Work means the sum of all costs, except those excluded in Paragraph 11.01.B, necessarily incurred and paid by Contractor in the proper performance of the Work. When the value of any Work covered by a Change Order or when a Claim for an adjustment in Contract Price is determined on the basis of Cost of the Work, the costs to be reimbursed to Contractor will be only those additional or incremental costs required because of

the change in the Work or because of the event giving rise to the Claim. Except as otherwise may be agreed to in writing by Owner, such costs shall be in amounts no higher than those prevailing in the locality of the Project, shall not include any of the costs itemized in Paragraph 11.01.B, and shall include only the following items:

1. Payroll costs for employees in the direct employ of Contractor in the performance of the Work under schedules of job classifications agreed upon by Owner and Contractor. Such employees shall include, without limitation, superintendents, foremen, and other personnel employed full time on the Work. Payroll costs for employees not employed full time on the Work shall be apportioned on the basis of their time spent on the Work. Payroll costs shall include, but not be limited to, salaries and wages plus the cost of fringe benefits, which shall include social security contributions, unemployment, excise, and payroll taxes, workers' compensation, health and retirement benefits, ~~bonuses~~, sick leave, vacation and holiday pay applicable thereto. The expenses of performing Work outside of regular working hours, on Saturday, Sunday, or legal holidays, shall be included in the above to the extent authorized by Owner.
2. Cost of all materials and equipment furnished and incorporated in the Work, including costs of transportation and storage thereof, and Suppliers' field services required in connection therewith. All cash discounts shall accrue to Contractor unless Owner deposits funds with Contractor with which to make payments, in which case the cash discounts shall accrue to Owner. All trade discounts, rebates and refunds and returns from sale of surplus materials and equipment shall accrue to Owner, and Contractor shall make provisions so that they may be obtained.
3. Payments made by Contractor to Subcontractors for Work performed by Subcontractors. If required by Owner, Contractor shall obtain competitive bids from subcontractors acceptable to Owner and Contractor and shall deliver such bids to Owner, who will then determine, with the advice of Engineer, which bids, if any, will be acceptable. If any subcontract provides that the Subcontractor is to be paid on the basis of Cost of the Work plus a fee, the Subcontractor's Cost of the Work and fee shall be determined in the same manner as Contractor's Cost of the Work and fee as provided in this Paragraph 11.01.
4. **If prior written approval by Owner is obtained, costs** ~~Costs~~ of special consultants (including but not limited to engineers, architects, testing laboratories, surveyors, attorneys, and accountants) employed for services specifically related to the Work.
5. Supplemental costs including the following:
  - a. **If prior written approval by Owner is obtained, the** ~~The~~ proportion of necessary transportation, travel, and subsistence expenses of Contractor's employees incurred in discharge of duties connected with the Work.
  - b. Cost, including transportation and maintenance, of all materials, supplies, equipment, machinery, appliances, office, and temporary facilities at the Site, and hand tools not owned by the workers, which are consumed in the performance of the Work, and cost,

less market value, of such items used but not consumed which remain the property of Contractor.

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

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

1. Payroll costs and other compensation of Contractor's officers, executives, principals (of partnerships and sole proprietorships), general managers, safety managers, engineers, architects, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expeditors, timekeepers, clerks, and other personnel employed by Contractor, whether at the Site or in Contractor's principal or branch office for general administration of the Work and not specifically included in the agreed upon schedule of job classifications referred to in Paragraph 11.01.A.1 or specifically covered by Paragraph 11.01.A.4, all of which are to be considered administrative costs covered by the Contractor's fee.

2. Expenses of Contractor's principal and branch offices other than Contractor's office at the Site.
  3. Any part of Contractor's capital expenses, including interest on Contractor's capital employed for the Work and charges against Contractor for delinquent payments.
  4. Costs due to the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not limited to, the correction of defective Work, disposal of materials or equipment wrongly supplied, and making good any damage to property.
  5. Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in Paragraphs 11.01.A.
- C. *Contractor's Fee:* When all the Work is performed on the basis of cost-plus, Contractor's fee shall be determined as set forth in the Agreement. When the value of any Work covered by a Change Order or when a Claim for an adjustment in Contract Price is determined on the basis of Cost of the Work, Contractor's fee shall be determined as set forth in Paragraph 12.01.C.
- D. *Documentation:* Whenever the Cost of the Work for any purpose is to be determined pursuant to Paragraphs 11.01.A and 11.01.B, Contractor will establish and maintain records thereof in accordance with generally accepted accounting practices and submit in a form acceptable to Engineer an itemized cost breakdown together with supporting data.

## 11.02 Allowances

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

- D. Prior to final payment, an appropriate Change Order will be issued as recommended by Engineer to reflect actual amounts due Contractor on account of Work covered by allowances, and the Contract Price shall be correspondingly adjusted.

#### 11.03 *Unit Price Work*

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

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

#### 12.01 *Change of Contract Price*

- A. The Contract Price may only be changed by a Change Order. Any Claim for an adjustment in the Contract Price shall be based on written notice submitted by the party making the Claim to the Engineer and the other party to the Contract in accordance with the provisions of Paragraph 10.05. **No change in the Contract Price will be approved for defective pricing upon Bid submission and award, or errors in bidding.**
- B. The value of any Work covered by a Change Order or of any Claim for an adjustment in the Contract Price will be determined as follows:
  - 1. where the Work involved is covered by unit prices contained in the Contract Documents, by application of such unit prices to the quantities of the items involved (subject to the provisions of Paragraph 11.03); or



2. where the Work involved is not covered by unit prices contained in the Contract Documents, by a mutually agreed lump sum (which may include an allowance for overhead and profit not necessarily in accordance with Paragraph 12.01.C.2); or
  3. where the Work involved is not covered by unit prices contained in the Contract Documents and agreement to a lump sum is not reached under Paragraph 12.01.B.2, on the basis of the Cost of the Work (determined as provided in Paragraph 11.01) plus a Contractor's fee for overhead and profit (determined as provided in Paragraph 12.01.C).
- C. *Contractor's Fee:* The Contractor's fee for overhead and profit shall be determined as follows:
1. a mutually acceptable fixed fee; or
  2. if a fixed fee is not agreed upon, then a fee based on the following percentages of the various portions of the Cost of the Work:
    - a. for costs incurred under Paragraphs 11.01.A.1 and 11.01.A.2, the Contractor's fee shall be 15 percent;
    - b. for costs incurred under Paragraph 11.01.A.3, the Contractor's fee shall be five percent;
    - c. where one or more tiers of subcontracts are on the basis of Cost of the Work plus a fee and no fixed fee is agreed upon, the intent of Paragraphs 12.01.C.2.a and 12.01.C.2.b is that the Subcontractor who actually performs the Work, at whatever tier, will be paid a fee of 15 percent of the costs incurred by such Subcontractor under Paragraphs 11.01.A.1 and 11.01.A.2 and that any higher tier Subcontractor and Contractor will each be paid a fee of five percent of the amount paid to the next lower tier Subcontractor;
    - d. no fee shall be payable on the basis of costs itemized under Paragraphs 11.01.A.4, 11.01.A.5, and 11.01.B;
    - e. the amount of credit to be allowed by Contractor to Owner for any change which results in a net decrease in cost will be the amount of the actual net decrease in cost plus a deduction in Contractor's fee by an amount equal to five percent of such net decrease; and
    - f. when both additions and credits are involved in any one change, the adjustment in Contractor's fee shall be computed on the basis of the net change in accordance with Paragraphs 12.01.C.2.a through 12.01.C.2.e, inclusive.

## 12.02 *Change of Contract Times*

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

- B. Any adjustment of the Contract Times covered by a Change Order or any Claim for an adjustment in the Contract Times will be determined in accordance with the provisions of this Article 12.

### 12.03 *Delays*

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

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

### 13.01 *Notice of Defects*

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

### 13.02 *Access to Work*

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

### 13.03 *Tests and Inspections*

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

#### 13.04 *Uncovering Work*

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

#### 13.05 *Owner May Stop the Work*

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

#### 13.06 *Correction or Removal of Defective Work*

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

### 13.07 *Correction Period*

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

### 13.08 *Acceptance of Defective Work*

- A. If, instead of requiring correction or removal and replacement of defective Work, Owner (and, prior to Engineer's recommendation of final payment, Engineer) prefers to accept it, Owner may do so. Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or

arbitration or other dispute resolution costs) attributable to Owner's evaluation of and determination to accept such defective Work (such costs to be approved by Engineer as to reasonableness) and for the diminished value of the Work to the extent not otherwise paid by Contractor pursuant to this sentence. If any such acceptance occurs prior to Engineer's recommendation of final payment, a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work, and Owner shall be entitled to an appropriate decrease in the Contract Price, reflecting the diminished value of Work so accepted. If the parties are unable to agree as to the amount thereof, Owner may make a Claim therefor as provided in Paragraph 10.05. If the acceptance occurs after such recommendation, an appropriate amount will be paid by Contractor to Owner.

### 13.09 *Owner May Correct Defective Work*

- A. If Contractor fails within ~~a reasonable time~~ **fourteen (14) calendar days** after written notice from Engineer to correct defective Work, or to remove and replace rejected Work as required by Engineer in accordance with Paragraph 13.06.A, or if Contractor fails to perform the Work in accordance with the Contract Documents, or if Contractor fails to comply with any other provision of the Contract Documents, Owner may, after ~~seven~~ **fourteen (14) calendar** days written notice to Contractor, correct, or remedy any such deficiency. **If additional time is required due to unforeseen circumstances, a written notice is required detailing the circumstances and delay within seven (7) days of written notice from Engineer.**
- B. In exercising the rights and remedies under this Paragraph 13.09, Owner shall proceed expeditiously. In connection with such corrective or remedial action, Owner may exclude Contractor from all or part of the Site, take possession of all or part of the Work and suspend Contractor's services related thereto, take possession of Contractor's tools, appliances, construction equipment and machinery at the Site, and incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere. Contractor shall allow Owner, Owner's representatives, agents and employees, Owner's other contractors, and Engineer and Engineer's consultants access to the Site to enable Owner to exercise the rights and remedies under this Paragraph.
- C. All claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) incurred or sustained by Owner in exercising the rights and remedies under this Paragraph 13.09 will be charged against Contractor, and a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work; and Owner shall be entitled to an appropriate decrease in the Contract Price. If the parties are unable to agree as to the amount of the adjustment, Owner may make a Claim therefor as provided in Paragraph 10.05. Such claims, costs, losses and damages will include but not be limited to all costs of repair, or replacement of work of others destroyed or damaged by correction, removal, or replacement of Contractor's defective Work.
- D. Contractor shall not be allowed an extension of the Contract Times because of any delay in the performance of the Work attributable to the exercise by Owner of Owner's rights and remedies under this Paragraph 13.09.

## ARTICLE 14 – PAYMENTS TO CONTRACTOR AND COMPLETION

### 14.01 *Schedule of Values*

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

### 14.02 *Progress Payments*

#### A. *Applications for Payments:*

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

#### B. *Review of Applications:*

1. Engineer will, within ~~10~~ **fourteen (14) calendar** days after receipt of each Application for Payment, either indicate in writing a recommendation of payment and present the Application to Owner or return the Application to Contractor indicating in writing Engineer's reasons for refusing to recommend payment. In the latter case, Contractor may make the necessary corrections and resubmit the Application.
2. Engineer's recommendation of any payment requested in an Application for Payment will constitute a representation by Engineer to Owner, based on Engineer's observations of the executed Work as an experienced and qualified design professional, and on Engineer's review of the Application for Payment and the accompanying data and schedules, that to the best of Engineer's knowledge, information and belief:
  - a. the Work has progressed to the point indicated;

- b. the quality of the Work is generally in accordance with the Contract Documents (subject to an evaluation of the Work as a functioning whole prior to or upon Substantial Completion, the results of any subsequent tests called for in the Contract Documents, a final determination of quantities and classifications for Unit Price Work under Paragraph 9.07, and any other qualifications stated in the recommendation); and
    - c. the conditions precedent to Contractor's being entitled to such payment appear to have been fulfilled in so far as it is Engineer's responsibility to observe the Work.
  3. By recommending any such payment Engineer will not thereby be deemed to have represented that:
    - a. inspections made to check the quality or the quantity of the Work as it has been performed have been exhaustive, extended to every aspect of the Work in progress, or involved detailed inspections of the Work beyond the responsibilities specifically assigned to Engineer in the Contract Documents; or
    - b. there may not be other matters or issues between the parties that might entitle Contractor to be paid additionally by Owner or entitle Owner to withhold payment to Contractor.
  4. Neither Engineer's review of Contractor's Work for the purposes of recommending payments nor Engineer's recommendation of any payment, including final payment, will impose responsibility on Engineer:
    - a. to supervise, direct, or control the Work, or
    - b. for the means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or
    - c. for Contractor's failure to comply with Laws and Regulations applicable to Contractor's performance of the Work, or
    - d. to make any examination to ascertain how or for what purposes Contractor has used the moneys paid on account of the Contract Price, or
    - e. to determine that title to any of the Work, materials, or equipment has passed to Owner free and clear of any Liens.
  5. Engineer may refuse to recommend the whole or any part of any payment if, in Engineer's opinion, it would be incorrect to make the representations to Owner stated in Paragraph 14.02.B.2. Engineer may also refuse to recommend any such payment or, because of subsequently discovered evidence or the results of subsequent inspections or tests, revise or revoke any such payment recommendation previously made, to such extent as may be necessary in Engineer's opinion to protect Owner from loss because:
    - a. the Work is defective, or completed Work has been damaged, requiring correction or replacement;



- b. the Contract Price has been reduced by Change Orders;
- c. Owner has been required to correct defective Work or complete Work in accordance with Paragraph 13.09; or
- d. Engineer has actual knowledge of the occurrence of any of the events enumerated in Paragraph 15.02.A.

C. *Payment Becomes Due:*

1. ~~Ten~~ **Thirty (30)** days after presentation of the Application for Payment to Owner with Engineer's recommendation, the amount recommended will (subject to the provisions of Paragraph 14.02.D) become due, and when due will be paid by Owner to Contractor.

D. *Reduction in Payment:*

1. Owner may refuse to make payment of the full amount recommended by Engineer because:
  - a. claims have been made against Owner on account of Contractor's performance or furnishing of the Work;
  - b. Liens (**whether or not permissible**) have been filed in connection with the Work, except where Contractor has delivered a specific bond satisfactory to Owner to secure the satisfaction and discharge of such Liens;
  - c. there are other items entitling Owner to a set-off against the amount recommended **including but not limited to liquidated damages**; or
  - d. Owner has actual knowledge of the occurrence of any of the events enumerated in Paragraphs 14.02.B.5.a through 14.02.B.5.c or Paragraph 15.02.A.
2. If Owner refuses to make payment of the full amount recommended by Engineer, Owner will give Contractor immediate written notice (with a copy to Engineer) stating the reasons for such action and promptly pay Contractor any amount remaining after deduction of the amount so withheld. Owner shall promptly pay Contractor the amount so withheld, or any adjustment thereto agreed to by Owner and Contractor, when Contractor remedies the reasons for such action.
3. Upon a subsequent determination that Owner's refusal of payment was not justified, the amount wrongfully withheld shall be treated as an amount due as determined by Paragraph 14.02.C.1 and subject to interest as provided in the Agreement.

14.03 *Contractor's Warranty of Title*

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

#### 14.04 *Substantial Completion*

- A. When Contractor considers the entire Work ready for its intended use Contractor shall notify Owner and Engineer in writing that the entire Work is substantially complete (except for items specifically listed by Contractor as incomplete) and request that Engineer issue a certificate of Substantial Completion.
- B. Promptly after Contractor's notification, Owner, Contractor, and Engineer shall make an inspection of the Work to determine the status of completion. If Engineer does not consider the Work substantially complete, Engineer will notify Contractor in writing giving the reasons therefor.
- C. If Engineer considers the Work substantially complete, Engineer will deliver to Owner a **tentative preliminary** certificate of Substantial Completion which shall fix the date of Substantial Completion. There shall be attached to the certificate a tentative list of items to be completed or corrected before final payment. Owner shall have seven days after receipt of the tentative certificate during which to make written objection to Engineer as to any provisions of the certificate or attached list. If, after considering such objections, Engineer concludes that the Work is not substantially complete, Engineer will, within 14 days after submission of the tentative certificate to Owner, notify Contractor in writing, stating the reasons therefor. If, after consideration of Owner's objections, Engineer considers the Work substantially complete, Engineer will, within said 14 days, execute and deliver to Owner and Contractor a **definitive final** certificate of Substantial Completion (with a revised tentative list of items to be completed or corrected) reflecting such changes from the tentative certificate as Engineer believes justified after consideration of any objections from Owner.
- D. At the time of delivery of the tentative certificate of Substantial Completion, Engineer will deliver to Owner and Contractor a written recommendation as to division of responsibilities pending final payment between Owner and Contractor with respect to security, operation, safety, and protection of the Work, maintenance, heat, utilities, insurance, and warranties and guarantees. Unless Owner and Contractor agree otherwise in writing and so inform Engineer in writing prior to Engineer's issuing the definitive certificate of Substantial Completion, Engineer's aforesaid recommendation will be binding on Owner and Contractor until final payment.
- E. Owner shall have the right to exclude Contractor from the Site after the date of Substantial Completion subject to allowing Contractor reasonable access to remove its property and complete or correct items on the tentative list.

#### 14.05 *Partial Utilization*

- A. Prior to Substantial Completion of all the Work, Owner may use or occupy any substantially completed part of the Work which has specifically been identified in the Contract Documents, or which Owner, Engineer, and Contractor agree constitutes a separately functioning and usable part of the Work that can be used by Owner for its intended purpose without significant interference with Contractor's performance of the remainder of the Work, subject to the following conditions:
  1. Owner at any time may request Contractor in writing to permit Owner to use or occupy any such part of the Work which Owner believes to be ready for its intended use and substantially

complete. If and when Contractor agrees that such part of the Work is substantially complete, Contractor, Owner, and Engineer will follow the procedures of Paragraph 14.04.A through D for that part of the Work.

2. Contractor at any time may notify Owner and Engineer in writing that Contractor considers any such part of the Work ready for its intended use and substantially complete and request Engineer to issue a certificate of Substantial Completion for that part of the Work.
3. Within a reasonable time after either such request, Owner, Contractor, and Engineer shall make an inspection of that part of the Work to determine its status of completion. If Engineer does not consider that part of the Work to be substantially complete, Engineer will notify Owner and Contractor in writing giving the reasons therefor. If Engineer considers that part of the Work to be substantially complete, the provisions of Paragraph 14.04 will apply with respect to certification of Substantial Completion of that part of the Work and the division of responsibility in respect thereof and access thereto.
4. No use or occupancy or separate operation of part of the Work may occur prior to compliance with the requirements of Paragraph 5.10 regarding property insurance.

#### 14.06 *Final Inspection*

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

#### 14.07 *Final Payment*

##### A. *Application for Payment:*

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

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

*B. Engineer's Review of Application and Acceptance:*

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

*C. Payment Becomes Due:*

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

*14.08 Final Completion Delayed*

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

#### 14.09 *Waiver of Claims*

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

### **ARTICLE 15 – SUSPENSION OF WORK AND TERMINATION**

#### 15.01 *Owner May Suspend Work*

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

#### 15.02 *Owner May Terminate for Cause*

- A. The occurrence of any one or more of the following events will justify termination for cause:
1. Contractor's persistent failure to perform the Work in accordance with the Contract Documents (including, but not limited to, failure to supply sufficient skilled workers or suitable materials or equipment or failure to adhere to the Progress Schedule established under Paragraph 2.07 as adjusted from time to time pursuant to Paragraph 6.04);
  2. Contractor's disregard of Laws or Regulations of any public body having jurisdiction;
  3. Contractor's repeated disregard of the authority of Engineer; or
  4. Contractor's violation in any substantial way of any provisions of the Contract Documents.
- B. If one or more of the events identified in Paragraph 15.02.A occur, Owner may, after giving Contractor (and surety) seven days written notice of its intent to terminate the services of Contractor:
1. exclude Contractor from the Site, and take possession of the Work and of all Contractor's tools, appliances, construction equipment, and machinery at the Site, and use the same to the full extent they could be used by Contractor (without liability to Contractor for trespass or conversion);

2. incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere; and
  3. complete the Work as Owner may deem expedient.
- C. If Owner proceeds as provided in Paragraph 15.02.B, Contractor shall not be entitled to receive any further payment until the Work is completed. If the unpaid balance of the Contract Price exceeds all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by Owner arising out of or relating to completing the Work, such excess will be paid to Contractor. If such claims, costs, losses, and damages exceed such unpaid balance, Contractor shall pay the difference to Owner. Such claims, costs, losses, and damages incurred by Owner will be reviewed by Engineer as to their reasonableness and, when so approved by Engineer, incorporated in a Change Order. When exercising any rights or remedies under this Paragraph, Owner shall not be required to obtain the lowest price for the Work performed.
- D. Notwithstanding Paragraphs 15.02.B and 15.02.C, Contractor's services will not be terminated if Contractor begins within seven days of receipt of notice of intent to terminate to correct its failure to perform and proceeds diligently to cure such failure within no more than 30 days of receipt of said notice.
- E. Where Contractor's services have been so terminated by Owner, the termination will not affect any rights or remedies of Owner against Contractor then existing or which may thereafter accrue. Any retention or payment of moneys due Contractor by Owner will not release Contractor from liability.
- F. If and to the extent that Contractor has provided a performance bond under the provisions of Paragraph 5.01.A, the termination procedures of that bond shall supersede the provisions of Paragraphs 15.02.B and 15.02.C.

### 15.03 *Owner May Terminate For Convenience*

- A. Upon seven days written notice to Contractor and Engineer, Owner may, without cause and without prejudice to any other right or remedy of Owner, terminate the Contract. In such case, Contractor shall be paid for (without duplication of any items):
1. completed and acceptable Work executed in accordance with the Contract Documents prior to the effective date of termination, including fair and reasonable sums for overhead and profit on such Work;
  2. expenses sustained prior to the effective date of termination in performing services and furnishing labor, materials, or equipment as required by the Contract Documents in connection with uncompleted Work, plus fair and reasonable sums for overhead and profit on such expenses;
  3. all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other

dispute resolution costs) incurred in settlement of terminated contracts with Subcontractors, Suppliers, and others; and

4. reasonable expenses directly attributable to termination.

B. Contractor shall not be paid on account of loss of anticipated profits or revenue or other economic loss arising out of or resulting from such termination.

#### 15.04 *Contractor May Stop Work or Terminate*

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

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

### ARTICLE 16 – DISPUTE RESOLUTION

#### 16.01 *Methods and Procedures*

A. **In accordance with N.C.G.S. § 143-128(f1), Owner and Contractor agree to use the dispute resolution process adopted by the North Carolina State Building Commission pursuant to G.S. 143-135.26(11). This dispute resolution process will be available to all parties involved in the Project including Owner, Architect, Contractor, and the first-tier and lower-tier Subcontractors, and it shall be available for any issues arising out of the Contract or construction process, provided that the amount in controversy is \$15,000 or more. Contractor shall make this process available to its Subcontractors by inclusion of this provision in the Subcontractor agreements. Costs of the process will be divided between the parties to the dispute with at least one-third of the cost to be paid by Owner, if Owner is a party to the dispute. Participation in mediation concerning a dispute shall be a precondition to initiating litigation concerning the dispute.** Either Owner or Contractor may request mediation of any Claim submitted to Engineer for a decision under Paragraph 10.05 before such decision becomes final and binding. ~~The mediation will be governed by the Construction Industry Mediation Rules of the American Arbitration Association in effect as of the Effective Date of the Agreement.~~ The request for mediation shall be submitted in writing to the ~~American Arbitration Association and the~~ other party to the Contract. Timely submission of the request shall stay the effect of Paragraph 10.05.E.

- B. Owner and Contractor shall participate in the mediation process in good faith. The process shall be concluded within 60 days of filing of the request. The date of termination of the mediation shall be determined by application of the mediation rules referenced above.
- C. If the Claim is not resolved by mediation, Engineer's action under Paragraph 10.05.C or a denial pursuant to Paragraphs 10.05.C.3 or 10.05.D shall become final and binding 30 days after termination of the mediation unless, within that time period, Owner or Contractor:
- ~~1. elects in writing to invoke any dispute resolution process provided for in the Supplementary Conditions; or~~
  1. agrees with the other party to submit the Claim to another dispute resolution process; or
  2. gives written notice to the other party of the intent to submit the Claim to a court of competent jurisdiction.

## ARTICLE 17 – MISCELLANEOUS

### 17.01 *Giving Notice*

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

### 17.02 *Computation of Times*

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

### 17.03 *Cumulative Remedies*

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



17.04 *Survival of Obligations*

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

17.05 *Controlling Law*

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

17.06 *Headings*

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

17.07 *E-Verify*

**A. E-Verify is the federal program operated by the United States Department of Homeland Security and other federal agencies, or any successor or equivalent program, used to verify the work authorization of newly hired employees pursuant to federal law. Contractor shall ensure that Contractor and any Subcontractor performing work under this Contract: (i) uses E-Verify if required to do so; and (ii) otherwise complies with applicable law.**

17.08 *Iran Divestment Act*

**A. Pursuant to Article 6E of Chapter 147 of the North Carolina General Statutes, Owner must require most entities with which it contracts, which would include Contractor under this Contract, to certify that the entity is not identified on a list created by the State Treasurer pursuant to N.C.G.S. § 147-86.58 (the “Final Divestment List”). This requirement is related to ensuring that entities with which local governments contract are not involved in investment activities in Iran. Contractor certifies that: (i) it is not listed on the Final Divestment List, and (ii) it will not utilize any Subcontractor performing work under this Contract which is listed on the Final Divestment List.**

17.09 *Confidentiality*

**A. Contractor warrants and represents that Contractor shall not knowingly or negligently communicate or disclose at any time to any person or entity any information in connection with the Work or the Project (including, without limitation, information containing specific details of public security plans and arrangements or the detailed plans and drawings of public buildings and infrastructure facilities), except (i) with prior written consent of Owner, (ii) information that was in the public domain prior to the date of this Agreement, (iii) information that becomes part of the public domain by publication or otherwise not due to any unauthorized act or omission of Contractor, or (iv) as may be required to perform the Work by any applicable law, including any set of Drawings, Specifications, and other documents which Contractor is permitted to retain. Specific information shall not be deemed to fall**

within the scope of the foregoing exceptions merely because it is embraced by more generic information which falls within the scope of one or more of those exceptions. Contractor shall not disclose to others that specific information was received from Owner even though it falls within the scope of one or more of those exceptions. Contractor acknowledges and agrees that the existence of the Owner's particular interests and plans in the geographical area of the Project is a type of such specific information. In the event that Contractor is required by any court of competent jurisdiction or legally constituted authority to disclose any such of Owner's information, prior to any disclosure thereof, Contractor shall notify Owner and shall give Owner the opportunity to challenge any such disclosure order or to seek protection for those portions that it regards as confidential.

17.10 *Severability*

A. The provisions hereof are severable, and should any provision be determined to be invalid, unlawful or otherwise null and void by any court of competent jurisdiction, the other provisions shall remain in full force and effect and shall not thereby be affected unless such ruling shall make further performance hereunder impossible or impose an unconscionable burden upon one of the parties. The parties shall endeavor in good faith to replace the invalid, illegal, or unenforceable provisions with valid provisions the economic effect of which comes as close as practicable to that of the invalid, illegal, or unenforceable provisions.

## SUPPLEMENTARY CONDITIONS

These Supplementary Conditions amend or supplement the Standard General Conditions of the Construction Contract, EJCDC® C-700 (2007 Edition). All provisions that are not so amended or supplemented remain in full force and effect.

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

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 thereto.

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

#### SC-4.02 *Subsurface and Physical Conditions*

**SC 4.02 Add the following new paragraphs immediately after Paragraph 4.02.A:**

**The following reports of explorations or tests of subsurface conditions at or adjacent to the Site are known to Owner.**

**1. Report dated July 22, 2016, prepared by ESP Associates, P.A., Concord, NC, entitled “Report of Subsurface Exploration Union County Pipeline West Alignment”, consisting of 73 pages. It shall be understood that the information provided is not guaranteed by Owner or Engineer to be more than a general indication of the physical conditions likely to be found.**

**Contractor may examine copies of reports and drawings identified in SC 4.02.A that were not included with the Bidding Documents at the Issuing Office of Black & Veatch International Company during regular business hours or may request copies from the Engineer.**

#### SC-4.06 *Hazardous Environmental Conditions*

**SC 4.06 Delete Paragraphs 4.06.A and 4.06.B in their entirety and insert the following:**

- A. As noted on the Drawings, asbestos containing materials are present on the site and in the project area in the form of Asbestos Cement Pipe. The contractor shall take all precautions necessary to avoid disturbance of any asbestos containing materials. The contractor is responsible for all safety and health precautions for working near asbestos containing materials.**
- B. Not Used.**

## ARTICLE 6 – CONTRACTOR’S RESPONSIBILITIES

### *SC-6.02 Labor; Working Hours*

**SC-6.02.B. Add the following new subparagraphs immediately after Paragraph 6.02.B:**

1. Regular working hours are defined as, Monday through Friday, excluding Owner’s legal holidays, between the hours of 7:00 am and 6:00 pm.
2. Owner's legal holidays are:
  - a. New Year’s Day
  - b. Martin Luther King, Jr.’s Birthday
  - c. Good Friday
  - d. Memorial Day
  - e. Independence Day
  - f. Labor Day
  - g. Veterans Day
  - h. Thanksgiving Day
  - i. Day after Thanksgiving
  - j. Christmas Eve
  - k. Christmas Day
  - l. Day after Christmas

## ARTICLE 8 – OWNER’S RESPONSIBILITIES

**SC-8.06 Add the following new paragraph immediately after Paragraph 8.05 of the General Conditions:**

**SC-8.06 Owner will furnish an “Owner’s Site Representative” to represent Owner at the Site and assist Owner in observing the progress and quality of the Work. The Owner’s Site Representative is not Engineer’s consultant, agent, or employee.**

## ARTICLE 9 – ENGINEER’S STATUS DURING CONSTRUCTION

### *SC-9.03 Project Representative*

**SC-9.03 Add the following new paragraphs immediately after Paragraph 9.03.A:**

- B. The Resident Project Representative (RPR) will be Engineer's representative at the Site, will act as directed by and under the supervision of Engineer, and will confer with Engineer regarding RPR's actions.
  1. General: RPR's dealings in matters pertaining to the Work in general shall be with Engineer and Contractor. RPR's dealings with Subcontractors shall only be through or with the full knowledge and approval of Contractor. RPR shall generally communicate with Owner only with the knowledge of and under the direction of Engineer.

2. **Schedules:** Review the progress schedule, schedule of Shop Drawing and Sample submittals, and Schedule of Values prepared by Contractor and consult with Engineer concerning acceptability.
3. **Conferences and Meetings:** Attend meetings with Contractor, such as preconstruction conferences, progress meetings, job conferences, and other Project-related meetings, and prepare and circulate copies of minutes thereof.
4. **Liaison:**
  - a. Serve as Engineer's liaison with Contractor. Working principally through Contractor's authorized representative or designee, assist in providing information regarding the provisions and intent of the Contract Documents.
  - b. Assist Engineer in serving as Owner's liaison with Contractor when Contractor's operations affect Owner's on-Site operations.
  - c. Assist in obtaining from Owner additional details or information, when required for proper execution of the Work.
5. **Interpretation of Contract Documents:** Report to Engineer when clarifications and interpretations of the Contract Documents are needed and transmit to Contractor clarifications and interpretations as issued by Engineer.
6. **Shop Drawings and Samples:**
  - a. Record date of receipt of Samples and Contractor-approved Shop Drawings.
  - b. Receive Samples which are furnished at the Site by Contractor and notify Engineer of availability of Samples for examination.
  - c. Advise Engineer and Contractor of the commencement of any portion of the Work requiring a Shop Drawing or Sample submittal for which RPR believes that the submittal has not been approved by Engineer.
7. **Modifications:** Consider and evaluate Contractor's suggestions for modifications in Drawings or Specifications and report such suggestions, together with RPR's recommendations, if any, to Engineer. Transmit to Contractor in writing decisions as issued by Engineer.
8. **Review of Work and Rejection of Defective Work:**
  - a. Conduct On-Site observations of Contractor's work in progress to assist Engineer in determining if the Work is in general proceeding in accordance with the Contract Documents.
  - b. Report to Engineer whenever RPR believes that any part of Contractor's work in progress is defective, will not produce a

completed Project that conforms generally to the Contract Documents, or will imperil the integrity of the design concept of the completed Project as a functioning whole as indicated in the Contract Documents, or has been damaged, or does not meet the requirements of any inspection, test or approval required to be made; and advise Engineer of that part of work in progress that RPR believes should be corrected or rejected or should be uncovered for observation, or requires special testing, inspection or approval.

**9. Inspections, Tests, and System Start-ups:**

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

**10. Records:**

- a. Prepare a daily report or keep a diary or log book, recording Contractor's hours on the Site, Subcontractors present at the Site, weather conditions, data relative to questions of Change Orders, Field Orders, Work Change Directives, or changed conditions, Site visitors, deliveries of equipment or materials, daily activities, decisions, observations in general, and specific observations in more detail as in the case of observing test procedures; and send copies to Engineer.
- b. Record names, addresses, fax numbers, e-mail addresses, web site locations, and telephone numbers of all Contractors, Subcontractors, and major Suppliers of materials and equipment.
- c. Maintain records for use in preparing Project documentation.

**11. Reports:**

- a. Furnish to Engineer periodic reports as required of progress of the Work and of Contractor's compliance with the Progress Schedule and schedule of Shop Drawing and Sample submittals.
- b. Draft and recommend to Engineer proposed Change Orders, Work Change Directives, and Field Orders. Obtain backup material from Contractor.
- c. Immediately notify Engineer of the occurrence of any Site accidents, emergencies, acts of God endangering the Work, force majeure or delay events, damage to property by fire or other causes, or the discovery of any Constituent of Concern or Hazardous Environmental Condition.

12. **Payment Requests:** Review applications for payment with Contractor for compliance with the established procedure for their submission and forward with recommendations to Engineer, noting particularly the relationship of the payment requested to the Schedule of Values, Work completed, and materials and equipment delivered at the Site but not incorporated in the Work.
  13. **Certificates, Operation and Maintenance Manuals:** During the course of the Work, verify that materials and equipment certificates, operation and maintenance manuals and other data required by the Contract Documents to be assembled and furnished by Contractor are applicable to the items actually installed and in accordance with the Contract Documents, and have these documents delivered to Engineer for review and forwarding to Owner prior to payment for that part of the Work.
  14. **Completion:**
    - a. Participate in Engineer's visits to the Site to determine Substantial Completion, assist in the determination of Substantial Completion and the preparation of a punch list of items to be completed or corrected.
    - b. Participate in Engineer's final visit to the Site to determine completion of the Work, in the company of Owner and Contractor, and prepare a final punch list of items to be completed and deficiencies to be remedied.
    - c. Observe whether all items on the final list have been completed or corrected and make recommendations to Engineer concerning acceptance and issuance of the notice of acceptability of the work.
- C. The RPR shall not:
1. Authorize any deviation from the Contract Documents or substitution of materials or equipment (including "or-equal" items).
  2. Exceed limitations of Engineer's authority as set forth in the Contract Documents.
  3. Undertake any of the responsibilities of Contractor, Subcontractors, or Suppliers.
  4. Advise on, issue directions relative to, or assume control over any aspect of the means, methods, techniques, sequences or procedures of Contractor's work.
  5. Advise on, issue directions regarding, or assume control over security or safety practices, precautions, and programs in connection with the activities or operations of Owner or Contractor.

6. **Participate in specialized field or laboratory tests or inspections conducted off-site by others except as specifically authorized by Engineer.**
7. **Accept Shop Drawing or Sample submittals from anyone other than Contractor.**
8. **Authorize Owner to occupy the Project in whole or in part.**



**Work Change Directive No.**

Date of Issuance: \_\_\_\_\_ Effective Date: \_\_\_\_\_  
 Owner: **UNION COUNTY** Owner's Contract No.: WT-061  
 Contractor: \_\_\_\_\_ Contractor's Project  
 Engineer: Black & Veatch No.: \_\_\_\_\_ Engineer's Project No.: 186110  
 Project: 853W Zone Improvements – Phase I Contract Name: \_\_\_\_\_

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

Description:

Attachments: *[List documents supporting change]*

**Purpose for Work Change Directive:**

Directive to proceed promptly with the Work described herein, prior to agreeing to changes on Contract Price and Contract Time, is issued due to: *[check one or both of the following]*

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

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

Contract Price \$ \_\_\_\_\_ [increase] [decrease].  
 Contract Time \_\_\_\_\_ days [increase] [decrease].

**Basis of estimated change in Contract Price:**

- Lump Sum  Unit Price
- Cost of the Work  Other

RECOMMENDED:	AUTHORIZED BY:	RECEIVED:
By: _____	By: _____	By: _____
Engineer (Authorized Signature)	Owner (Authorized Signature)	Contractor (Authorized Signature)
Title: _____	Title: _____	Title: _____
Date: _____	Date: _____	Date: _____

Approved by Funding Agency (if applicable)

By: \_\_\_\_\_ Date: \_\_\_\_\_  
 Title: \_\_\_\_\_



# Change Order

No. \_\_\_\_\_

Date of Issuance: \_\_\_\_\_ Effective Date: \_\_\_\_\_

Project : 853W Zone Improvements - Phase I Transmission Mains	Owner: UNION COUNTY	Owner's Contract No.: WT-061
Contract:	Date of Contract:	
Contractor:	Engineer's Project No.: 186110	

**The Contract Documents are modified as follows upon execution of this Change Order:**

Description:

\_\_\_\_\_

\_\_\_\_\_

**Attachments (list documents supporting change):**

\_\_\_\_\_

\_\_\_\_\_

**CHANGE IN CONTRACT PRICE:**

**CHANGE IN CONTRACT TIMES:**

Original Contract Price:

\$ \_\_\_\_\_

Current Contract Price:

\$ \_\_\_\_\_

Contract Contingency:

\$ \_\_\_\_\_

Current Available Contingency:

\$ \_\_\_\_\_

Amount of this Change Order:

\$ \_\_\_\_\_

Change Order to be Funded Through:

Contingency  Contract Price

Contingency Incorporating this Change Order:

\$ \_\_\_\_\_

Contract Price Incorporating this Change Order:

\$ \_\_\_\_\_

Original Contract Times:  Working  Calendar Days  
Days

Substantial completion (days or date): \_\_\_\_\_

Ready for final payment (days or date): \_\_\_\_\_

Increase  Decrease from previously approved Change Orders  
No. \_\_\_\_\_ to No. \_\_\_\_\_:

Substantial completion (days): \_\_\_\_\_

Ready for final payment (days): \_\_\_\_\_

Contract Times Prior to this Change Order:

Substantial Completion (Days or Date): \_\_\_\_\_

Ready for Final Payment (Days or Date): \_\_\_\_\_

Increase  Decrease of this Change Order:

Substantial Completion Date (Days or Date): \_\_\_\_\_

Ready for Final Payment (Days or Date): \_\_\_\_\_

Contract Times with all approved Change Orders:

Substantial completion (days or date): \_\_\_\_\_

Ready for final payment (days or date): \_\_\_\_\_

**RECOMMENDED:**

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

Engineer (Authorized Signature)

Date: \_\_\_\_\_

Approved by Funding Agency

(if applicable): \_\_\_\_\_

**ACCEPTED:**

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

Owner (Authorized Signature)

Date: \_\_\_\_\_

**ACCEPTED:**

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

Contractor (Authorized Signature)

Date: \_\_\_\_\_

Date: \_\_\_\_\_

# Change Order

## Instructions

### A. GENERAL INFORMATION

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

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

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

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

### B. COMPLETING THE CHANGE ORDER FORM

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

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

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

# Field Order

No. \_\_\_\_\_

Date of Issuance: \_\_\_\_\_ Effective Date: \_\_\_\_\_

Project: 853W Zone Improvements – Phase I	Owner: UNION COUNTY	Owner's Contract No.: WT-061
Contract:		Date of Contract:
Contractor:		Engineer's Project No.: 186110

**Attention:**

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

Reference: \_\_\_\_\_  
(Specification Section(s)) (Drawing(s) / Detail(s))

Description:  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Attachments:  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Engineer: \_\_\_\_\_

Receipt Acknowledged by Contractor: \_\_\_\_\_ Date: \_\_\_\_\_

Copy to Owner









Section 01015

PROJECT REQUIREMENTS

1. GENERAL DESCRIPTION OF WORK. The Work to be performed under these Contract Documents is generally described as follows:

Furnish and install approximately 24,300 LF of 36" ductile iron water transmission pipeline and approximately 3,200 LF of 16" ductile iron water transmission pipeline along N. Rocky River Road and Secrest Short Cut Road in Union County including all associated fittings, valves, air release valve structures, blow-offs, tie-ins, interconnections, services, clearing, erosion control, cleaning, disinfection and testing, pipeline abandonment; and all other pipeline work shown on the Drawings and described in the Specifications.

2. UNITS OF MEASUREMENT. Both inch-pound (English) and SI (metric) units of measurement are specified herein; the values expressed in inch-pound units shall govern.

3. OFFSITE STORAGE. Offsite storage arrangements shall be approved by Owner for all materials and equipment not incorporated into the Work but included in Applications for Payment. Such offsite storage arrangements shall be presented in writing and shall afford adequate and satisfactory security and protection. Offsite storage facilities shall be accessible to Owner and Engineer.

4. SUBSTITUTES AND "OR-EQUAL" ITEMS. Provisions for evaluation of proposed "or-equal" items of materials or equipment are covered in Paragraph 7.04 of the General Conditions. Requests for review of equivalency will not be accepted by Engineer from anyone except Contractor, and such requests will not be considered until after the Effective Date of the Agreement.

Whenever the names of proprietary products or the names of particular manufacturers or vendors are used, it shall be understood that the words "or equal" following the enumeration, if not specifically stated, are implied.

5. PREPARATION FOR SHIPMENT. All materials shall be suitably packaged to facilitate handling and protect against damage during transit and storage. Painted surfaces shall be protected against impact, abrasion, discoloration, and other damage. All painted surfaces which are damaged prior to acceptance of equipment shall be repainted to the satisfaction of Engineer.

Each item, package, or bundle of material shall be tagged or marked as identified in the delivery schedule or on the Shop Drawings. Complete packing lists and bills of material shall be included with each shipment.

6. EASEMENTS AND RIGHTS-OF-WAY. The easements and rights-of-way for the pipelines will be provided by Owner. Contractor shall confine its construction operations within the limits indicated on the Drawings. Contractor shall use due care in placing construction tools, equipment, excavated materials, and pipeline materials and supplies in order to avoid damage to property and interference with traffic.

All easements shall be staked in the field by a professional land surveyor registered in North Carolina prior to the start of any land disturbing work.

6.01. On Private Property. Easements across private property are indicated on the Drawings. Contractor shall set stakes to mark the boundaries of construction easements across private property. The stakes shall be protected and maintained until completion of construction and cleanup.

The Owner has acquired permanent easements and temporary construction easements on private property for the construction of the Project as indicated on the Drawings. Such easements together with public street rights of ways comprise the sole areas where the contractor is allowed to work on the Project, or to use for mobilization, access, staging, storage, and other purposes associated with the Project.

Contractor shall not enter any private property outside the designated construction easement boundaries without written permission from the owner of the property.

Whenever the easement is occupied by crops which will be damaged by construction operations, Contractor shall notify the owner sufficiently in advance so that the crops may be removed before excavation or trenching is started. Contractor shall be responsible for all damage to crops outside the easement and shall make satisfactory settlement for the damage directly with the owner.

Where the line crosses fields which are leveled for irrigation or terraced, Contractor shall relevel irrigated fields and replace all terraces to their original or better condition, and to the satisfaction of the owner.

6.02. Work Within Highway and Railroad Rights-of-Way. Permits shall be obtained by Owner. All Work performed and all operations of Contractor, its employees, or Subcontractors within the limits of railroad and highway rights-of-way shall be in conformity with the requirements and be under the control

(through Owner) of the railroad or highway authority owning, or having jurisdiction over and control of, the right-of-way in each case.

7. OPERATION OF EXISTING FACILITIES. The existing facilities must be kept in continuous operation throughout the construction period. No interruption will be permitted which adversely affects the degree of service provided. Provided permission is obtained from Owner in advance, portions of the existing facilities may be taken out of service for short periods corresponding with periods of minimum service demands.

Contractor shall provide temporary facilities and make temporary modifications as necessary to keep the existing facilities in operation during the construction period.

Operation of valves or other appurtenances on existing utilities, when required, shall be by or under the direct supervision of the owning utility.

8. NOTICES TO OWNERS AND AUTHORITIES. Contractor shall, as provided in the General Conditions, notify owners of adjacent property and utilities when prosecution of the Work may affect them.

When it is necessary to temporarily deny access to property, or when any utility service connection must be interrupted, Contractor shall give notices sufficiently in advance to enable the affected persons to provide for their needs. Notices shall conform to any applicable local ordinance and, whether delivered orally or in writing, shall include appropriate information concerning the interruption and instructions on how to limit inconvenience caused thereby.

Utilities and other concerned agencies shall be notified at least 24 hours prior to cutting or closing streets or other traffic areas or excavating near underground utilities or pole lines.

9. LINES AND GRADES. All Work shall be done to the lines, grades, and elevations indicated on the Drawings.

Basic horizontal and vertical control points will be established or designated by Engineer to be used as datums for the Work. All additional survey, layout, and measurement work shall be performed by Contractor as a part of the Work.

Contractor shall provide an experienced instrument person, competent assistants, and such instruments, tools, stakes, and other materials required to complete the survey, layout, and measurement work. In addition, Contractor shall furnish, without charge, competent persons and such tools, stakes, and other materials as Engineer may require in establishing or designating control points, in

establishing construction easement boundaries, or in checking survey, layout, and measurement work performed by Contractor.

Contractor shall keep Engineer informed, a reasonable time in advance, of the times and places at which it wishes to do Work, so that horizontal and vertical control points may be established and any checking deemed necessary by Engineer may be done with minimum inconvenience to Engineer and minimum delay to Contractor.

Contractor shall remove and reconstruct work which is improperly located.

10. CONNECTIONS TO EXISTING FACILITIES. Unless otherwise specified or indicated, Contractor shall make all necessary connections to existing facilities, including structures, drain lines, and utilities such as water, sewer, gas, telephone, and electric. In each case, Contractor shall receive permission from Owner or the owning utility prior to undertaking connections. Contractor shall protect facilities against deleterious substances and damage.

Connections to existing facilities which are in service shall be thoroughly planned in advance, and all required equipment, materials, and labor shall be on hand at the time of undertaking the connections. Work shall proceed continuously (around the clock) if necessary to complete connections in the minimum time. Operation of valves or other appurtenances on existing utilities, when required, shall be by or under the direct supervision of the owning utility.

A work plan for each connection shall be submitted at least four weeks prior to the connection to existing facilities and accepted by Owner and Engineer prior to beginning the work. The work plan shall include at a minimum the horizontal and vertical location of the connection to the existing facility, location of isolation valves, the materials required for connection, and the schedule of work activities and duration. Additionally, Contractor shall provide notice to the Owner and Engineer at least 96 hours prior to the connection to existing facilities.

11. UNFAVORABLE CONSTRUCTION CONDITIONS. During unfavorable weather, wet ground, or other unsuitable construction conditions, Contractor shall confine its operations to work which will not be affected adversely by such conditions. No portion of the Work shall be constructed under conditions which would affect adversely the quality or efficiency thereof, unless special means or precautions are taken by Contractor to perform the Work in a proper and satisfactory manner.

12. CUTTING AND PATCHING. As provided in General Conditions, Contractor shall perform all cutting and patching required for the Work and as may be

necessary in connection with uncovering Work for inspection or for the correction of defective Work.

Contractor shall perform all cutting and patching required for and in connection with the Work, including but not limited to the following:

Removal of improperly timed Work.

Removal of samples of installed materials for testing.

Alteration of existing facilities.

Contractor shall provide all shoring, bracing, supports, and protective devices necessary to safeguard all Work and existing facilities during cutting and patching operations. Contractor shall not undertake any cutting or demolition which may affect the structural stability of the Work or existing facilities without Engineer's concurrence.

Materials shall be cut and removed to the extent indicated on the Drawings or as required to complete the Work. Materials shall be removed in a careful manner, with no damage to adjacent facilities or materials. Materials which are not salvable shall be removed from the site by Contractor.

All Work and existing facilities affected by cutting operations shall be restored with new materials, or with salvaged materials acceptable to Engineer, to obtain a finished installation with the strength, appearance, and functional capacity required. If necessary, entire surface shall be patched and refinished.

13. HAZARDOUS ENVIRONMENTAL CONDITIONS AT SITE. As noted on the Drawings, asbestos containing materials are present on the site and in the project area in the form of Asbestos Cement Pipe. The contractor shall take all precautions necessary to avoid disturbance of any asbestos containing materials. The contractor is responsible for all safety and health precautions for working near asbestos containing materials.

14. CLEANING UP. Contractor shall keep the premises free at all times from accumulations of waste materials and rubbish. Contractor shall provide adequate trash receptacles about the Site and shall promptly empty the containers when filled.

Construction materials, such as concrete forms and scaffolding, shall be neatly stacked by Contractor when not in use. Contractor shall promptly remove splattered concrete, asphalt, oil, paint, corrosive liquids, and cleaning solutions from surfaces to prevent marring or other damage.

Volatile wastes shall be properly stored in covered metal containers and removed daily.

Wastes shall not be buried or burned on the Site or disposed of into storm drains, sanitary sewers, streams, or waterways. All wastes shall be removed from the Site and disposed of in a manner complying with local ordinances and antipollution laws.

Adequate cleanup will be a condition for recommendation of progress payment applications.

15. APPLICABLE CODES. References in the Contract Documents to local codes mean the following:

- North Carolina Occupational Safety and Health Standards for General Industry.
- North Carolina Erosion and Sediment Control Requirements.
- North Carolina Department of Transportation Requirements.

Other standard codes which apply to the Work are designated in the Specifications.

16. PRECONSTRUCTION CONFERENCE. Prior to the commencement of Work at the Site, a preconstruction conference will be held at a mutually agreed time and place. The conference shall be attended by:

Contractor and its superintendent.

Principal Subcontractors.

Representatives of principal Suppliers and manufacturers as appropriate.

Engineer and its Resident Project Representative.

Representatives of Owner.

Government representatives as appropriate.

Others as requested by Contractor, Owner, or Engineer.

Unless previously submitted to Engineer, Contractor shall bring to the conference a preliminary schedule for each of the following:

Progress Schedule.

Procurement schedule.

Schedule of Shop Drawings and other submittals.

The purpose of the conference is to designate responsible personnel and establish a working relationship. Matters requiring coordination will be discussed and procedures for handling such matters established. The agenda will include:

Contractor's preliminary schedules.

Transmittal, review, and distribution of Contractor's submittals.

Processing Applications for Payment.

Maintaining record documents.

Critical Work sequencing.

Field decisions and Change Orders.

Use of premises, office and storage areas, security, housekeeping, and Owner's needs.

Major equipment deliveries and priorities.

Contractor's assignments for safety and first aid.

Engineer will preside at the conference and will arrange for keeping the minutes and distributing the minutes to all persons in attendance.

17. PROGRESS MEETINGS. Contractor shall schedule and hold regular progress meetings at least monthly and at other times as requested by Engineer or required by progress of the Work. Contractor, Engineer, and all Subcontractors active on the Site shall be represented at each meeting. Contractor may at its discretion request attendance by representatives of its Suppliers, manufacturers, and other Subcontractors.

Contractor shall preside at the meetings. Meeting minutes shall be prepared and distributed by Engineer. The purpose of the meetings will be to review the progress of the Work, maintain coordination of efforts, discuss changes in scheduling, and resolve other problems which may develop.

18. SITE ADMINISTRATION. Contractor shall be responsible for all areas of the Site used by it and by all Subcontractors in the performance of the Work. Contractor shall exert full control over the actions of all employees and other persons with respect to the use and preservation of property and existing facilities, except such controls as may be specifically reserved to Owner or others. Contractor shall have the right to exclude from the Site all persons who have no purpose related to the Work or its inspection, and may require all persons on the Site (except Owner's employees) to observe the same regulations as Contractor requires of its employees.

19. RECORD DRAWINGS. As stipulated in the General Conditions and Supplementary Conditions, Contractor shall maintain at the Site one record copy of all Drawings in good order and annotated to show changes made during construction. Contractor shall meet monthly with the Engineer to review the Record Drawings and verify they correctly reflect all changes made during the month. Maintaining updated Record Drawings will be a requirement for recommendation of Progress Payment Applications.

20. SEQUENCE OF CONSTRUCTION. Contractor shall develop a complete and comprehensive construction schedule in accordance with the Construction Scheduling section. Contractor shall address in its construction schedule the sequence of construction activities required for completion of the Work while keeping the existing facilities in operation.

Contractor shall incorporate the following limitations and requirements in the construction schedule.

The following sequence of construction is suggested for the completion of the Work. The Contractor is responsible for evaluating this suggested sequence of construction and developing a construction plan. The Contractor shall make any adjustments to the suggested sequence of construction required for the successful completion of the project.

Stake permanent easements and locate existing utilities. Install 36" and 16" pipeline including all valves, blow-offs, air-release valves and other appurtenances. Pressure and leakage test pipelines in sections against the gate valves installed. Clean and disinfect pipeline. Connect to existing 36" pipeline at the Watkins Road Pumping Station site. Install and connect all 36", 16", 8" and 6" interconnections and services. Abandon existing water mains.

21. SUBSTANTIAL COMPLETION. Substantial Completion shall be as specified in the General Conditions and Supplementary Conditions and supplemented below for this Project. "Substantial Completion" means that the pipelines are completed to the point that they may be placed into continuous



operation. To be considered substantially complete, the following portions of the Work must be complete:

- All Pipeline installation including services
- All valve installation
- Pressure, leakage, cleaning and disinfection testing
- Connections to existing facilities
- Pipeline abandonment

22. INSURANCE. The following provisions shall be provided in addition to those specified in other sections.

22.01. Engineer as Additional Insured. Comprehensive Automobile Liability Insurance, Commercial general Liability insurance, and Umbrella Liability Insurance shall also include Engineer as additional insureds with the same protections as provided the Owner.

22.02. CSX AGREEMENT INSURANCE REQUIREMENTS. This insurance shall be provided as required by the CSX Facility Encroachment Agreement attached to this section.

23. PERMITS. Owner and Engineer will obtain the following permits:

- a) NCDEQ Public Water Supply Permit.
- b) NCDOT Highway Encroachment Agreement.
- c) NCDEQ 401 Water Quality Certification.
- d) USACE Section 404 Permit
- e) NCDEQ Erosion Control/Stormwater.
- f) CSX Railroad Encroachment Agreement.
- g) City of Monroe Utility Encroachment Agreement
- h) Duke Energy Transmission Line Letter of No Objection
- i) Piedmont Natural Gas/Duke Energy Gas Encroachment Agreement

A copy of these permits is included at the end of this section. Contractor shall be responsible for complying with all the terms and special conditions of these permits.

End of Section



## **APPENDIX A – NCDEQ Public Water Supply Permit**





NORTH CAROLINA  
*Environmental Quality*

ROY COOPER

*Governor*

MICHAEL S. REGAN

*Secretary*

S. DANIEL SMITH

*Director*

November 18, 2020

Union County

Attention: John Shutak, CIP Program Manager

500 North Main Street, Suite 600

Monroe, North Carolina 28112

Re: Engineering Plans and Specifications Approval  
Distribution Extension  
853W Zone Improvements - Phase I Transmission  
Mains  
Union County Water System  
Water System No.: NC0190413, Union County  
Serial No.: 20-00658

Dear Applicant:

Enclosed please find one copy of the "Application for Approval..." together with one copy of the referenced engineering plans and specifications bearing the Division of Water Resources stamp of approval for the referenced project. These engineering plans and specifications are approved under Division of Water Resources Serial Number 20-00658, dated November 18, 2020. **This approval has the following conditions:**

- 1. The necessary encroachment approval must be obtained prior to installation of proposed water main within the depicted Duke Energy natural gas transmission easement.**
- 2. Proper stream and wetland impact permit/approval(s) must be obtained before installing the proposed water main within the depicted 13 impact sites.**
- 3. In areas where water pressure exceeds 100 psi, applicable design standards and the operation and maintenance procedures for higher pressure water mains shall be implemented to maintain integrity of the distribution system and normal working pressure to the service lines.**
- 4. Contact the Department of Health and Human Services (DHHS) Health Hazards Control Unit Asbestos Program regarding the work related to asbestos cement pipe.**

Engineering plans and specifications prepared by Patrick Stout, P.E., call for the installation of approximately 24,280 feet of 36-inch water transmission main, 3,190 feet of 16-inch water transmission main, 100 feet of 8-inch water main, 200 feet of 6-inch water main fire hydrants, valves, and associated appurtenances along N Rocky River Road (SR 1007), Secrest Short Cut Road (SR 1501) and utility easements to interconnect existing Union County water mains. The proposed 36-inch water main will connect to an existing 36-inch water main along N Rocky River Road at a location approximately 100 feet north of the intersection with Price Short Cut Road (SR 1351). The proposed 36-inch water main will connect to an existing 16-inch water main along N.



North Carolina Department of Environmental Quality | Division of Water Resources

512 North Salisbury Street | 1634 Mail Service Center | Raleigh, North Carolina 27699-1634

919.707.9100

Rocky River Road at a location approximately 330 feet north of the intersection with Goldmine Road (SR 1162), at a location approximately 470 feet south of the intersection with Old Charlotte Highway (SR 1009), at a location approximately 270 feet north of the intersection with Old Charlotte Highway and at a location approximately 350 feet south of the intersection with Highway 74. The proposed 8-inch water main will connect to an existing 8-inch water main along Haywood Road at the intersection with Secrest Short Cut Road (SR 1513). Existing 16-inch water main along N Rocky River Road will be abandoned in place from a location approximately 320 feet north of the intersection with Goldmine Road north to a location approximately 470 feet south of the intersection with Old Charlotte Highway and from a location approximately 270 feet north of the intersection with Old Charlotte Highway to a location approximately 350 feet south of the intersection with Highway 74. Existing 8-inch and 2-inch water mains will be abandoned in place along Secrest Short Cut Road between Haywood Road and N Rocky River Road.

Please note that in accordance with 15A NCAC 18C .0309(a), no construction, alteration, or expansion of a water system shall be placed into service or made available for human consumption until the Public Water Supply Section has issued Final Approval. Final Approval will be issued and mailed to the applicant upon receipt of both an Engineer's Certification and an Applicant's Certification submitted in accordance with 15A NCAC 18C .0303 (a) and (c).

These plans and specifications in the foregoing application are approved insofar as the protection of public health is concerned as provided in the rules, standards and criteria adopted under the authority of Chapter 130A-317 of the General Statutes. This approval does not constitute a warranty of the design, construction or future operation of the water system.

One copy of the "Application for Approval..." and a copy of the plans and specifications with a seal of approval from the department are enclosed. One copy of the approved documents in a digital format (CD) is being forwarded to our Mooresville Regional Office. The second copy of the CD is being retained in our office.

If the Public Water Supply Section can be of further service, please call (919) 707-9100.

Sincerely,

 /for

Robert W. Midgette, P.E.  
Chief, Public Water Supply Section

RWM/SB

Enclosures: Approval Documents

cc: Clinton Cook, P.E., Mooresville Regional Office  
Union County Health Department  
Black & Veatch



NORTH CAROLINA  
Environmental Quality

November 18, 2020

ROY COOPER

Governor

MICHAEL S. REGAN

Secretary

S. DANIEL SMITH

Director

Union County

ATTN: John Shutak, CIP Program Manager

500 N. Main Street, Suite 600

Monroe, North Carolina 28112

Re: **Authorization to Construct (This is not a Final Approval)**

Issue Date: November 18, 2020

853W Zone Improvements – Phase I Transmission Mains

Serial No.: 20-00658 Union County

Water System No.: NC0190413

Water System Name: Union County

Dear Applicant:

This letter is to confirm that a complete Engineer's Report and a Water System Management Plan have been received, and that engineering plans and specifications have been approved by the Department for **853W Zone Improvements – Phase I Transmission Mains, Serial No.: 20-00658**. **This authorization to construct is granted with the following condition: The necessary encroachment approval must be obtained prior to installation of proposed water main within the depicted Duke Energy natural gas transmission easement and proper stream and wetland impact permit/approval(s) must be obtained before installing the proposed water main within the depicted 13 impact sites.**

The "Authorization to Construct" is valid for 36 months from the issue date. Authorization to construct may be extended if the Rules Governing Public Water Supplies and site conditions have not changed (see Rule .0305). The "Authorization to Construct" and the engineering plans and specifications approval letter shall be posted at the primary entrance of the job site before and during construction.

Upon completion of the construction or modification, **and prior to placing the new construction or modification into service**, the applicant must submit an Engineer's Certification and Applicant's Certification to the Public Water Supply Section.

- **Engineer's Certification:** in accordance with Rule .0303 (a), the applicant shall submit a certification statement signed and sealed by a registered professional engineer stating that construction was completed in accordance with approved engineering plans and specifications, including any provisions stipulated in the Department's engineering plan and specification approval letter.
- **Applicant's Certification:** in accordance with Rule .0303 (c), the applicant shall submit a signed certification statement indicating that the requirements for an Operation and Maintenance Plan and Emergency Management Plan have been satisfied in accordance with Rule .0307 (d) and (e) and that the system has a certified operator in accordance with Rule .1300. The "Applicant's Certification" form is available at <http://www.ncwater.org/> (click on Public Water Supply Section, Plan Review, Plan Review Forms).

Certifications can be sent by mail, fax (919-715-4374) or attachment to an e-mail message to **PWSSection.PlanReview@ncdenr.gov**.

Once the certifications are received and determined adequate, the Department will issue a Final Approval letter to the applicant. In accordance with Rule .0309 (a), no portion of this project shall be placed into service until the Department has issued Final Approval. Please contact us at (919) 707-9100 if you have any questions or need additional information.

Sincerely,

Robert W. Midgette, P.E.

Chief, Public Water Supply Section

cc: Clinton Cook, P.E., Regional Engineer  
Black & Veatch



North Carolina Department of Environmental Quality | Division of Water Resources  
512 North Salisbury Street | 1634 Mail Service Center | Raleigh, North Carolina 27699-1634  
919.707.9100

North Carolina Department of Environmental Quality  
Division of Water Resources

Authorization to Construct

Project Applicant: **UNION COUNTY**

Public Water System Name  
And Water System No.: **UNION COUNTY  
NC0190413**

Project Name: **853W ZONE IMPROVEMENTS – PHASE I TRANSMISSION  
MAINS**

Serial No.: **20-00658**

Issue Date: **NOVEMBER 18, 2020**

Expiration Date: **36 Months after Issue Date**

In accordance with NCAC 18C .0305, this Authorization to Construct must be posted  
at the primary entrance to the job site during construction.



PATRICK STOUT, P.E.  
BLACK & VEATCH  
175 REGENCY WOODS PLACE, SUITE 200  
CARY, NC 27518



# **APPENDIX B – NCDOT Highway Encroachment Agreement**





STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION

ROY COOPER  
GOVERNOR

JAMES H. TROGDON, III  
SECRETARY

July 31, 2019

COUNTY: Union

SUBJECT: Encroachment Contract #E103-090-18-00120 – Union County Public Works

Michael Lancaster  
Acting County Manager  
Union County Public Works  
500 North Main Street, Suite 400  
Monroe, NC 28112

Dear Mr. Lancaster:

Attached for your files is a copy of the above-referenced Right of Way Encroachment Contract, properly executed. This contract covers the following:

Installation of approximately 25,000LF of 36inch ductile iron water pipe and 9,100LF of 16inch ductile iron water pipe and appurtenances beginning at the intersection SR 1501(Secret Short Cut Road) and Unionville-Indian Trail Road) continuing southeast along SR 1501 to SR 1007 (North Rocky River Road) then south along SR 1007 to just north of SR 1351 (Price Short Cut Road). The proposed 36inch water line also connects to an existing 24inch water line on SR 1162 (Goldmine Road).

PROVISIONALLY APPROVED SUBJECT TO: Attached Special Provisions and submittal of Positive Shoring details submitted for review and approval by the District Engineer prior to construction. The District Engineer requires the encroaching party to provide a qualified inspector for the installation of this encroachment.

Carl Barclay, MPA, PE  
State Utilities Manager

DocuSigned by:  
  
C1AAA5BAEDS4457...

Larry D. Sanders, MGIST, PE  
State Encroachments Engineer

LDS/dhp  
Attachment

Mailing Address:  
NC DEPARTMENT OF TRANSPORTATION  
1555 MAIL SERVICE CENTER  
RALEIGH, NC 27699-1555

Telephone: (919) 707-6690  
Fax: (919) 250-4151  
Customer Service: 1-877-368-4968

Website: [www.ncdot.gov](http://www.ncdot.gov)

Location:  
1000 BIRCH RIDGE DRIVE  
RALEIGH, NC 27610

SPECIAL PROVISIONS  
R/W 16.1  
Union County Public Works  
E103-090-18-00120

**WORK ZONE TRAFFIC CONTROL QUALIFICATIONS AND TRAINING PROGRAM**

All personnel performing any activity inside the highway right of way are required to be familiar with the NCDOT Maintenance / Utility Traffic Control Guidelines (MUTCG). No specific training course or test is required for qualification in the Maintenance /Utility Traffic Control Guidelines (MUTCG).

All flagging, spotting, or operating Automated Flagger Assist Devices (AFAD) inside the highway right of way requires qualified and trained Work Zone Flaggers. Training for this certification is provided by NCDOT approved training resources and by private entities that have been pre-approved to train themselves.

All personnel in charge of overseeing work zone Temporary Traffic Control operations and installations inside the highway right of way are required to be qualified and trained Work Zone Supervisors. Training for this certification is provided by NCDOT approved training resources.

For questions and/or additional information regarding this training program please refer to our web site at <https://connect.ncdot.gov/projects/WZTC/Pages/Training.aspx> or call J.S. (Steve) Kite, PE at (919) 814-4937 or [skite@ncdot.gov](mailto:skite@ncdot.gov) or Roger Garrett at (919) 814-5045 or [rmgarrett@ncdot.gov](mailto:rmgarrett@ncdot.gov), both with the NCDOT Work Zone Traffic Control Section.

1. The encroaching party shall notify the District Engineer's office at telephone (704) 218-5100 prior to beginning construction and after construction is complete.
2. An executed copy of this encroachment agreement shall be present at the construction site at all times during construction. If safety or traffic conditions warrant such an action, NCDOT reserves the right to further limit, restrict or suspend operations within the right of way.
3. NCDOT does not guarantee the right of way on this road, nor will it be responsible for any claim for damages brought about by any property owner by reason of this installation.
4. The encroaching party is required to contact the appropriate Utility Companies involved and make satisfactory arrangements to adjust the utilities in conflict with the proposed work prior to beginning construction.
5. Excavation within 1000 feet of a signalized intersection will require notification by the encroaching party to the Division Traffic Engineer at telephone number (704) 983-4400. All traffic signal or detection cables must be located prior to excavation. Cost to replace or repair NCDOT signs, signals, or associated equipment shall be the responsibility of the encroaching party.
6. The encroaching party shall comply with all applicable Federal, State and local environmental regulations and shall obtain all necessary Federal, State and local environmental permits, including but not limited to, those related to sediment control, stormwater, wetland, streams, endangered species and historical sites.

7. Transportation Improvement Project (T.I.P.) U-5764 is scheduled for completion in the future and TIP U-5703 is currently active. Work within U-5703 (Sheet C17) cannot begin until permission has been granted by the District Engineer. Any encroachment determined to be in conflict with the construction of this project shall be removed and/or relocated at the owner's expense. Upon completion of the installation of this encroachment, three (3) copies of the "As Built" plans, sealed, signed and dated by a North Carolina Professional Engineer shall be submitted to the District Engineer, who in turn will forward two (2) copies to the Utilities Unit for their files. Failure to submit "As Built" plans within 2 weeks after completion of construction will result in the automatic revocation of this encroachment agreement.
8. The contractor shall not begin the construction until after the traffic control and erosion control devices have been installed to the satisfaction of the District Engineer.
9. Trenching, bore pits and/or other excavations shall not be left open or unsafe overnight.
10. The Contractor shall comply with all OSHA requirements and provide a competent person on site to supervise excavation at all times.
11. All fill areas/backfill shall be compacted to 95% density in accordance with AASHTO T99 as modified by the NCDOT. All material to a depth of 8 inches below the finished surface of the subgrade shall be compacted to a density equal to at least 100% of that obtained by compacting a sample of the material in accordance with AASHTO T99 as modified by the Department. The subgrade shall be compacted at a moisture content which is approximately that required to produce the maximum density indicated by the above test method. The contractor shall dry or add moisture to the subgrade when required to provide a uniformly compacted and acceptable subgrade.
12. Vegetative cover shall be established on all disturbed areas in accordance with the recommendations of the Division Roadside Environmental Engineer.
13. Proper temporary and permanent measures shall be used to control erosion and sedimentation in accordance with all local, State and Federal regulations.
14. All materials and workmanship shall conform to the NCDOT Standards and Specifications for Roads and Structures.
15. Strict compliance with the Policies and Procedures for Accommodating Utilities on Highway Rights of Way manual shall be required.
16. The resetting of the Control of Access fence shall be in accordance with the applicable NCDOT standard and as directed by the District Engineer.
17. Excavation material shall not be placed on pavement. Drainage structures shall not be blocked with excavation materials. Any drainage structure disturbed or damaged shall be restored to its original condition as directed by the District Engineer.
18. Any disturbed guardrail shall be reset according to the applicable standard or as directed by the District Engineer.
19. All driveways altered during construction shall be returned to a state comparable with the condition of the driveways prior to construction.

20. Right of Way monuments disturbed during construction shall be referenced by a registered Land Surveyor and reset after construction.
21. All roadway signs that are removed due to construction shall be reinstalled as soon as possible.
22. The party of the second part agrees to provide traffic control devices, lane closures, road closures, positive protection and/or any other warning or positive protection devices necessary for the safety of road users during construction and subsequent maintenance. This shall be performed in conformance with the latest NCDOT Roadway Standard Drawings and Standard Specifications for Roads and Structures and amendments or supplements thereto. When there is no guidance provided in the NCDOT Roadway Standard Drawings and Standard Specifications for Roads and Structures, comply with the Manual on Uniform Traffic Control Devices for Streets and Highways and amendments or supplements thereto. Information as to the above rules and regulations may be obtained from the NCDOT Division Engineer.
23. All lanes of traffic are to be open during the hours of 6:00 A.M. to 9:00 A.M. and from 4:00 P.M. to 6:00 P.M., or as designated by the District Engineer. Traffic shall be maintained at all times.
24. Ingress and egress shall be maintained to all businesses and dwellings affected by the project. Special attention shall be paid to police and fire stations, fire hydrants and hospitals.
25. Any work requiring equipment or personnel within 5' of the edge of any travel lane of an undivided facility and within 10' of the edge of any travel lane of a divided facility shall require a lane closure with appropriate tapers.
26. Work requiring lane or shoulder closures shall not be performed on both sides of the road simultaneously within the same area.
27. No parking or material storage shall be allowed along the shoulders of any state- maintained roadway.
28. During non-working hours, equipment shall be parked as close to the right of way line as possible and be properly barricaded in order not to have any equipment obstruction within the Clear Recovery Area.
29. The utility shall be installed within 5 feet of the right of way line and outside the theoretical 1:1 slope from the edge of pavement to the bottom of the nearest excavation wall. When this is not possible, excavation inside the theoretical 1:1 slope from the existing edge of pavement to the bottom of the nearest excavation wall shall be made in accordance with the following conditions:
  - a. Positive excavation shoring, such as sheet piling, shall be installed. The design of the shoring shall include the effects of traffic loads. The shoring system shall be designed and sealed by a licensed North Carolina Professional Engineer. Shoring plans and design calculations shall be submitted to the Division Engineer for review and approval prior to construction. **Trench boxes shall not be accepted as positive shoring.**
  - b. The trench backfill material shall meet the Statewide Borrow Criteria. The trench shall be backfilled in accordance with Section 300-7 of the 2012 NCDOT Standard Specifications for Roads and Structures, which basically requires the backfill material to be placed in layers not to exceed 6 inches loose and compacted to at least 95% of the density obtained by compacting a sample in accordance with ASSHTO T99 as modified by DOT.



- c. A qualified NCDOT inspector shall be on the site at all times during construction. The encroaching party shall reimburse NCDOT for the cost of providing the inspector. If NCDOT cannot supply an inspector, the encroaching party (not the utility contractor) should make arrangements to have a qualified inspector, under the supervision of a licensed North Carolina Professional Engineer, on the site at all times. The Professional Registered Engineer shall certify that the utility was installed in accordance with the encroachment agreement and that the backfill material meets the Statewide Borrow Criteria.
  - d. All trench excavation inside the limits of the theoretical one-to-one slope, as defined by the policy, shall be completely backfilled and compacted at the end of each construction day. No portion of the trench shall be left open overnight.
  - e. Active shoring details must be submitted to the District Engineer's office for review and approval prior to construction. The depth of the trench exceeds 10 feet and is within the 1:1 slope from the edge of pavement (Sheet C5).
- 30. All utility access points, such as manholes, splice boxes and junction boxes shall be located at or outside the right of way line. Manholes, splice boxes, junction boxes and vaults shall not be placed in the ditch line, side slopes of the ditches or in the pavement. All manholes, splice boxes, junction boxes and vaults and covers shall be flush with the ground when located within the vehicle recovery area.
- 31. All utility facilities, including manholes, valve boxes, meter boxes, splice boxes, junction boxes, vaults and access covers, within NCDOT right of way shall have been designed for HS-20 loading rated for continuous traffic. A listing of currently approved manholes and vaults is available a <https://apps.dot.state.nc.us/vendor/approvedproducts>. If any proposed structure is not of a design pre-approved by NCDOT, the encroaching party shall submit details and design calculations signed and sealed by a Professional Engineer for approval prior to construction.
- 32. Any pavement replacement or repair required due to this installation shall be the responsibility of the encroaching party. Pavement repair or replacement shall be in accordance with the requirements of and to the satisfaction of the District Engineer
- 33. Any utility marker required shall be as close to the Right of Way line as possible. If it is not feasible to install markers at or near right of way specific written approval shall be obtained from NCDOT prior to installation.
- 34. This agreement does not give permission to work on Railroads Right of Way. A separate permit from the Railroad Company is needed.
- 35. The work depicted on the plans and the specifications submitted with the encroachment package appear to be an engineering design held out to the public. The engineering work appears to affect the public safety and health. As such, the engineering drawings and specifications are required by GS-89C to be properly certified by a licensed North Carolina Professional Engineer. The plans and specifications submitted have not been properly certified by a licensed North Carolina Professional Engineer and the encroaching party may be in violation of GS-89C.
- 36. Note that this review is intended for the general conformance with the policies and procedures concerning the protection of current and potential future facilities located within the NCDOT rights of way and easements. This review and associated plan comments in no way construes any design, design change, or change in the intent of the design by the Owner, Design Engineer, or any of their representatives.

-AND-

Union County Public Works

500 N. Main St., Ste 400

Monroe, NC 28112

7/31/2019

THIS AGREEMENT, made and entered into this the \_\_\_\_\_ day of \_\_\_\_\_ 20\_\_\_\_ by and between the Department of Transportation, party of the first part; and Union County Public Works \_\_\_\_\_ party of the second part,

## WITNESSETH

THAT WHEREAS, the party of the second part desires to encroach on the right of way of the public road designated as Route(s) US 74, SR-1007, SR-1009, SR-1162, SR-1501, SR-1514, SR-3668, located in Monroe, NC (Union County)

**36-inch DIP Water Transmission Main:** Beginning approximately 100 feet north of the intersection of SR-1351 (Price Short Cut Rd) and SR-1007 (Rocky River Rd) and running north along the east side of SR-1007 (Rocky River Rd) for approximately 2,560 feet, crossing SR-1007 (Rocky River Rd) and continuing north along the west side of SR-1007 (Rocky River Rd) for approximately 2,190 feet, crossing SR-1162 (Goldmine Rd) at SR-1007 (Rocky River Rd) and continuing north along the west side of SR-1007 (Rocky River Rd) for approximately 6,210 feet, crossing SR-3668 (Aeropointe Pkwy) and SR-1007 (Rocky River Rd), and continuing north along the east side of SR-1007 (Rocky River Rd) for approximately 11,390 feet, crossing SR-1009 (NC Hwy 49), US 74, and SR-1514 (N Rocky River Rd), and terminating approximately 200 feet south of the intersection SR-1514 (N Rocky River Rd) and SR-1501 (Secrest Short Cut Rd).

**16-inch DIP Water Transmission Main:** Beginning approximately 200 feet south of the intersection of SR-1514 (N Rocky River Rd) and SR-1501 (Secrest Short Cut Rd) and running northwest along the west side of SR-1501 (Secrest Short Cut Rd) for approximately 2,560 feet, crossing SR-1501 (Secrest Short Cut Rd) and continuing north along the east side of SR-1501 (Secrest Short Cut Rd) for approximately 2,190 feet and terminating approximately 850 feet south of the intersection SR-1501 (Secrest Short Cut Rd) and SR-1367 (Unionville-Indian Trail Rd).

with the construction and/or erection of:

(a) 25,000 LF of 36-inch DIP water transmission main with appurtenances installed via open cut routed inside and parallel of the right-of-way of SR-1007 (Rocky River Rd) with bore and jack crossings for all NCDOT roadways; (b) 903 LF of 36-inch DIP water transmission main within 54-inch steel encasement pipe installed by bore and jack crossing SR-1007, SR-1162, SR-3668, SR-1007, SR-1009, US 74, and SR-1514; (c) 42 LF of 16-inch DIP water transmission main within 30-inch steel encasement pipe installed by bore and jack crossing SR-1007; (d) 9,000 LF of 16-inch DIP water transmission main with appurtenances installed via open cut routed inside and parallel of the right-of-way of SR-1501 (Secrest Short Cut Rd) with bore and jack crossings for all NCDOT roadways; (e) 56 LF of 16-inch DIP water transmission main within 30-inch steel encasement pipe installed by bore and jack crossing SR-1501.

WHEREAS, it is to the material advantage of the party of the second part to effect this encroachment, and the party of the first part in the exercise of authority conferred upon it by statute, is willing to permit the encroachment within the limits of the right of way as indicated, subject to the conditions of this agreement;

NOW, THEREFORE, IT IS AGREED that the party of the first part hereby grants to the party of the second part the right and privilege to make this encroachment as shown on attached plan sheet(s), specifications and special provisions which are made a part hereof upon the following conditions, to wit:

That the installation, operation, and maintenance of the above described facility will be accomplished in accordance with the party of the first part's latest POLICIES AND PROCEDURES FOR ACCOMMODATING UTILITIES ON HIGHWAY RIGHTS-OF-WAY, and such revisions and amendments thereto as may be in effect at the date of this agreement. Information as to these policies and procedures may be obtained from the Division Engineer or State Utility Agent of the party of the first part.

That the said party of the second part binds and obligates himself to install and maintain the encroaching facility in such safe and proper condition that it will not interfere with or endanger travel upon said highway, nor obstruct nor interfere with the proper maintenance thereof, to reimburse the party of the first part for the cost incurred for any repairs or maintenance to its roadways and structures necessary due to the installation and existence of the facilities of the party of the second part, and if at any time the party of the first part shall require the removal of or changes in the location of the said facilities, that the said party of the second part binds himself, his successors and assigns, to promptly remove or alter the said facilities, in order to conform to the said requirement, without any cost to the party of the first part.

That the party of the second part agrees to provide during construction and any subsequent maintenance proper signs, signal lights, flagmen and other warning devices for the protection of traffic in conformance with the latest Manual on Uniform Traffic Control Devices for Streets and Highways and Amendments or Supplements thereto. Information as to the above rules and regulations may be obtained from the Division Engineer of the party of the first part.

That the party of the second part hereby agrees to indemnify and save harmless the party of the first part from all damages and claims for damage that may arise by reason of the installation and maintenance of this encroachment.

That the party of the second part agrees to restore all areas disturbed during installation and maintenance to the satisfaction of the Division Engineer of the party of the first part. The party of the second part agrees to exercise every reasonable precaution during construction and maintenance to prevent eroding of soil; silting or pollution of rivers, streams, lakes, reservoirs, other water impoundments, ground surfaces or other property; or pollution of the air. There shall be compliance with applicable rules and regulations of the North Carolina Division of Environmental Management, North Carolina Sedimentation Control Commission, and with ordinances and regulations of various counties, municipalities and other official agencies relating to pollution prevention and control. When any

That in the case of noncompliance with the terms of this agreement by the party of the second part, the party of the first part reserves the right to stop all work until the facility has been brought into compliance or removed from the right of way at no cost to the party of the first part.

That it is agreed by both parties that this agreement shall become void if actual construction of the work contemplated herein is not begun within one (1) year from the date of authorization by the party of the first part unless written waiver is secured by the party of the second part from the party of the first part.

During the performance of this contract, the second party, for itself, its assignees and successors in interest (hereinafter referred to as the "contractor"), agrees as follows:

- a. **Compliance with Regulations:** The contractor shall comply with the Regulations relative to nondiscrimination in Federally-assisted programs of the U. S. Department of Transportation, Title 49, Code of Federal Regulations, Part 21, as they may be amended from time to time, (hereinafter referred to as the Regulations), which are herein incorporated by reference and made a part of this contract.
- b. **Nondiscrimination:** The contractor, with regard to the work performed by it during the contract, shall not discriminate on the grounds of race, color, or national origin in the selection and retention of subcontractors, including procurements of materials and leases of equipment. The contractor shall not participate either directly or indirectly in the discrimination prohibited by Section 21.5 of the Regulations, including employment practices when the contract covers a program set forth in Appendix B of the Regulations.
- c. **Solicitations for Subcontracts, including Procurements of Materials and Equipment:** In all solicitations either by competitive bidding or negotiation made by the contractor for work to be performed under a subcontract, including procurements of materials or leases of equipment, each potential subcontractor or supplier shall be notified by the contractor of the contractor's obligations under this contract and the Regulations relative to nondiscrimination on the grounds of race, color, or national origin.
- d. **Information and Reports:** The contractor shall provide all information and reports required by the Regulations, or directives issued pursuant thereto, and shall permit access to its books, records, accounts, other sources of information, and its facilities as may be determined by the Department of Transportation or the Federal Highway Administration to be pertinent to ascertain compliance with such Regulations or directives. Where any information required of a contractor is in the exclusive possession of another who fails or refuses to furnish this information, the contractor shall so certify to the Department of Transportation, or the Federal Highway Administration as appropriate, and shall set forth what efforts it has made to obtain the information.
- e. **Sanctions for Noncompliance:** In the event of the contractor's noncompliance with the nondiscrimination provisions of this contract, the Department of Transportation shall impose such contract sanctions as it or the Federal Highway Administration may determine to be appropriate, including, but not limited to,

- (1) withholding of payments to the contractor under the contract until the contractor complies, and/or
- (2) cancellation, termination or suspension of the contract, in whole or in part.

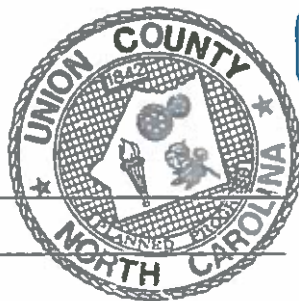
- f. **Incorporation of Provisions:** The contractor shall include the provisions of paragraphs "a" through "f" in every subcontract, including procurements of materials and leases of equipment, unless exempt by the Regulations, or directives issued pursuant thereto. The contractor shall take such action with respect to any subcontract or procurement as the Department of Transportation or the Federal Highway Administration may direct as a means of enforcing such provisions including sanctions for noncompliance: Provided, however, that, in the event a contractor becomes involved in, or is threatened with, litigation with a subcontractor or supplier as a result of such direction, the contractor may request the Department of Transportation to enter into such litigation to protect the interests of the State, and, in addition, the contractor may request the United States to enter into such litigation to protect the interests of the United States.

R/W (161) : Party of the Second Part certifies that this agreement is true and accurate copy of the form R/W (161) incorporating all revisions to date.

IN WITNESS WHEREOF, each of the parties to this agreement has caused the same to be executed the day and year first above written.

ATTEST OR WITNESS:

*Ryan D. West*



DocuSigned by: *Larry Sanders* DEPARTMENT OF TRANSPORTATION  
State Encroachments Engineer  
C1AAA5BAED54457... ENGINEER XXX

*Michelle Lancaster*  
*Michelle Lancaster*  
Acting County Manager  
Second Party

**INSTRUCTIONS**

When the applicant is a corporation or a municipality, this agreement must have the corporate seal and be attested by the corporation secretary or by the empowered city official, unless a waiver of corporate seal and attestation by the secretary or by the empowered City official is on file in the Raleigh office of the Manager of Right of Way. In the space provided in this agreement for execution, the name of the corporation or municipality shall be typed above the name, and title of all persons signing the agreement should be typed directly below their signature.

When the applicant is not a corporation, then his signature must be witnessed by one person. The address should be included in this agreement and the names of all persons signing the agreement should be typed directly below their signature.

This agreement must be accompanied, in the form of an attachment, by plans or drawings showing the following applicable information:

12. Length, size and type of encasement where required.
13. On underground crossings, notation as to method of crossing - boring and jacking, open cut, etc.
14. Location of vents.

#### GENERAL REQUIREMENTS

1. Any attachment to a bridge or other drainage structure must be approved by the Head of Structure Design in Raleigh prior to submission of encroachment agreement to the Division Engineer.
2. All crossings should be as near as possible normal to the centerline of the highway.
3. Minimum vertical clearances of overhead wires and cables above all roadways must conform to clearances set out in the National Electric Safety Code.
4. Encasements shall extend from ditch line to ditch line in cut sections and 5' beyond toe of slopes in fill sections.
5. All vents should be extended to the right of way line or as otherwise required by the Department.
6. All pipe encasements as to material and strength shall meet the standards and specifications of the Department.
7. Any special provisions or specifications as to the performance of the work or the method of construction that may be required by the Department must be shown on a separate sheet attached to encroachment agreement provided that such information cannot be shown on plans or drawings.
8. The Department's Division Engineer should be given notice by the applicant prior to actual starting of installation included in this agreement.



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION

ROY COOPER  
GOVERNOR

J. ERIC BOYETTE  
SECRETARY

September 14, 2020

COUNTY: Union

SUBJECT: Revision to Encroachment Contract #E103-090-18-00120 – Union County Public Works

Michael Lancaster  
Acting County Manager  
Union County Public Works  
500 North Main Street  
Monroe, NC 28112

Dear Mr. Lancaster:

Attached for your files is a copy of the above-referenced Right of Way Encroachment Contract, properly executed. **This contract covers the following revisions:**

- 1) Plan Sheet C5 STA. 54+53 Goldmine Rd (SR 1162) -Bore & Jack across Goldmine Rd (SR 1162) occurs earlier in the alignment thus shifting the alignment closer to N Rocky River Rd (SR 1007).
- 2) Plan Sheet C5 STA. 54+55 - 57+29 Goldmine Rd (SR 1162) -Bore & Jack across Goldmine Rd (SR 1162) increases to approx. 274 ft in length and occurs at different depths.
- 3) Plan Sheet C11 STA. 113+08 N Rocky River Rd (SR 1007) -Sewer Crossing Pipe Encasement has been removed.
- 4) Plan Sheet C11 STA. 114+34 - 115+05 N Rocky River Rd (SR 1007)- Bore pit sizes have been modified (outside of NCDOT R/W).
- 5) Plan Sheet C12 STA. 127+56 NC Hwy 49 (SR 1009)- Bore & Jack casing lengthened from 74 LF to 80 LF; depth of alignment at this is approximately 1 foot deeper.
- 6) Plan Sheet C17 STA.169+77 - 171+25 US74- Bore & Jack under US74 is approximately. 5 ft deeper in new plans. Boring pits have changed dimensions.
- 7) Plan Sheet C18 STA. 178+39 - 179+75 James Hamilton Rd (SR 1511)- Bore & Jack under James Hamilton Rd has lengthened from 70 LF to 136 LF and shifted in horizontal alignment & vertical alignment. Boring pits have changed dimensions.
- 8) Plan Sheet C23 STA. 229+26 - 230+39 N Rocky River Rd (SR 1514)- Bore & Jack under N Rocky River Rd has a different vertical profile. Boring pits have changed dimensions.
- 9) Plan Sheet C24 STA.247+61 - 248+26 Myers Rd (SR 1512)- Bore & Jack under Myers R (SR 1512) has a different vertical profile. Boring pits have changed dimensions.
- 10) Plan Sheet C28 STA. 284+71 Secrest Short Cut Rd (SR 1501)- 16" DIP Transmission Main now ends adjacent to Haywood Rd (SR 1513).

*Mailing Address:*  
NC DEPARTMENT OF TRANSPORTATION  
UTILITIES UNIT  
1555 MAIL SERVICE CENTER  
RALEIGH NC 27699-1555

TELEPHONE: 919-707-6690  
FAX: 919-250-4151  
CUSTOMER SERVICE: 1-877-368-4968

WEBSITE: NCDOT.GOV

*Location:*  
CENTURY CENTER COMPLEX  
ENTRANCE A-1  
1000 BIRCH RIDGE DRIVE  
RALEIGH NC 27610


Mr. Michael Lancaster  
September 14, 2020  
Page 2

11) Plan Sheet C28 STA.284+51 Secrest Short Cut Rd (SR 1501) – Additional Bore & Jack crossing of Secrest Short Cut Rd. Additional 8" RJDIP Waterline and related fittings/accessories to be installed.

All previously approved Special Provisions remain in effect.

Sincerely,

Byron Sanders Jr., PE  
State Utilities Manager

DocuSigned by:  
  
C1AAA5BAED54467...

Larry D. Sanders, MGIST, PE, CPM  
State Encroachments Engineer

LDS/dhp  
Attachment



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION

ROY COOPER  
GOVERNOR

J. ERIC BOYETTE  
SECRETARY

January 21, 2021

COUNTY: Union

SUBJECT: Revision to Encroachment Contract #E103-090-18-00120 – Union County Public Works

Michael Lancaster  
Acting County Manager  
Union County Public Works  
500 North Main Street  
Monroe, NC 28112

Dear Mr. Lancaster:


Attached for your files is a copy of the above-referenced Right of Way Encroachment Contract, properly executed. **This contract covers the following revision:**

- 1) Plan Sheet C23, Approximate STA. 229+40, SR 1514 (North Rocky River Road) Bore & Jack across SR 1514. Erosion Control Permitting required an undisturbed 15-foot buffer adjacent to a delineated stream which forced shifting the bore and jack. The bore and jack casing length increased by 6 LF resulting in a total length of 80LF. Also, the original crossing was approximately 3 degrees from perpendicular (approx. 87 degrees) and this revised crossing is approximately 24 degrees from perpendicular (approx. 66 degrees).

All previously approved Special Provisions remain in effect.

Sincerely,

Byron Sanders Jr., PE, CPM  
State Utilities Manager

DocuSigned by:  
  
C1AAA5BAED54467

Larry D. Sanders, MGIST, PE, CPM  
State Encroachments Engineer

LDS/dhp  
Attachment

*Mailing Address:*  
NC DEPARTMENT OF TRANSPORTATION  
UTILITIES UNIT  
1555 MAIL SERVICE CENTER  
RALEIGH NC 27699-1555

*TELEPHONE:* 919-707-6690  
*FAX:* 919-250-4151  
*CUSTOMER SERVICE:* 1-877-368-4968

*WEBSITE:* NCDOT.GOV

*Location:*  
CENTURY CENTER COMPLEX  
ENTRANCE A-I  
1000 BIRCH RIDGE DRIVE  
RALEIGH NC 27610









## **APPENDIX C – NCDEQ 401 Water Quality Certification**



ROY COOPER  
*Governor*  
 MICHAEL S. REGAN  
*Secretary*  
 S. DANIEL SMITH  
*Director*



December 3, 2020

DWR# 20-1051  
 Union County

Mr. John Shutak, P.E.  
 500 North Main St.  
 Monroe, NC 28112

**Subject:** APPROVAL of 401 Water Quality Certification with Additional Conditions  
 853W Zone Improvement Project

Dear Mr. Shutak:

You have our approval, in accordance with the General Certification and those conditions listed below, for the purpose proposed in your application submitted on August 14, 2020, and fee received by the Division of Water Resources (the Division) on August 19, 2020, and subsequent information on November 20, 2020. These impacts are covered by the attached Water Quality General Certification Number 4133. This certification is associated with the use of Nationwide Permit Number 12 once it is issued to you by the U.S. Army Corps of Engineers (COE). Please note that you should get any other federal, state or local permits before proceeding with your project, including those required by (but not limited to) Sediment and Erosion Control, Non-Discharge, and Water Supply Watershed regulations.

The above noted Certification will expire when the associated 404 permit expires unless otherwise specified in the General Certification. The Division has determined that the proposed project will comply with the water quality requirements provide that you adhere to the conditions listed in the certification and the additional condition listed below.

This approval is for the purpose and design described in your application. The plans and specifications for this project are incorporated by reference as part of this Certification. If you change your project, you must notify the Division and you may be required to submit a new application package with the appropriate fee. If the property is sold, the new owner must be given a copy of this Certification and is responsible for complying with all conditions. [15A NCAC 02H .0507(d)(2)].

1. The Mooresville Regional Office shall be notified in writing once construction at the approved impact areas has commenced. 15A NCAC 02H .0502 (e)
2. Approved Impacts, no other impacts including incidental impacts are approved:

Type of Impact	Amount Approved Temporary Impact	Amount Approved Permanent Impact
Stream	411 linear ft. (stabilization)	331 linear ft. (riprap)
Wetland	0.062 acre	0.016 acre (conversion)

3. Diversion Ditches and other storm water conveyances as related to the sediment and erosion control measures shall be matted and/or stabilized to reduce sediment loss and turbidity. This includes



interior/exterior slopes of sediment basins. 15A NCAC 02H .0506 (b)(3) and (c)(3)

4. The construction of the new sewer line may result in additional development along the construction corridor. Development of these parcels may impact additional waters and cause violations of downstream water quality standards. **The cumulative impacts** for this project must be adequately addressed by the applicant (**Union County**) or the applicant may assume responsibility for post construction storm water management plan (SMP) for any development associated with this sewer system. The SMP shall be approved prior to the initiation of land disturbance. Prior to the occupation of any structure and/or facility, the approved SMP shall be constructed and operational. The storm water facilities at minimum must be designed to meet state or document that the project will not impact water quality. 15A NCAC 2H .1000, 15A NCAC 02H .0506(b)(5)
5. During the construction of the project, no staging of equipment of any kind is permitted in waters of the U.S., or protected riparian buffers. 15A NCAC 02H .0506(b)(3)
6. The permittee shall report to the Mooresville Regional Office any noncompliance with this certification, any violation of stream or wetland standards [including but not limited to sediment impacts, and any violation of state regulated riparian buffer rules. Information shall be provided orally within 24 hours (or the next business day if a weekend or holiday) from the time the applicant became aware of the circumstances. A written submission shall also be provided within 5 business days of the time the applicant becomes aware of the circumstances. The written submission shall contain a description of the noncompliance, and its causes; the period of noncompliance, including exact dates and times, if the noncompliance has not been corrected, the anticipated time compliance is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance. The Division may waive the written submission requirement on a case-by-case basis. 15A NCAC 02B .0200
7. The Permittee shall ensure that the final design drawings adhere to the permit and to the permit drawings submitted for approval. 15A NCAC 02H .0507 (c) and 15A NCAC 02H .0506 (b)(2) and (c)(2)
8. Upon completion of the project, the applicant shall complete and return a "Certificate of Completion" form to the 401/Wetlands Branch of the Division using the following link:  
<https://edocs.deq.nc.gov/Forms/Certificate-of-Completion>. 15A NCAC 02H .0507(c)

This approval and its conditions are final and binding unless contested. [G.S. 143-215.5] Please be aware that by having impacted waters without first applying for and securing the issuance of a 401 Water Quality Certification, you have violated Title 15A of the North Carolina Administrative Code (NCAC) 2H .0500. Title 15A NCAC 2H .0500 requires certifications pursuant to Section 401 of the Clean Water Act whenever construction or operation of facilities will result in a discharge into navigable waters, including wetlands, as described in 33 Code of Federal Regulations (CFR) Part 323. It also states any person desiring issuance of the State certification or coverage under a general certification required by Section 401 of the Federal Water Pollution Control Act shall file with the Director of the North Carolina Division of Water Quality. Pursuant to G.S. 143-215.6A, these violations and any future violations are subject to a civil penalty assessment of up to a maximum of \$25,000.00 per day for each violation.

This Certification can be contested as provided in Chapter 150B of the North Carolina General Statutes by filing a Petition for a Contested Case Hearing (Petition) with the North Carolina Office of Administrative Hearings (OAH) **within sixty (60) calendar days**. Requirements for filing a Petition are set forth in Chapter 150B of the North Carolina General Statutes and Title 26 of the North Carolina Administrative Code. Additional information regarding requirements for filing a Petition and Petition forms may be accessed at <http://www.ncoah.com/> or by calling the OAH Clerk's Office at (919) 431-3000.

One (1) copy of the Petition must also be served to the North Carolina Department of Environmental Quality:

William F. Lane, General Counsel  
Department of Environmental Quality  
1601 Mail Service Center  
Raleigh, NC 27699-1601

This letter completes the review of the Division under section 401 of the Clean Water Act and 15A NCAC 02H .0500. Please contact Mr. Alan Johnson in the Mooresville Regional Office at 704-663-1699.

Sincerely,

DocuSigned by:  
*Andrew H Pitner* for  
F161FB69A2D84A3...

W. Corey Basinger, Regional Supervisor  
Water Quality Regional Operations Section  
Mooresville Regional Office, DEQ

Attachment

cc: Bryan Rhoden Reynolds, Army Corps of Engineers, Charlotte, email  
Phil May, CEI, [Phil.may@carolinaeco.com](mailto:Phil.may@carolinaeco.com)  
DWR 401 & Buffer Permitting Branch file  
MRO, Land Quality

**CERTIFICATE OF COMPLETION**

NCDWR Project No.: \_\_\_\_\_

County: \_\_\_\_\_

Applicant: \_\_\_\_\_

Project Name: \_\_\_\_\_

Date of Issuance of 401 Water Quality Certification: \_\_\_\_\_

**Certificate of Completion**

Upon completion of all work approved within the 401 Water Quality Certification or applicable Buffer Rules, and any subsequent modifications, the applicant is required to return this certificate to the 401 Wetland & Buffer Permitting Unit, North Carolina Division of Water Resources, 1617 Mail Service Center, Raleigh, NC, 27699-1617. This form may be returned to NCDWR by the applicant, the applicant's authorized agent, or the project engineer. It is not necessary to send certificates from all of these.

***Applicant's Certification***

I, \_\_\_\_\_, hereby state that, to the best of my abilities, due care and diligence was used in the observation of the construction such that the construction was observed to be built within substantial compliance and intent of the 401 Water Quality Certification and Buffer Rules, the approved plans and specifications, and other supporting materials.

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

***Agent's Certification***

I, \_\_\_\_\_, hereby state that, to the best of my abilities, due care and diligence was used in the observation of the construction such that the construction was observed to be built within substantial compliance and intent of the 401 Water Quality Certification and Buffer Rules, the approved plans and specifications, and other supporting materials.

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

***Engineer's Certification***

\_\_\_\_\_ Partial      \_\_\_\_\_ Final

I, \_\_\_\_\_, as a duly registered Professional Engineer in the State of North Carolina, having been authorized to observe (periodically, weekly, full time) the construction of the project for the Permittee hereby state that, to the best of my abilities, due care and diligence was used in the observation of the construction such that the construction was observed to be built within substantial compliance and intent of the 401 Water Quality Certification and Buffer Rules, the approved plans and specifications, and other supporting materials.

Signature \_\_\_\_\_ Registration No. \_\_\_\_\_ Date \_\_\_\_\_



## **APPENDIX D – USACE Section 404 Permit**



**U.S. ARMY CORPS OF ENGINEERS  
WILMINGTON DISTRICT**

Action Id. SAW-2020-01443 County: Union U.S.G.S. Quad: NC-Bakers

**GENERAL PERMIT (REGIONAL AND NATIONWIDE) VERIFICATION**

Permittee: Union County Public Works  
John Shutak  
Address: 500 North Main Street  
Monroe, NC 28112  
Telephone Number: 704-283-3651  
E-mail: john.shutak@unioncountync.gov

Size (acres)	<u>22.2</u>	Nearest Town	<u>Monroe</u>
Nearest Waterway	<u>Stewarts Creek</u>	River Basin	<u>Upper Pee Dee</u>
USGS HUC	<u>03040105</u>	Coordinates	Latitude: <u>35.038597</u> Longitude: <u>-80.600228</u>

Location description: The review begins at the intersection of Haywood Road and Secrest Short Cut Road then runs along Secrest Short Cut Road and N. Rocky River Road. The review area ends near the intersection of N. Rocky River Road and Price Short Cut Road. Reference review area description shown in Pre-Construction Notification entitled "Figure 1, Vicinity Map" and Dated August 2020.

Description of projects area and activity: This verification authorizes the permanent stream impacts of 338 linear feet and 0.074 acres of wetland along with the temporary stream and wetland impacts of 411 linear feet and 0.187 acres, respectively to improve hydraulics from the Watkins Pump Station into Union County's existing distribution system. All temporary stream and wetlands impacts will be restored to pre-existing conditions after the completion of construction. Permanent stream impacts are associated with bank stabilization activities and do not result in the loss of waters.

Applicable Law(s):  Section 404 (Clean Water Act, 33 USC 1344)  
 Section 10 (Rivers and Harbors Act, 33 USC 403)

Authorization: **NWP 12. Utility Line Activities and NWP. 13 Bank Stabilization Activities**

**SEE ATTACHED NWP GENERAL, REGIONAL, AND/OR SPECIAL CONDITIONS**

Your work is authorized by the above referenced permit provided it is accomplished in strict accordance with the enclosed Conditions, your application signed and dated 8/17/2020, and the enclosed plans Final Design Plans dated July 2020. Any violation of the attached conditions or deviation from your submitted plans may subject the permittee to a stop work order, a restoration order, a Class I administrative penalty, and/or appropriate legal action.

This verification will remain valid until the expiration date identified below unless the nationwide authorization is modified, suspended or revoked. If, prior to the expiration date identified below, the nationwide permit authorization is reissued and/or modified, this verification will remain valid until the expiration date identified below, provided it complies with all requirements of the modified nationwide permit. If the nationwide permit authorization expires or is suspended, revoked, or is modified, such that the activity would no longer comply with the terms and conditions of the nationwide permit, activities which have commenced (i.e., are under construction) or are under contract to commence in reliance upon the nationwide permit, will remain authorized provided the activity is completed within twelve months of the date of the nationwide permit's expiration, modification or revocation, unless discretionary authority has been exercised on a case-by-case basis to modify, suspend or revoke the authorization.

Activities subject to Section 404 (as indicated above) may also require an individual Section 401 Water Quality Certification. You should contact the NC Division of Water Resources (telephone 919-807-6300) to determine Section 401 requirements.

For activities occurring within the twenty coastal counties subject to regulation under the Coastal Area Management Act (CAMA), prior to beginning work you must contact the N.C. Division of Coastal Management Morehead City, NC, at (252) 808-2808.

This Department of the Army verification does not relieve the permittee of the responsibility to obtain any other required Federal, State or local approvals/permits.

If there are any questions regarding this verification, any of the conditions of the Permit, or the Corps of Engineers regulatory program, please contact **Bryan Roden-Reynolds at 704-510-1440 or [bryan.roden-reynolds@usace.army.mil](mailto:bryan.roden-reynolds@usace.army.mil)**.

RODEN  
Corps Regulatory Official: REYNOLDS.BRYAN.KENNETH.1263385574  
Expiration Date of Verification: **03/18/2022**

Digitally signed by RODEN  
REYNOLDS.BRYAN.KENNETH.1263385574  
Date: 2020.12.09 14:49:51 -05'00'

Date: **12/9/2020**

The Wilmington District is committed to providing the highest level of support to the public. To help us ensure we continue to do so, please complete the Customer Satisfaction Survey located at [http://corpsmapu.usace.army.mil/cm\\_apex/f?p=136:4:0](http://corpsmapu.usace.army.mil/cm_apex/f?p=136:4:0)

Copy furnished:

Agent: **Carolina Ecosystems, Inc.**  
**Phil May**  
Address: **P.O. Box 41**  
**Lewisville, NC 27023**  
Telephone Number: **919-606-1065**  
E-mail: **[phil.may@carolinaeco.com](mailto:phil.may@carolinaeco.com)**

**Action ID Number: SAW-2020-01443 County: Union**

**Permittee: Union County Public Works, John Shutak**

**Project Name: 853W Zone Improvements**

**Date Verification Issued: 12/9/2020**

**Project Manager: Bryan Roden-Reynolds**

**Upon completion of the activity authorized by this permit and any mitigation required by the permit, sign this certification and return it to the following address:**

**US ARMY CORPS OF ENGINEERS  
WILMINGTON DISTRICT  
Attn: Bryan Roden-Reynolds  
Charlotte Regulatory Office  
U.S Army Corps of Engineers  
8430 University Executive Park Drive, Suite 615  
Charlotte, North Carolina 28262  
or  
bryan.roden-reynolds@usace.army.mil**

**Please note that your permitted activity is subject to a compliance inspection by a U. S. Army Corps of Engineers representative. Failure to comply with any terms or conditions of this authorization may result in the Corps suspending, modifying or revoking the authorization and/or issuing a Class I administrative penalty, or initiating other appropriate legal action.**

**I hereby certify that the work authorized by the above referenced permit has been completed in accordance with the terms and condition of the said permit, and required mitigation was completed in accordance with the permit conditions.**

\_\_\_\_\_  
**Signature of Permittee**

\_\_\_\_\_  
**Date**

**MEMORANDUM FOR RECORD**

**SUBJECT: Department of the Army Memorandum Documenting General Permit Verification**

- 1.0 **Introduction and overview:** Information about the proposal subject to one or more of the Corps regulatory authorities is provided in Section 1, detailed evaluation of the activity is found in Sections 2 through 4 and findings are documented in Section 5 of this memorandum. Further, summary information about the activity including administrative history of actions taken during project evaluation is attached (ORM2 summary).
- 1.1 Applicant name: **Union County Public Works, John Shutak**
- 1.2 Activity location: Latitude: **35.038597** Longitude: **-80.600228** Location description: **The review begins at the intersection of Haywood Road and Secrest Short Cut Road then runs along Secrest Short Cut Road and N. Rocky River Road. The review area ends near the intersection of N. Rocky River Road and Price Short Cut Road. Reference review area description shown in Pre-Construction Notification entitled "Figure 1, Vicinity Map" and Dated August 2020.**
- 1.3 Description of activity requiring verification: **This verification would authorize the permanent stream impacts of 338 linear feet and 0.074 acres of wetland along with the temporary stream and wetland impacts of 411 linear feet and 0.187 acres, respectively to improve hydraulics from the Watkins Pump Station into Union County's existing distribution system. All temporary stream and wetlands impacts will be restored to pre-existing conditions after the completion of construction. Permanent stream impacts are associated with bank stabilization activities and do not result in the loss of waters.**
- 1.4 Is this an After-the-Fact verification? **No.**
- 1.5 Date PCN determined complete for processing **9/10/2020**
- 1.6 Jurisdiction Determination completed? **No JD has been completed.**
- 1.7 Permit authority: **Section 404 of the Clean Water Act (33 USC 1344)**
- 1.8 Applicable Permit: **NWP 12. Utility Line Activities and NWP. 13 Bank Stabilization Activities**
- 1.9 Activity requires written waiver of NWP limits? **No.**
- 1.10 Activity requires a waiver from the requirements of a regional condition(s)? **No.**

**2.0 Evaluation of the Pre-Construction Notification**

**2.1 Direct and indirect effects caused by the GP activity: The direct effects of the proposed activity in waters would include the loss of jurisdictional waters (as specified in Section 1.3) and their associated aquatic resource functions. The proposed activity also has the potential to result in indirect effects to waters including excess sedimentation in downstream waters, disruption and/or killing of aquatic life in the direct vicinity of the project area, increase of downstream flows, and blocking/restricting aquatic life passage transiting in and through the project area. These indirect effects are expected to be minimal due to design criteria and Best Management Practices (BMPs) required by Nationwide Permit General and Regional Conditions. Additionally, indirect effects would be further reduced through the implementation of BMPs required by state, local, and Federal ordinances and regulations.**

**2.2 Site specific factors: The review area consists primarily of maintained roadsides along farm fields, subdivision and some forested areas. The land use in the vicinity of the review area is primarily subdivision development with farm fields and some commercial areas.**

**2.3 Coordination**

**2.3.1 Was the PCN coordinated with other agencies? No.**

**Agency coordination is not required and was not conducted for the proposed project.**

**2.3.2 Was the PCN coordinated with other Corps offices? No.**

**2.4 Mitigation**

**2.4.1 Provide brief description of how the activity has been designed on-site to avoid and minimize adverse effects, both temporary and permanent, to waters of the United States to the maximum extent practicable at the project site: The applicant provided a detailed statement describing their efforts to avoid and minimized impacts to waters of the United States on the project site in the preconstruction notification. Based on this information, the Corps believes the applicant has avoid and minimized impacts to waters of the United State to the maximum extent practicable.**

**2.4.2 Is compensatory mitigation required for unavoidable impacts to jurisdictional aquatic resources to reduce the individual and cumulative adverse environmental effects to a minimal level?  
No.**

Provide rationale: **No compensatory mitigation is required because the applicant has minimized impacts and the loss of wetlands associated with the activity is less than 0.10 acre. There are no specific circumstances that would warrant compensatory mitigation. No compensatory mitigation is required because the activity consists of the construction of a structure that would not adversely impact aquatic resources.**

### **3.0 Compliance with Other Laws, Policies and Requirements**

#### **3.1 Section 7(a)(2) of the Endangered Species Act (ESA)**

**3.1.1 ESA action area: The action area includes the waters of the United States that will be directly affected by the proposed work or structures and uplands directly affected as a result of authorizing the work or structures.**

**3.1.2 Has another federal agency taken steps to document compliance with Section 7 of the ESA and completed consultation(s) as required? No.**

**3.1.3 Known species/critical habitat present? No. The Corps has determined that it has fulfilled its responsibilities under Section 7(a)(2) of the ESA.**

**IPAC Species in Union County:**

**NAME: Carolina Heelsplitter (*Lasmigona decorata*) STATUS: Endangered**

**NAME: Michaux's sumac (*Rhus michauxii*) STATUS: Endangered**

**NAME: Schweinitz's sunflower (*Helianthus schweinitzii*) STATUS: Endangered**

Effect determination(s), including no effect, for all known species/habitat, and basis for determination(s): **Based on the latest version of the Natural Heritage Program's NHEO data, there are listed species located within or in the vicinity of the action area and this activity is one that may affect those listed species. The Corps has determined that the activity may affect, but is not likely to adversely affect species subject to the ESA. In addition, in a email dated December 9, 2020, the USFWS stated "Due to the presence of suitable habitat, but lack of onsite evidence for these species, we believe the probability for project-mediated loss of these plants is insignificant and discountable. Therefore, we would concur with an action agency determination that the project may affect, but is not likely to adversely affect these species within the areas evaluated."**

**3.1.4 Consultation with either the National Marine Fisheries Service and/or the U.S. Fish and Wildlife Service was initiated and completed as required, for any determinations other than "no effect" (see the attached "Summary" sheet for begin date, end date and closure method of the consultation). Based on a review of the information above, the Corps has determined that it has fulfilled its responsibilities under Section 7(a)(2) of the ESA.**



**3.2 Magnuson-Stevens Fishery Conservation and Management Act, Essential Fish Habitat (EFH) The NWPs/RGPs were coordinated with the NMFS during the permit renewal process. NMFS coordination/EFH consultation is required if the activity affects SAV. This activity does not affect SAV. Therefore, NMFS coordination/EFH consultation has been completed.**

**3.2.1 Has another federal agency taken steps to comply with EFH provisions of Magnuson-Stevens Act? No.**

**3.2.2 Did the proposed project require review under the Magnuson-Stevens Act? No.**

**3.3 Section 106 of the National Historic Preservation Act (Section 106)**

**3.3.1 Section 106 permit area: The permit area includes those areas comprising waters of the United States that will be directly affected by the proposed work or structures, as well as activities outside of waters of the U.S. because all three tests identified in 33 CFR 325, Appendix C(g)(1) have been met.**

**Final description of the permit area: All three test have been met and portions of the larger project undertaken outside of waters of the U.S. are in the permit area. Activities undertaken outside WOUS are included in the permit area because those activities are directly associated and integrally related with the authorized work and those activities would not occur but for the authorization of the work within the WOUS.**

**3.3.2 Has another federal agency taken steps to comply with Section 106 of the National Historic Preservation Act and completed consultation(s) as required? No.**

**3.3.3 Known cultural resource sites present and/or survey or other additional information needed? No. Based on the NCDCCR "HPOWEB" service and aerial photographs, there are no known historic properties located in the permit area or in close proximity to the permit area.**

**Effect determination and basis for that determination: The Corps has determined the proposed activity will have no effect on properties listed or eligible for listing in the National Register of Historic Places.**

**3.3.4 Consultation was initiated and completed as required with the appropriate agencies, tribes and/or other parties for any determinations other than "no potential to cause effects" (see the attached "Summary" sheet for consultation type, begin date, end date and closure method of the consultation). The Corps has determined that it has fulfilled its responsibilities under Section 106 of the NHPA.**

**3.4 Tribal Trust Responsibilities**

- 3.4.1 Was government-to-government consultation conducted with Federally-recognized Tribe(s)? **No. There are no known tribal interests in the project area.**

Provide a description of any consultation(s) conducted including results and how concerns about significant effects to protected tribal resources, tribal rights and/or Indian lands were addressed. The Corps has determined that it has fulfilled its tribal trust responsibilities.

- 3.4.2 Other Tribal including any discussion of Tribal Treaty rights? **Select Yes or No.**

**3.5 Section 401 of the Clean Water Act – Water Quality Certification (WQC)**

- 3.5.1 Is a Section 401 WQC required, and if so, has the certification been issued or waived? **A general WQC has been issued for this permit.**

**3.6 Coastal Zone Management Act (CZMA)**

- 3.6.1 Is a CZMA consistency concurrence required, and if so, has the concurrence been issued, waived or presumed? **N/A, a CZMA consistency concurrence is not required.**

**3.7 Wild and Scenic Rivers Act**

- 3.7.1 Is the project located in a component of the National Wild and Scenic River System, or in a river officially designated by Congress as a “study river” for possible inclusion in the system? **No. According to <http://www.rivers.gov>, the proposed project area is not within a designated or study river.**

**3.8 Effects on Corps Civil Works Projects (33 USC 408)**

- 3.8.1 Does the applicant also require permission under Section 14 of the Rivers and Harbors Act (33 USC 408) because the activity, in whole or in part, would alter, occupy, or use a Corps Civil Works project? **No, there are no Corps Civil Works project(s) in or near the vicinity of the proposal.**

**4.0 Special Conditions**

- 4.1 Are special conditions required to ensure minimal effects, protect the public interest and/or ensure compliance of the activity with any of the laws above? **No.**

If no, provide rationale: **The terms and conditions of the general permit are sufficient to ensure no more than minimal adverse effects, and no**

**conditions are needed for compliance with other laws or to protect the public interest.**

**5.0 Determination**

5.1 Waiver request conclusion, if required or select N/A: N/A.

5.2 The **activity** will result in no more than minimal individual and cumulative adverse effects on the aquatic environment and will not be contrary to the public interest.

5.3 This activity, as described, complies with all terms and conditions of the permits identified in Section 1.5.

**PREPARED BY:**

RODEN

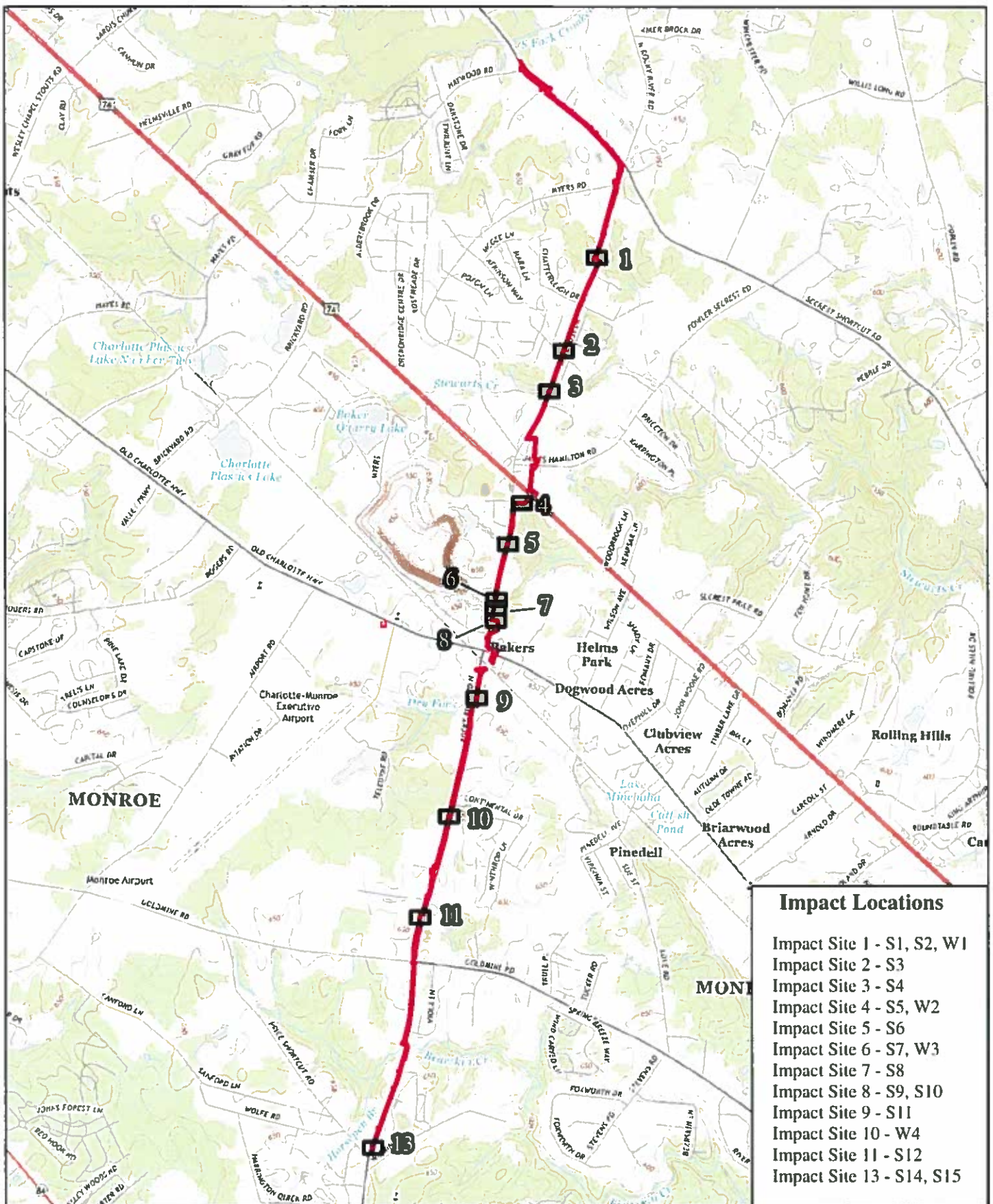
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Bryan Roden-Reynolds

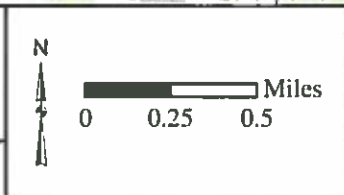
Digitally signed by RODEN  
REYNOLDS.BRYAN.KENNETH.126  
3385574

Date: 2020.12.09 14:49:30 -05'00' Date: 12/9/2020



**CAROLINA ECOSYSTEMS**

November 2020



**Project Limits of Disturbance**

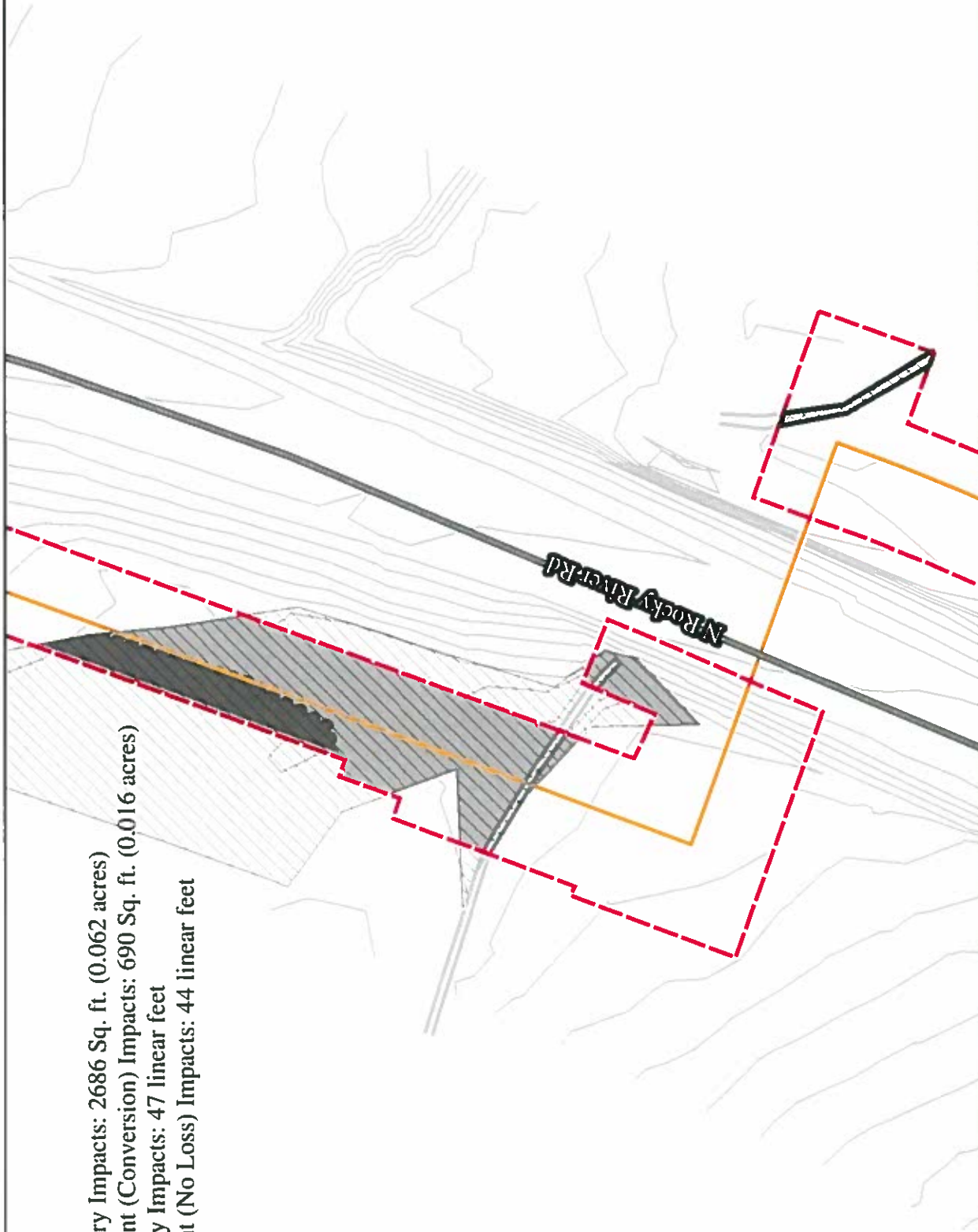
**Impact Site**

Bakers (2013), Matthews (2013), Monroe (2013), and Waxhaw (2013) US Geological Survey 1:24000 Quadrangle Map

**853W Zone Improvements Union County, NC**

**Figure 5.0: Impact Site Index Map**

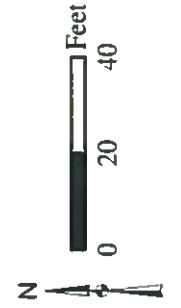
W1: Temporary Impacts: 2686 Sq. ft. (0.062 acres)  
 W1: Permanent (Conversion) Impacts: 690 Sq. ft. (0.016 acres)  
 S1: Temporary Impacts: 47 linear feet  
 S2: Permanent (No Loss) Impacts: 44 linear feet



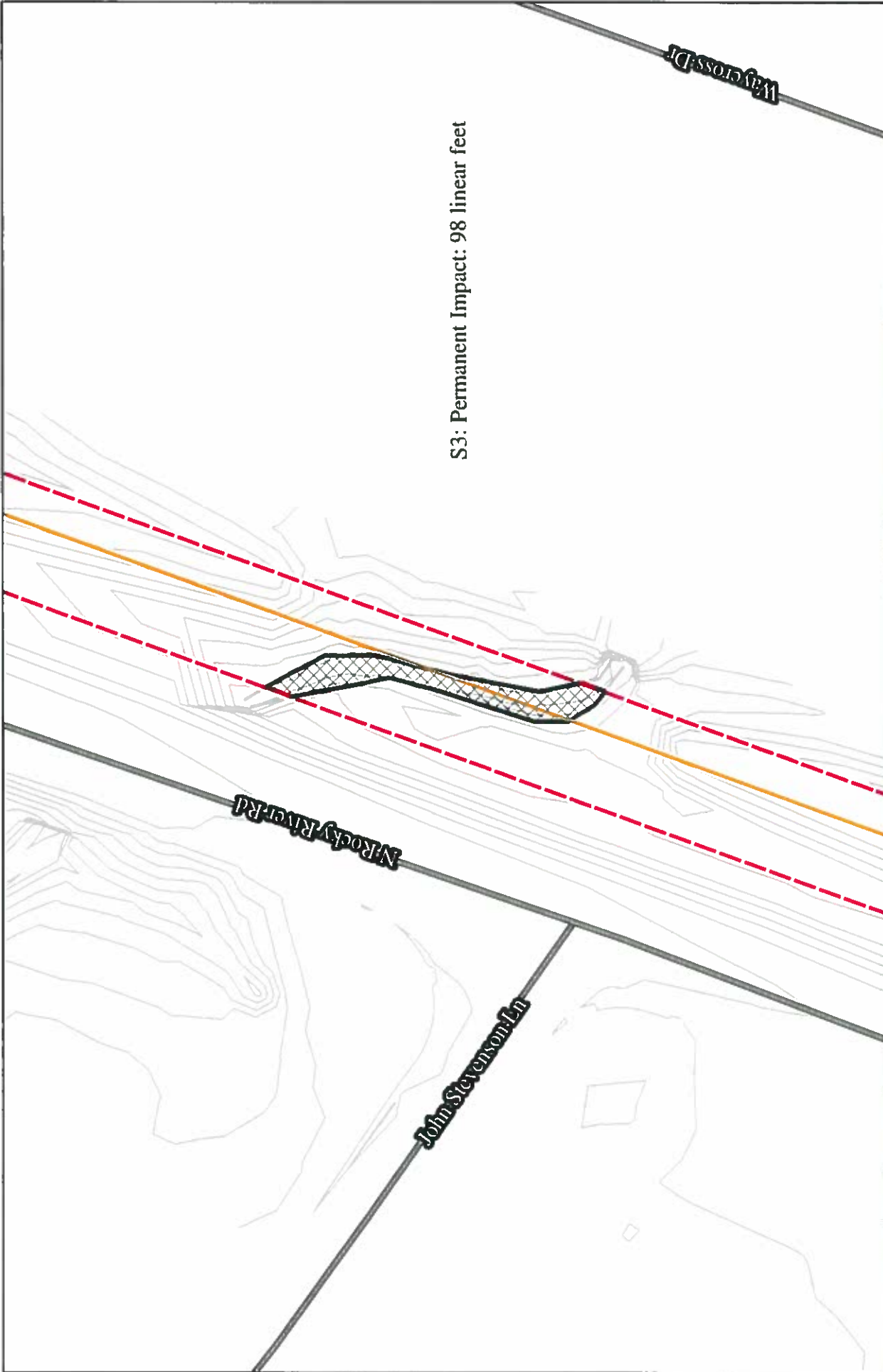
Map Date: November 2020  
 Revised:  
 Revised:  
 Revised:

853W Zone Improvements  
 Union County, NC  
 Figure 5.1:  
 Impact Site 1

Construction Limits  
 Proposed Waterline Alignment  
 Permanents (No Loss) Stream Impact  
 Temporary Stream Impact  
 Stream Channels  
 Wetlands  
 Permanent (Conversion) Wetland Impacts  
 Temporary Wetland Impacts  
 E Contours







S3: Permanent Impact: 98 linear feet

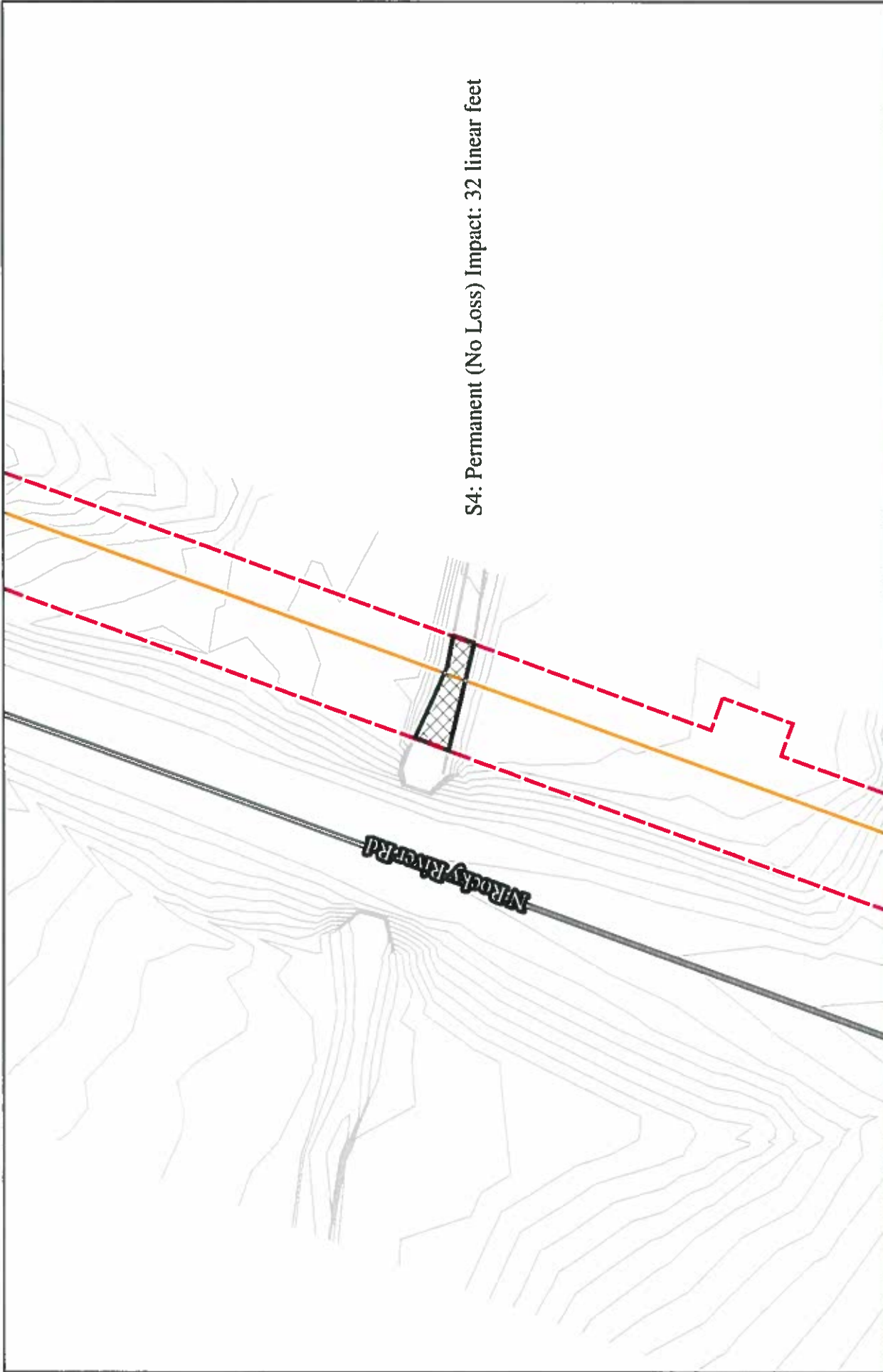
853W Zone Improvements  
 Union County, NC

Map Date: November 2020  
 Revised:  
 Revised:  
 Revised:

- Construction Limits
- Proposed Waterline Alignment
- Permanent (No Loss) Stream Impact
- Temporary Stream Impact
- Stream Channels
- Wetlands
  - Permanent (Conversion) Wetland Impacts
  - Temporary Wetland Impacts
  - 1' Contours



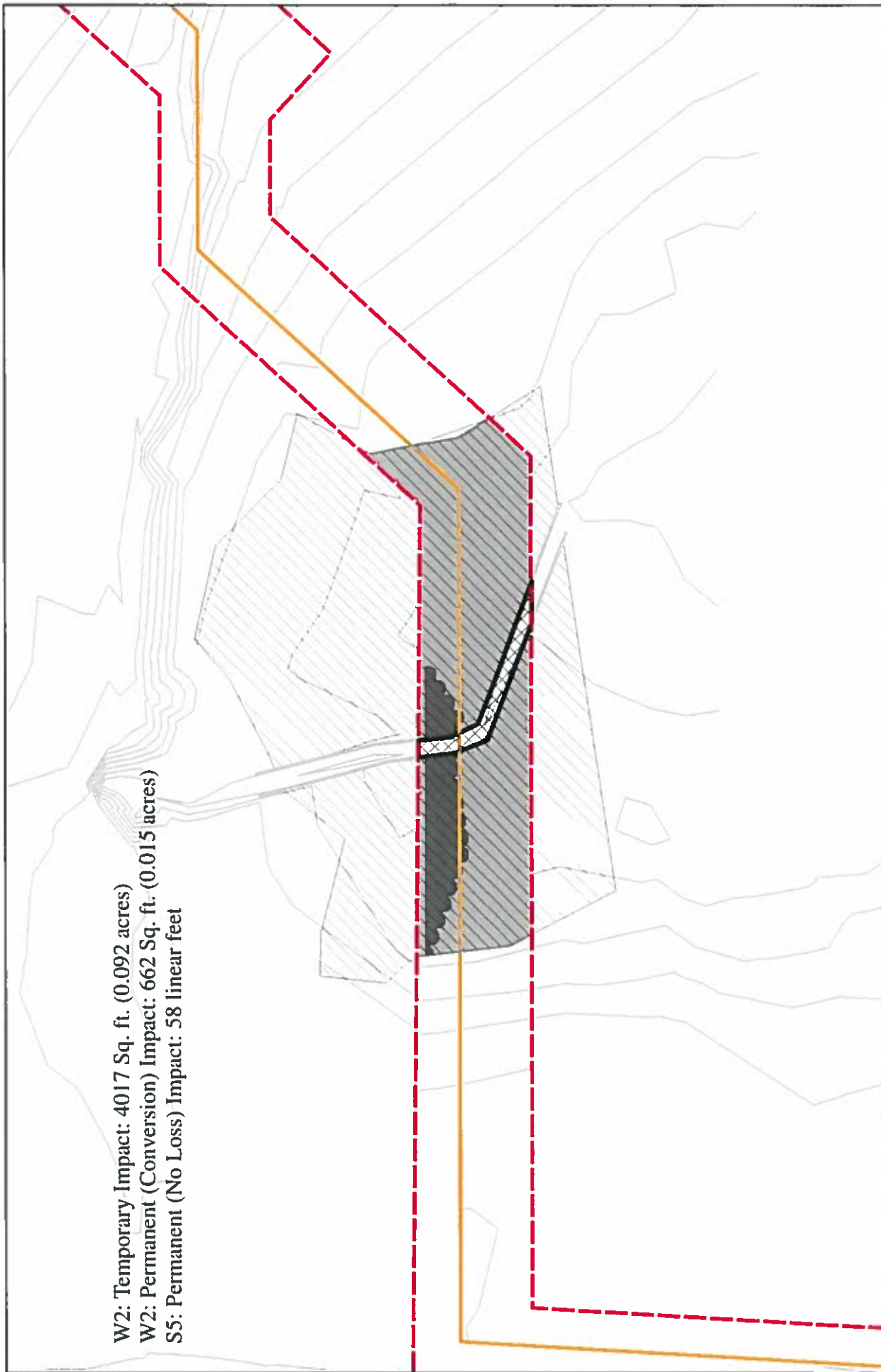
Figure 5.2:  
 Impact Site 2



S4: Permanent (No Loss) Impact: 32 linear feet

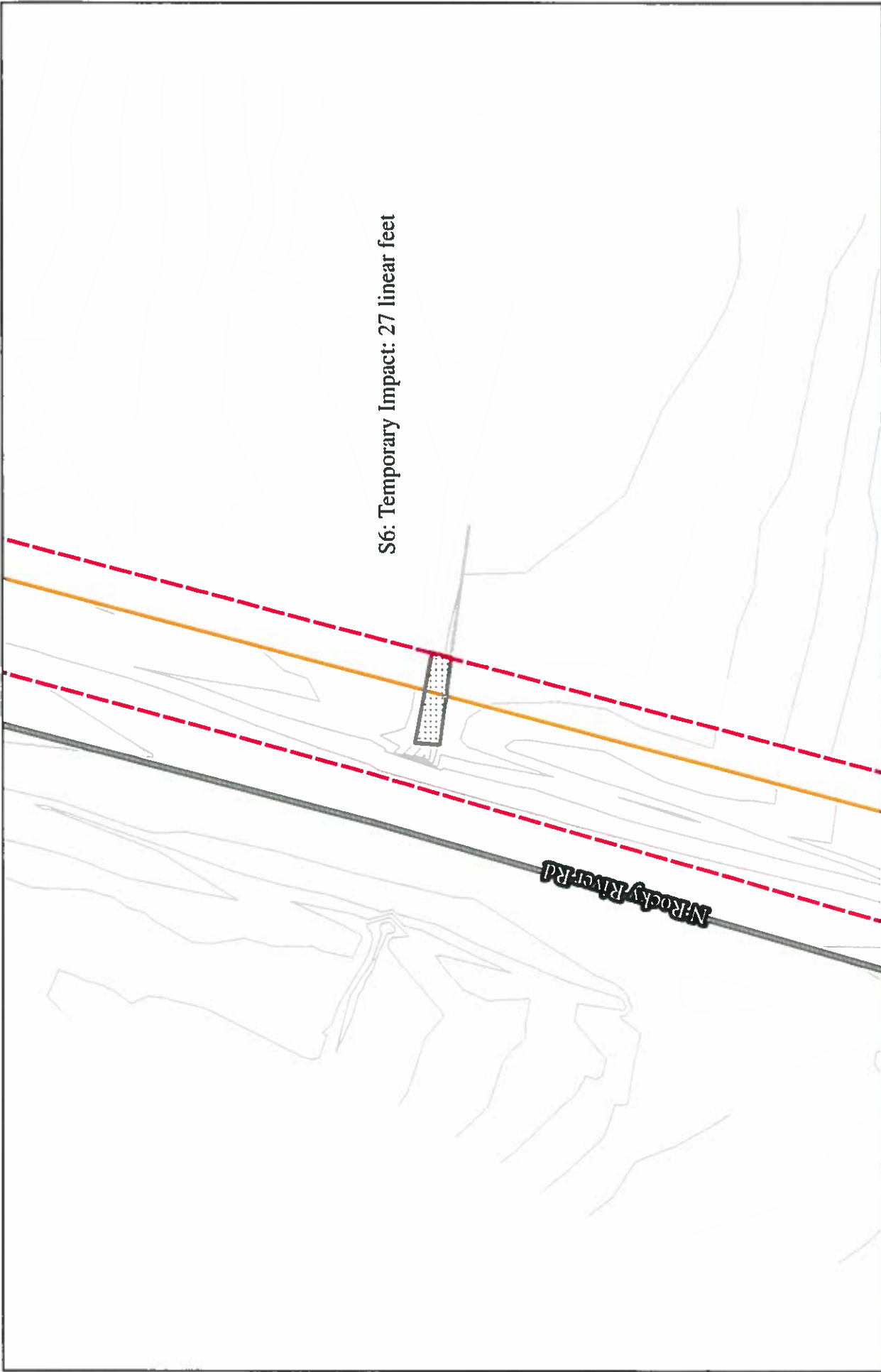
	 	<ul style="list-style-type: none"> <li> Construction Limits</li> <li> Proposed Waterline Alignment</li> <li> Permanent (No Loss) Stream Impact</li> <li> Temporary Stream Impact</li> <li> Stream Channels</li> </ul>	<ul style="list-style-type: none"> <li> Wetlands</li> <li> Permanent (Conversion) Wetland Impacts</li> <li> Temporary Wetland Impacts</li> <li> 1' Contours</li> </ul>	<b>Map Date: November 2020</b>	<b>853W Zone Improvements</b> <b>Union County, NC</b>
				Revised:	Revised:
				Revised:	<b>Figure 5.3:</b> <b>Impact Site 3</b>

W2: Temporary Impact: 4017 Sq. ft. (0.092 acres)  
 W2: Permanent (Conversion) Impact: 662 Sq. ft. (0.015 acres)  
 S5: Permanent (No Loss) Impact: 58 linear feet



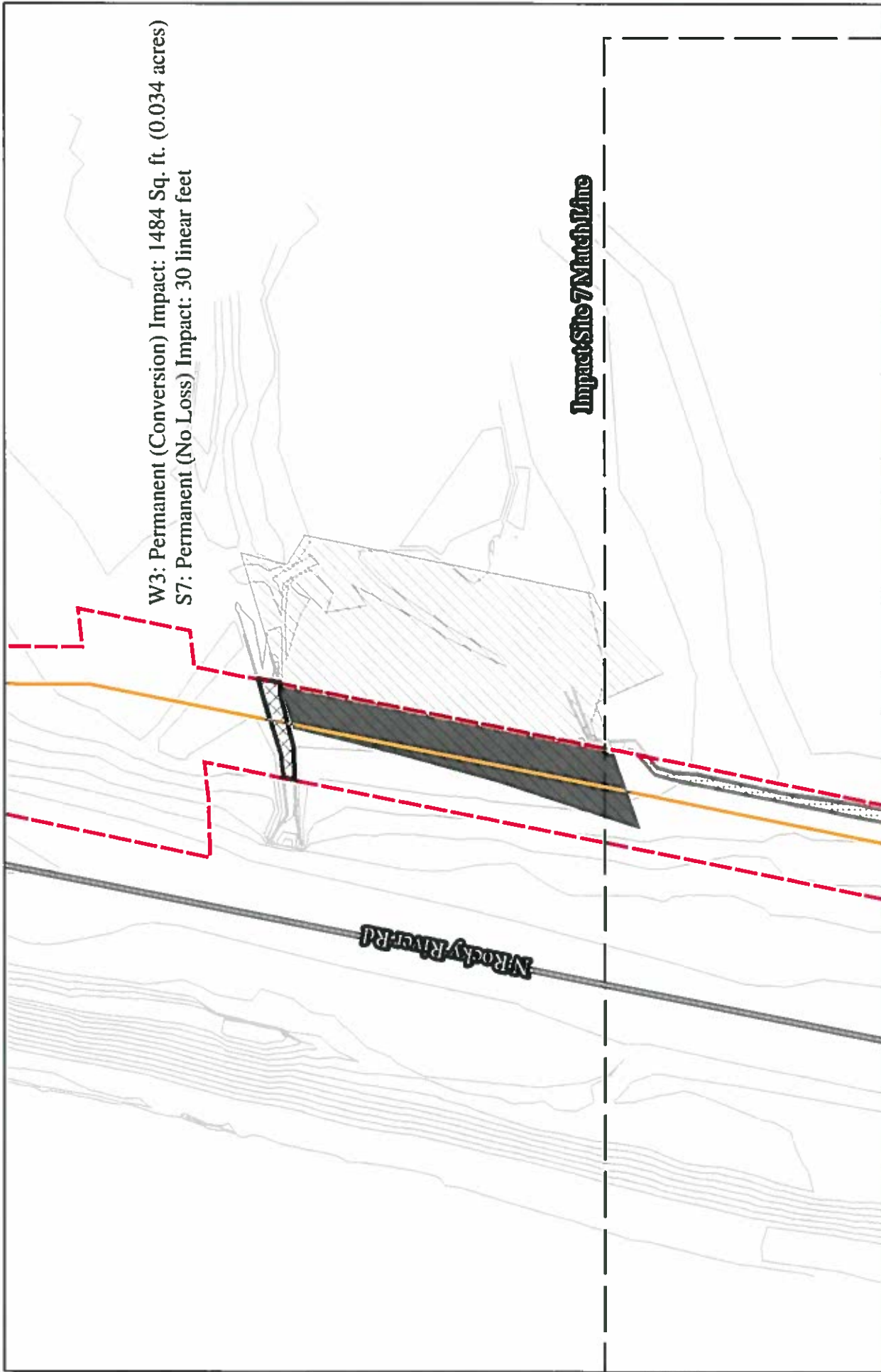
	<p>Map Date: November 2020</p>	<p>853W Zone Improvements Union County, NC</p>	
		<p>Revised:</p>	<p>Figure 5.4: Impact Site 4</p>
		<p>Revised:</p>	





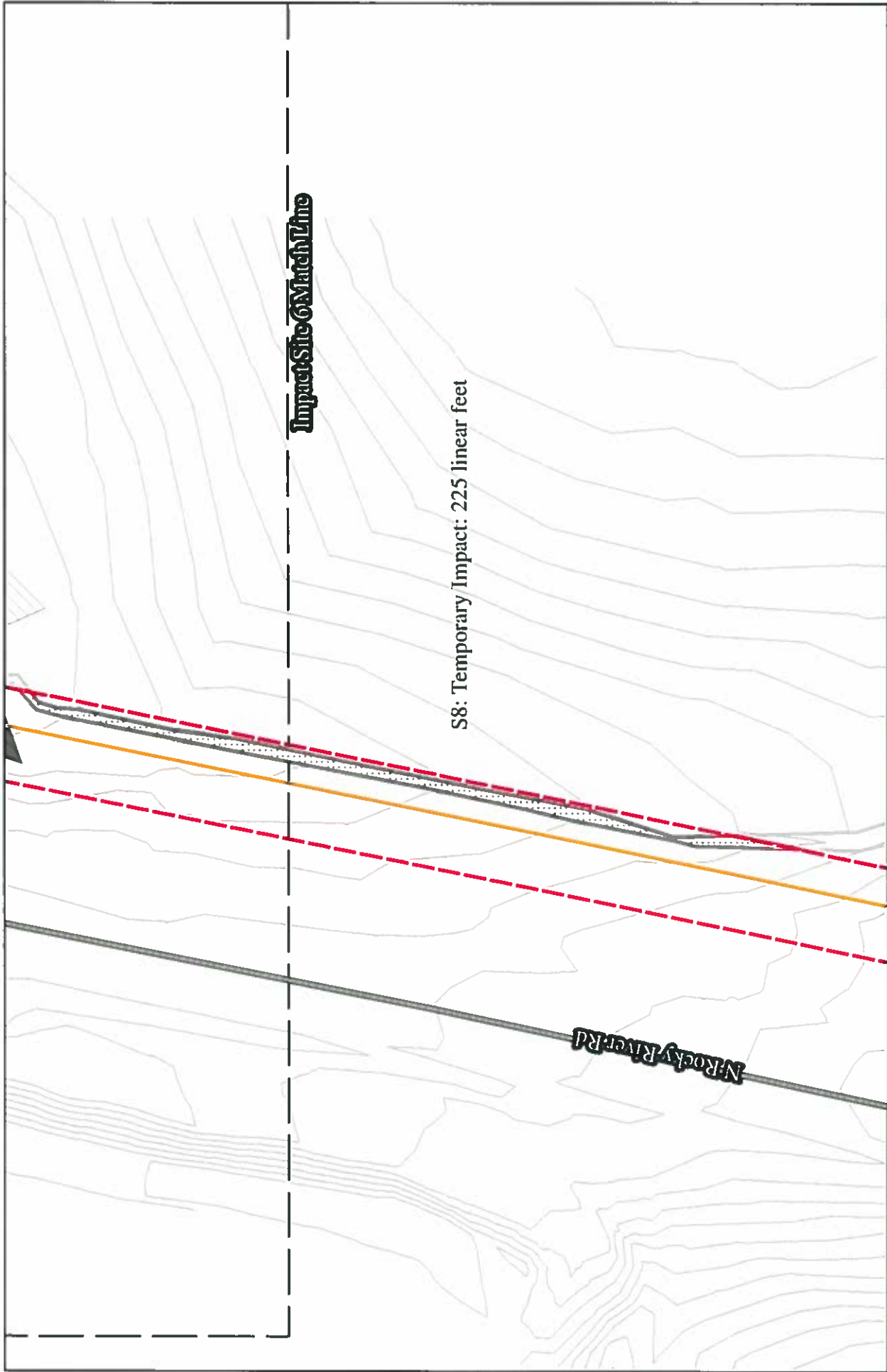
	<p>N</p> <p>0 20 40 Feet</p>	<ul style="list-style-type: none"> <li> Construction Limits</li> <li> Proposed Waterline Alignment</li> <li> Permanent (No Loss) Stream Impact</li> <li> Temporary Stream Impact</li> <li> Stream Channels</li> </ul>	<ul style="list-style-type: none"> <li> Wetlands</li> <li> Permanent (Conversion) Wetland Impacts</li> <li> Temporary Wetland Impacts</li> <li> 1' Contours</li> </ul>	<p>Map Date: November 2020</p>	<p>853W Zone Improvements Union County, NC</p>
				<p>Revised:</p>	<p>Revised:</p>
				<p>Revised:</p>	<p>Revised:</p>

**Figure 5.5:  
Impact Site 5**



	 	<ul style="list-style-type: none"> <li>Construction Limits</li> <li>Impressed Waterline Alignment</li> <li>Permanent (No Loss) Stream Impact</li> <li>Temporary Stream Impact</li> <li>Stream Channels</li> </ul>	<ul style="list-style-type: none"> <li>Wetlands</li> <li>Permanent (Conversion) Wetland Impacts</li> <li>Temporary Wetland Impacts</li> <li>1' Contours</li> </ul>	Map Date: November 2020	853W Zone Improvements Union County, NC
				Revised:	Revised:
				Revised:	Revised:

**Figure 5.6:**  
Impact Site 6



**Impact Site 6 Match Line**

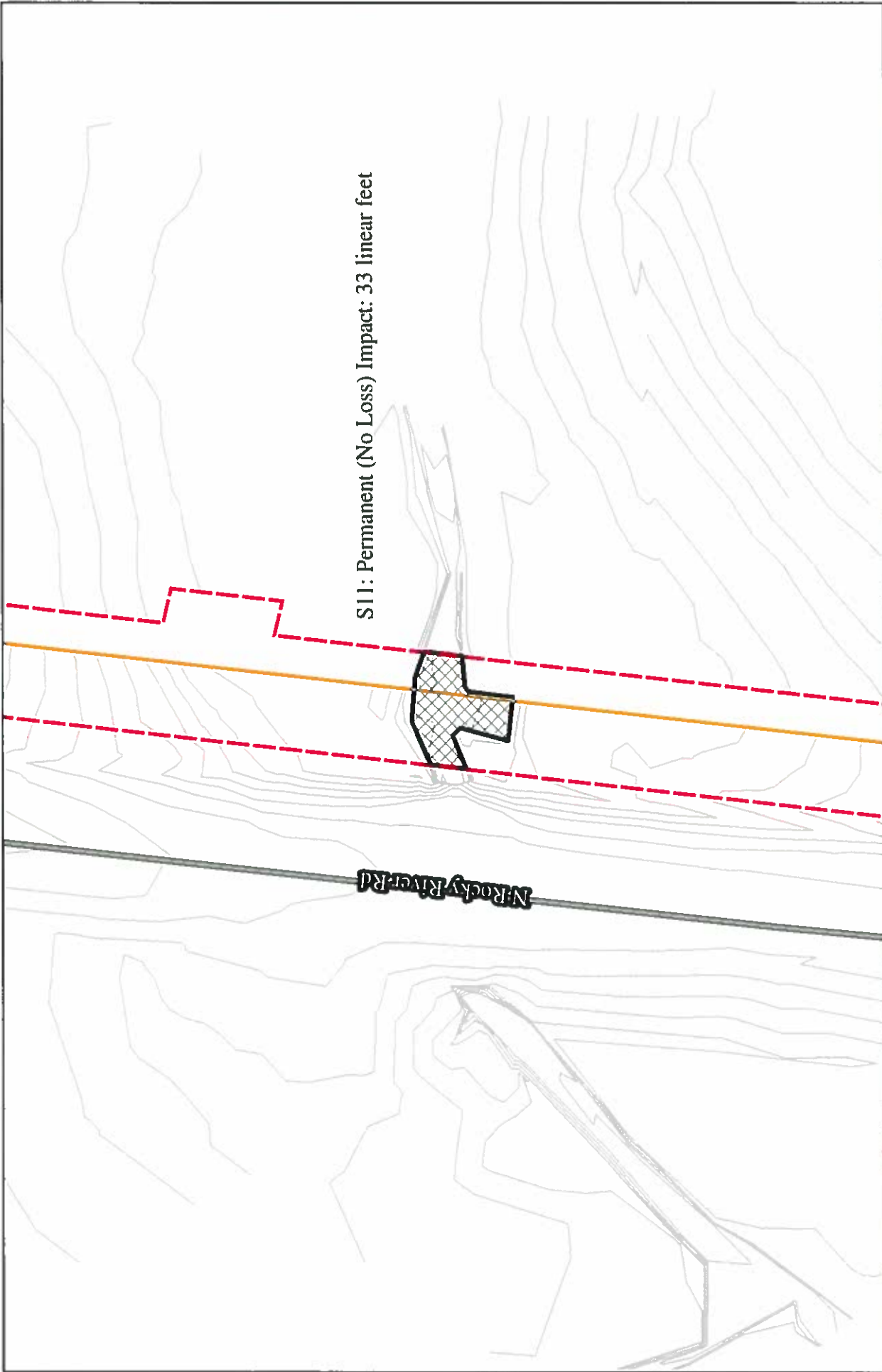
S8: Temporary Impact: 225 linear feet




**N Rocky River Rd**

	<p>N</p>		<ul style="list-style-type: none"> <li> Construction Limits</li> <li> Proposed Waterline Alignment</li> <li> Permanent (No Loss) Stream Impact</li> <li> Temporary Stream Impact</li> <li> Stream Channels</li> <li> Wetlands             <ul style="list-style-type: none"> <li> Permanent (Conversion) Wetland Impacts</li> <li> Temporary Wetland Impacts</li> <li> 1' Contours</li> </ul> </li> </ul>	<p>Map Date: November 2020</p>	<p>853W Zone Improvements Union County, NC</p>
				<p>Revised:</p>	<p>Figure 5.7: Impact Site 7</p>
				<p>Revised:</p>	
				<p>Revised:</p>	

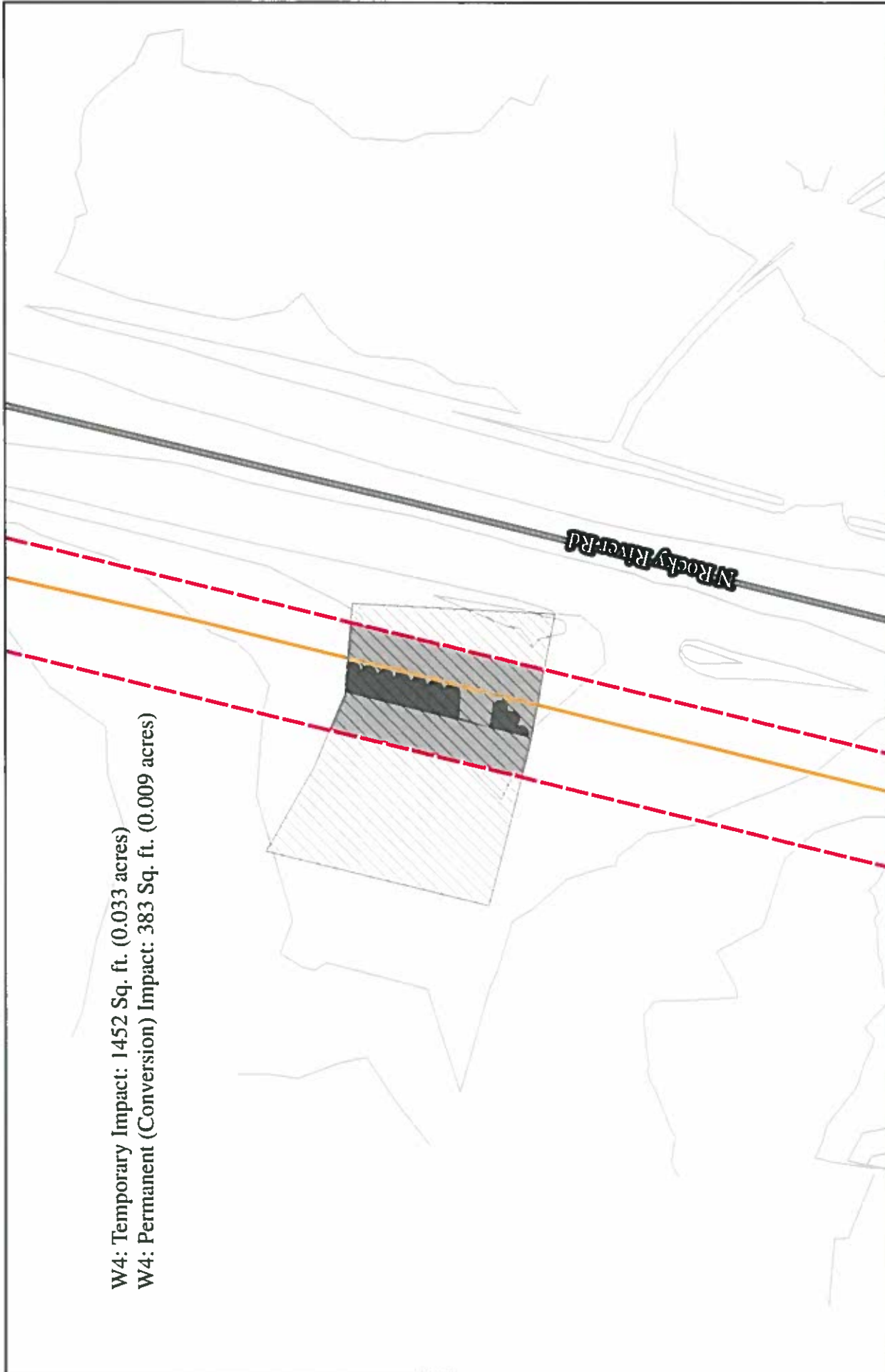


			<p>  Construction Limits   Proposed Waterline Alignment   Permanent (No Loss) Stream Impact   Temporary Stream Impact   Stream Channels         </p>		<p>  Wetlands   Permanent (Conversion) Wetland Impacts   Temporary Wetland Impacts   Construction Limits         </p>	<p>Map Date: November 2020</p>	<p>853W Zone Improvements Union County, NC</p>
			<p>Revised:</p>	<p>Revised:</p>	<p>Figure 5.8: Impact Site 8</p>		
			<p>Revised:</p>	<p>Revised:</p>			



	<p>N</p>  	<table border="0" style="width: 100%;"> <tr> <td style="width: 50%; vertical-align: top;"> <ul style="list-style-type: none"> <li> Construction Limits</li> <li> Proposed Waterline Alignment</li> <li> Permanent (No Loss) Stream Impact</li> <li> Temporary Stream Impact</li> <li> Stream Channels</li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <ul style="list-style-type: none"> <li> Wetlands</li> <li> Permanent (Conversion) Wetland Impacts</li> <li> Temporary Wetland Impacts</li> <li> E Contours</li> </ul> </td> </tr> </table>	<ul style="list-style-type: none"> <li> Construction Limits</li> <li> Proposed Waterline Alignment</li> <li> Permanent (No Loss) Stream Impact</li> <li> Temporary Stream Impact</li> <li> Stream Channels</li> </ul>	<ul style="list-style-type: none"> <li> Wetlands</li> <li> Permanent (Conversion) Wetland Impacts</li> <li> Temporary Wetland Impacts</li> <li> E Contours</li> </ul>
<ul style="list-style-type: none"> <li> Construction Limits</li> <li> Proposed Waterline Alignment</li> <li> Permanent (No Loss) Stream Impact</li> <li> Temporary Stream Impact</li> <li> Stream Channels</li> </ul>	<ul style="list-style-type: none"> <li> Wetlands</li> <li> Permanent (Conversion) Wetland Impacts</li> <li> Temporary Wetland Impacts</li> <li> E Contours</li> </ul>			
<p>Map Date: November 2020</p>		<p>853W Zone Improvements Union County, NC</p>		
<p>Revised:</p>		<p>Figure 5.9: Impact Site 9</p>		
<p>Revised:</p>				
<p>Revised:</p>				

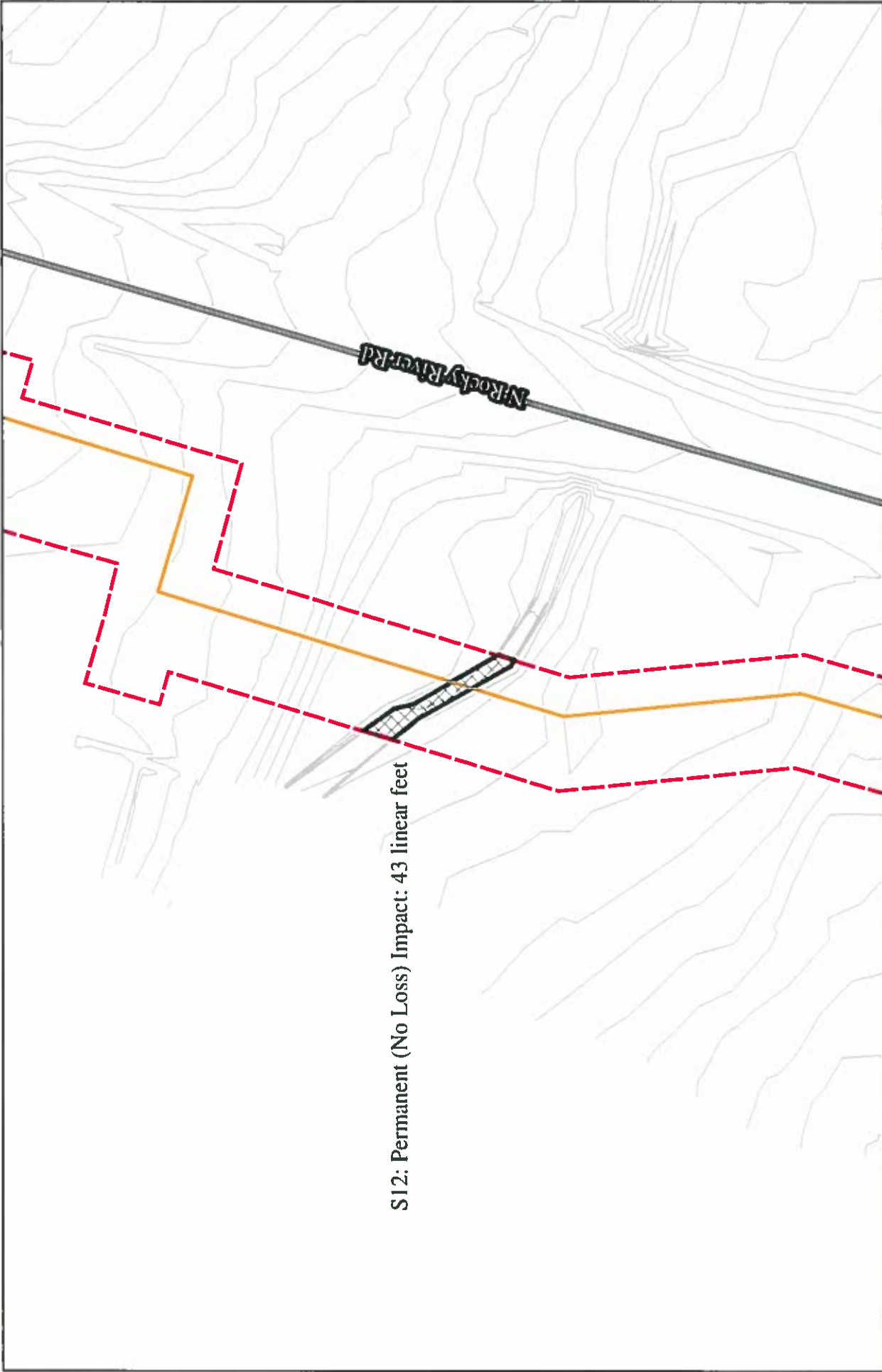
W4: Temporary Impact: 1452 Sq. ft. (0.033 acres)  
 W4: Permanent (Conversion) Impact: 383 Sq. ft. (0.009 acres)



	 	<ul style="list-style-type: none"> <li> Construction Limits</li> <li> Proposed Waterline Alignment</li> <li> Permanent (No Loss) Stream Impact</li> <li> Temporary Stream Impact</li> <li> Stream Channels</li> </ul>	<ul style="list-style-type: none"> <li> Wetlands</li> <li> Permanent (Conversion) Wetland Impacts</li> <li> Temporary Wetland Impacts</li> <li> 1' Contours</li> </ul>	Map Date: November 2020	853W Zone Improvements Union County, NC
				Revised:	Revised:
				Revised:	Revised:

Figure 5.10:  
Impact Site 10

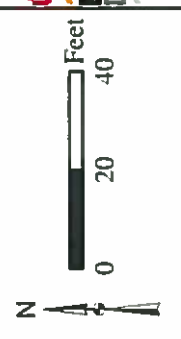


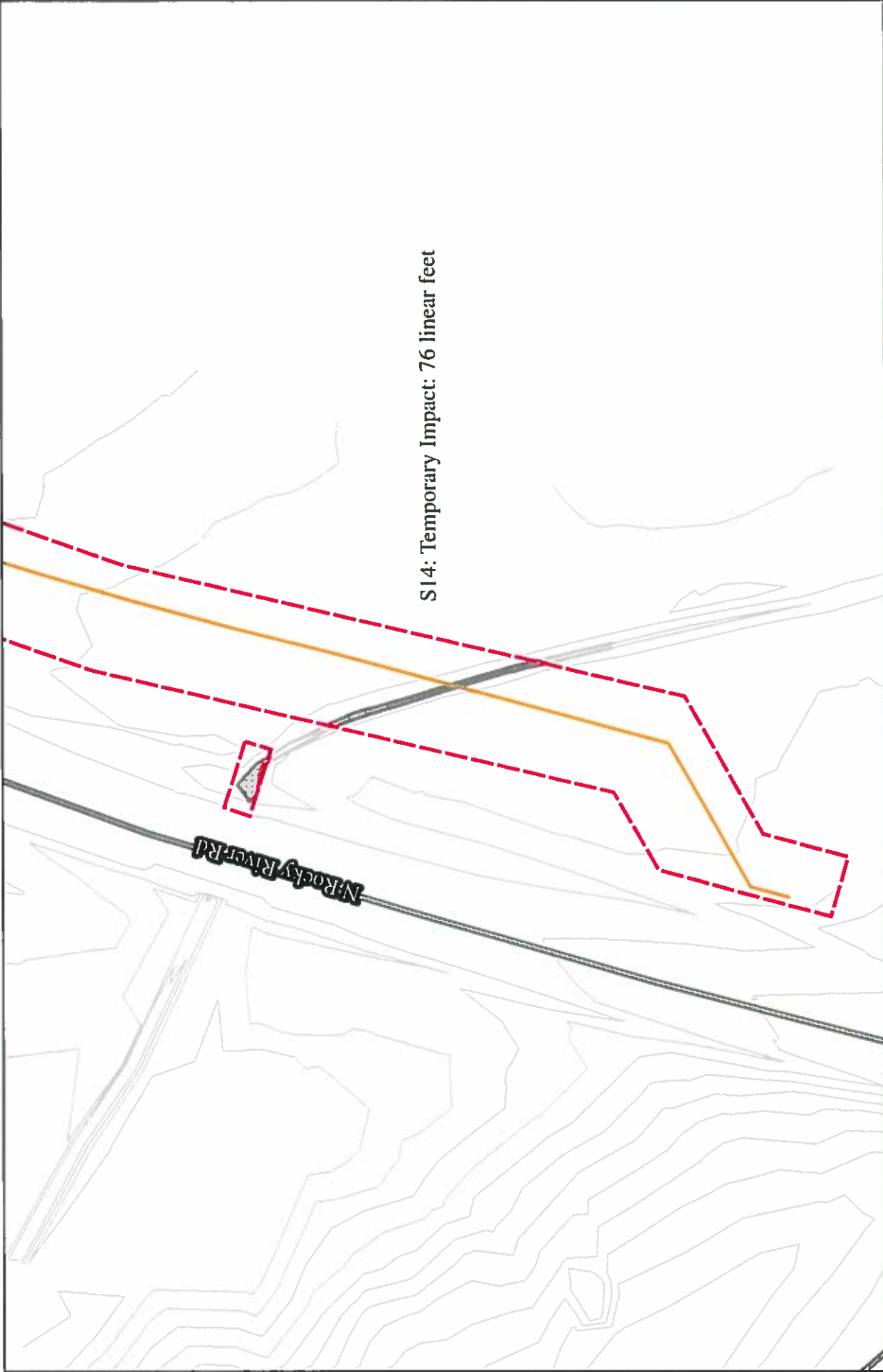


S12: Permanent (No Loss) Impact: 43 linear feet

Map Date: November 2020		853W Zone Improvements Union County, NC	
Revised:		Revised:	
Revised:		Revised:	
Revised:		Revised:	Figure 5.11: Impact Site 11

Construction Limits	Wetlands
Impaired Waterline Alignment	Permanent (Conversion) Wetland Impacts
Permanent (No Loss) Stream Impact	Temporary Wetland Impacts
Temporary Stream Impact	1' Contours
Stream Channels	





			<p>  Construction Limits   Proposed Waterline Alignment   Permanent (No Loss) Stream Impact   Temporary Stream Impact   Stream Channels         </p>	<p>  Wetlands   Permanent (Conversion) Wetland Impacts   Temporary Wetland Impacts   Contours         </p>	<p>Map Date: November 2020</p> <p>Revised:</p> <p>Revised:</p> <p>Revised:</p>	<p>853W Zone Improvements Union County, NC</p> <p>Figure 5.13: Impact Site 13</p>
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**NATIONWIDE PERMIT 12**  
**DEPARTMENT OF THE ARMY**  
**CORPS OF ENGINEERS**  
**FINAL NOTICE OF ISSUANCE AND MODIFICATION OF NATIONWIDE PERMITS**  
**FEDERAL REGISTER**  
**AUTHORIZED MARCH 19, 2017**

**Utility Line Activities.** Activities required for the construction, maintenance, repair, and removal of utility lines and associated facilities in waters of the United States, provided the activity does not result in the loss of greater than 1/2-acre of waters of the United States for each single and complete project.

Utility lines: This NWP authorizes discharges of dredged or fill material into waters of the United States and structures or work in navigable waters for crossings of those waters associated with the construction, maintenance, or repair of utility lines, including outfall and intake structures. There must be no change in pre-construction contours of waters of the United States. A “utility line” is defined as any pipe or pipeline for the transportation of any gaseous, liquid, liquescent, or slurry substance, for any purpose, and any cable, line, or wire for the transmission for any purpose of electrical energy, telephone, and telegraph messages, and internet, radio, and television communication. The term “utility line” does not include activities that drain a water of the United States, such as drainage tile or french drains, but it does apply to pipes conveying drainage from another area.

Material resulting from trench excavation may be temporarily sidecast into waters of the United States for no more than three months, provided the material is not placed in such a manner that it is dispersed by currents or other forces. The district engineer may extend the period of temporary side casting for no more than a total of 180 days, where appropriate. In wetlands, the top 6 to 12 inches of the trench should normally be backfilled with topsoil from the trench. The trench cannot be constructed or backfilled in such a manner as to drain waters of the United States (e.g., backfilling with extensive gravel layers, creating a french drain effect). Any exposed slopes and stream banks must be stabilized immediately upon completion of the utility line crossing of each waterbody.

Utility line substations: This NWP authorizes the construction, maintenance, or expansion of substation facilities associated with a power line or utility line in non-tidal waters of the United States, provided the activity, in combination with all other activities included in one single and complete project, does not result in the loss of greater than 1/2-acre of waters of the United States. This NWP does not authorize discharges into non-tidal wetlands adjacent to tidal waters of the United States to construct, maintain, or expand substation facilities.

Foundations for overhead utility line towers, poles, and anchors: This NWP authorizes the construction or maintenance of foundations for overhead utility line towers, poles, and anchors in all waters of the United States, provided the foundations are the minimum size necessary and separate footings for each tower leg (rather than a larger single pad) are used where feasible.

Access roads: This NWP authorizes the construction of access roads for the construction and maintenance of utility lines, including overhead power lines and utility line substations, in non-tidal waters of the United States, provided the activity, in combination with all other activities included in one single and complete project, does not cause the loss of greater than 1/2-acre of non-tidal waters of the United States. This NWP does not authorize discharges into non-tidal wetlands adjacent to tidal waters for access roads. Access roads must be the minimum width necessary (see Note 2, below). Access roads must be constructed so that the length of the road minimizes any adverse effects on waters of the United States and must be as near as possible to pre-construction contours and elevations (e.g., at grade corduroy roads or geotextile/gravel roads). Access roads constructed above pre-construction contours and elevations in waters of the United States must be properly bridged or culverted to maintain surface flows.

This NWP may authorize utility lines in or affecting navigable waters of the United States even if there is no associated discharge of dredged or fill material (See 33 CFR part 322). Overhead utility lines constructed over section 10 waters and utility lines that are routed in or under section 10 waters without a discharge of dredged or fill material require a section 10 permit.

This NWP authorizes, to the extent that Department of the Army authorization is required, temporary structures, fills, and work necessary for the remediation of inadvertent returns of drilling fluids to waters of the United States through sub-soil fissures or fractures that might occur during horizontal directional drilling activities conducted for the purpose of installing or replacing utility lines. These remediation activities must be done as soon as practicable, to restore the affected waterbody. District engineers may add special conditions to this NWP to require a remediation plan for addressing inadvertent returns of drilling fluids to waters of the United States during horizontal directional drilling activities conducted for the purpose of installing or replacing utility lines.

This NWP also authorizes temporary structures, fills, and work, including the use of temporary mats, necessary to conduct the utility line activity. Appropriate measures must be taken to maintain normal downstream flows and minimize flooding to the maximum extent practicable, when temporary structures, work, and discharges, including cofferdams, are necessary for construction activities, access fills, or dewatering of construction sites. Temporary fills must consist of materials, and be placed in a manner, that will not be eroded by expected high flows. After construction, temporary fills must be removed in their entirety and the affected areas returned to pre-construction elevations. The areas affected by temporary fills must be revegetated, as appropriate.

**Notification:** The permittee must submit a pre-construction notification to the district engineer prior to commencing the activity if any of the following criteria are met: (1) the activity involves mechanized land clearing in a forested wetland for the utility line right-of-way; (2) a section 10 permit is required; (3) the utility line in waters of the United States, excluding overhead lines, exceeds 500 feet; (4) the utility line is placed within a jurisdictional area (i.e., water of the United States), and it runs parallel to or along a stream bed that is within that jurisdictional area; (5) discharges that result in the loss of greater than 1/10-acre of waters of the United States; (6) permanent access roads are constructed above

grade in waters of the United States for a distance of more than 500 feet; or (7) permanent access roads are constructed in waters of the United States with impervious materials. (See general condition 32.) (Authorities: Sections 10 and 404)

**Note 1:** Where the utility line is constructed or installed in navigable waters of the United States (i.e., section 10 waters) within the coastal United States, the Great Lakes, and United States territories, a copy of the NWP verification will be sent by the Corps to the National Oceanic and Atmospheric Administration (NOAA), National Ocean Service (NOS), for charting the utility line to protect navigation.

**Note 2:** For utility line activities crossing a single waterbody more than one time at separate and distant locations, or multiple waterbodies at separate and distant locations, each crossing is considered a single and complete project for purposes of NWP authorization. Utility line activities must comply with 33 CFR 330.6(d).

**Note 3:** Utility lines consisting of aerial electric power transmission lines crossing navigable waters of the United States (which are defined at 33 CFR part 329) must comply with the applicable minimum clearances specified in 33 CFR 322.5(i).

**Note 4:** Access roads used for both construction and maintenance may be authorized, provided they meet the terms and conditions of this NWP. Access roads used solely for construction of the utility line must be removed upon completion of the work, in accordance with the requirements for temporary fills.

**Note 5:** Pipes or pipelines used to transport gaseous, liquid, liquescent, or slurry substances over navigable waters of the United States are considered to be bridges, not utility lines, and may require a permit from the U.S. Coast Guard pursuant to section 9 of the Rivers and Harbors Act of 1899. However, any discharges of dredged or fill material into waters of the United States associated with such pipelines will require a section 404 permit (see NWP 15).

**Note 6:** This NWP authorizes utility line maintenance and repair activities that do not qualify for the Clean Water Act section 404(f) exemption for maintenance of currently serviceable fills or fill structures.

**Note 7:** For overhead utility lines authorized by this NWP, a copy of the PCN and NWP verification will be provided to the Department of Defense Siting Clearinghouse, which will evaluate potential effects on military activities.

**Note 8:** For NWP 12 activities that require pre-construction notification, the PCN must include any other NWP(s), regional general permit(s), or individual permit(s) used or intended to be used to authorize any part of the proposed project or any related activity, including other separate and distant crossings that require Department of the Army authorization but do not require pre-construction notification (see paragraph (b) of general condition 32). The district engineer will evaluate the PCN in accordance with Section D, "District Engineer's Decision." The district engineer may require mitigation to ensure that the authorized activity results in no more than minimal individual and cumulative adverse environmental effects (see general condition 23).

## NATIONWIDE PERMIT GENERAL CONDITIONS

The following General Conditions must be followed in order for any authorization by a NWP to be valid:

1. Navigation. (a) No activity may cause more than a minimal adverse effect on navigation.  
(b) Any safety lights and signals prescribed by the U.S. Coast Guard, through regulations or otherwise, must be installed and maintained at the permittee's expense on authorized facilities in navigable waters of the United States.  
(c) The permittee understands and agrees that, if future operations by the United States require the removal, relocation, or other alteration, of the structure or work herein authorized, or if, in the opinion of the Secretary of the Army or his authorized representative, said structure or work shall cause unreasonable obstruction to the free navigation of the navigable waters, the permittee will be required, upon due notice from the Corps of Engineers, to remove, relocate, or alter the structural work or obstructions caused thereby, without expense to the United States. No claim shall be made against the United States on account of any such removal or alteration.
2. Aquatic Life Movements. No activity may substantially disrupt the necessary life cycle movements of those species of aquatic life indigenous to the waterbody, including those species that normally migrate through the area, unless the activity's primary purpose is to impound water. All permanent and temporary crossings of waterbodies shall be suitably culverted, bridged, or otherwise designed and constructed to maintain low flows to sustain the movement of those aquatic species. If a bottomless culvert cannot be used, then the crossing should be designed and constructed to minimize adverse effects to aquatic life movements.
3. Spawning Areas. Activities in spawning areas during spawning seasons must be avoided to the maximum extent practicable. Activities that result in the physical destruction (e.g., through excavation, fill, or downstream smothering by substantial turbidity) of an important spawning area are not authorized.
4. Migratory Bird Breeding Areas. Activities in waters of the United States that serve as breeding areas for migratory birds must be avoided to the maximum extent practicable.
5. Shellfish Beds. No activity may occur in areas of concentrated shellfish populations, unless the activity is directly related to a shellfish harvesting activity authorized by NWPs 4 and 48, or is a shellfish seeding or habitat restoration activity authorized by NWP 27.
6. Suitable Material. No activity may use unsuitable material (e.g., trash, debris, car bodies, asphalt, etc.). Material used for construction or discharged must be free from toxic pollutants in toxic amounts (see section 307 of the Clean Water Act).

7. Water Supply Intakes. No activity may occur in the proximity of a public water supply intake, except where the activity is for the repair or improvement of public water supply intake structures or adjacent bank stabilization.

8. Adverse Effects From Impoundments. If the activity creates an impoundment of water, adverse effects to the aquatic system due to accelerating the passage of water, and/or restricting its flow must be minimized to the maximum extent practicable.

9. Management of Water Flows. To the maximum extent practicable, the pre-construction course, condition, capacity, and location of open waters must be maintained for each activity, including stream channelization, storm water management activities, and temporary and permanent road crossings, except as provided below. The activity must be constructed to withstand expected high flows. The activity must not restrict or impede the passage of normal or high flows, unless the primary purpose of the activity is to impound water or manage high flows. The activity may alter the pre-construction course, condition, capacity, and location of open waters if it benefits the aquatic environment (e.g., stream restoration or relocation activities).

10. Fills Within 100-Year Floodplains. The activity must comply with applicable FEMA-approved state or local floodplain management requirements.

11. Equipment. Heavy equipment working in wetlands or mudflats must be placed on mats, or other measures must be taken to minimize soil disturbance.

12. Soil Erosion and Sediment Controls. Appropriate soil erosion and sediment controls must be used and maintained in effective operating condition during construction, and all exposed soil and other fills, as well as any work below the ordinary high water mark or high tide line, must be permanently stabilized at the earliest practicable date. Permittees are encouraged to perform work within waters of the United States during periods of low-flow or no-flow, or during low tides.

13. Removal of Temporary Fills. Temporary fills must be removed in their entirety and the affected areas returned to pre-construction elevations. The affected areas must be revegetated, as appropriate.

14. Proper Maintenance. Any authorized structure or fill shall be properly maintained, including maintenance to ensure public safety and compliance with applicable NWP general conditions, as well as any activity-specific conditions added by the district engineer to an NWP authorization.

15. Single and Complete Project. The activity must be a single and complete project. The same NWP cannot be used more than once for the same single and complete project.

16. Wild and Scenic Rivers. (a) No NWP activity may occur in a component of the National Wild and Scenic River System, or in a river officially designated by Congress as a “study river” for possible inclusion in the system while the river is in an official study status,

unless the appropriate Federal agency with direct management responsibility for such river, has determined in writing that the proposed activity will not adversely affect the Wild and Scenic River designation or study status.

(b) If a proposed NWP activity will occur in a component of the National Wild and Scenic River System, or in a river officially designated by Congress as a “study river” for possible inclusion in the system while the river is in an official study status, the permittee must submit a pre-construction notification (see general condition 32). The district engineer will coordinate the PCN with the Federal agency with direct management responsibility for that river. The permittee shall not begin the NWP activity until notified by the district engineer that the Federal agency with direct management responsibility for that river has determined in writing that the proposed NWP activity will not adversely affect the Wild and Scenic River designation or study status.

(c) Information on Wild and Scenic Rivers may be obtained from the appropriate Federal land management agency responsible for the designated Wild and Scenic River or study river (e.g., National Park Service, U.S. Forest Service, Bureau of Land Management, U.S. Fish and Wildlife Service). Information on these rivers is also available at: <http://www.rivers.gov/>.

17. Tribal Rights. No NWP activity may cause more than minimal adverse effects on tribal rights (including treaty rights), protected tribal resources, or tribal lands.

18. Endangered Species. (a) No activity is authorized under any NWP which is likely to directly or indirectly jeopardize the continued existence of a threatened or endangered species or a species proposed for such designation, as identified under the Federal Endangered Species Act (ESA), or which will directly or indirectly destroy or adversely modify the critical habitat of such species. No activity is authorized under any NWP which “may affect” a listed species or critical habitat, unless ESA section 7 consultation addressing the effects of the proposed activity has been completed. Direct effects are the immediate effects on listed species and critical habitat caused by the NWP activity. Indirect effects are those effects on listed species and critical habitat that are caused by the NWP activity and are later in time, but still are reasonably certain to occur.

(b) Federal agencies should follow their own procedures for complying with the requirements of the ESA. If pre-construction notification is required for the proposed activity, the Federal permittee must provide the district engineer with the appropriate documentation to demonstrate compliance with those requirements. The district engineer will verify that the appropriate documentation has been submitted. If the appropriate documentation has not been submitted, additional ESA section 7 consultation may be necessary for the activity and the respective federal agency would be responsible for fulfilling its obligation under section 7 of the ESA.

(c) Non-federal permittees must submit a pre-construction notification to the district engineer if any listed species or designated critical habitat might be affected or is in the vicinity of the activity, or if the activity is located in designated critical habitat, and shall not begin work on the activity until notified by the district engineer that the requirements of the ESA have been satisfied and that the activity is authorized. For activities that might affect Federally-listed endangered or threatened species or designated critical habitat, the pre-construction notification must include the name(s) of the endangered or threatened species that

might be affected by the proposed activity or that utilize the designated critical habitat that might be affected by the proposed activity. The district engineer will determine whether the proposed activity “may affect” or will have “no effect” to listed species and designated critical habitat and will notify the non-Federal applicant of the Corps’ determination within 45 days of receipt of a complete pre-construction notification. In cases where the non-Federal applicant has identified listed species or critical habitat that might be affected or is in the vicinity of the activity, and has so notified the Corps, the applicant shall not begin work until the Corps has provided notification that the proposed activity will have “no effect” on listed species or critical habitat, or until ESA section 7 consultation has been completed. If the non-Federal applicant has not heard back from the Corps within 45 days, the applicant must still wait for notification from the Corps.

(d) As a result of formal or informal consultation with the FWS or NMFS the district engineer may add species-specific permit conditions to the NWP.

(e) Authorization of an activity by an NWP does not authorize the “take” of a threatened or endangered species as defined under the ESA. In the absence of separate authorization (e.g., an ESA Section 10 Permit, a Biological Opinion with “incidental take” provisions, etc.) from the FWS or the NMFS, the Endangered Species Act prohibits any person subject to the jurisdiction of the United States to take a listed species, where “take” means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. The word “harm” in the definition of “take” means an act which actually kills or injures wildlife. Such an act may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering.

(f) If the non-federal permittee has a valid ESA section 10(a)(1)(B) incidental take permit with an approved Habitat Conservation Plan for a project or a group of projects that includes the proposed NWP activity, the non-federal applicant should provide a copy of that ESA section 10(a)(1)(B) permit with the PCN required by paragraph (c) of this general condition. The district engineer will coordinate with the agency that issued the ESA section 10(a)(1)(B) permit to determine whether the proposed NWP activity and the associated incidental take were considered in the internal ESA section 7 consultation conducted for the ESA section 10(a)(1)(B) permit. If that coordination results in concurrence from the agency that the proposed NWP activity and the associated incidental take were considered in the internal ESA section 7 consultation for the ESA section 10(a)(1)(B) permit, the district engineer does not need to conduct a separate ESA section 7 consultation for the proposed NWP activity. The district engineer will notify the non-federal applicant within 45 days of receipt of a complete pre-construction notification whether the ESA section 10(a)(1)(B) permit covers the proposed NWP activity or whether additional ESA section 7 consultation is required.

(g) Information on the location of threatened and endangered species and their critical habitat can be obtained directly from the offices of the FWS and NMFS or their world wide web pages at <http://www.fws.gov/> or <http://www.fws.gov/ipac> and <http://www.nmfs.noaa.gov/pr/species/esa/> respectively.

19. Migratory Birds and Bald and Golden Eagles. The permittee is responsible for ensuring their action complies with the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act. The permittee is responsible for contacting appropriate local office of the U.S. Fish and Wildlife Service to determine applicable measures to reduce impacts to migratory

birds or eagles, including whether “incidental take” permits are necessary and available under the Migratory Bird Treaty Act or Bald and Golden Eagle Protection Act for a particular activity.

20. Historic Properties. (a) In cases where the district engineer determines that the activity may have the potential to cause effects to properties listed, or eligible for listing, in the National Register of Historic Places, the activity is not authorized, until the requirements of Section 106 of the National Historic Preservation Act (NHPA) have been satisfied.

(b) Federal permittees should follow their own procedures for complying with the requirements of section 106 of the National Historic Preservation Act. If pre-construction notification is required for the proposed NWP activity, the Federal permittee must provide the district engineer with the appropriate documentation to demonstrate compliance with those requirements. The district engineer will verify that the appropriate documentation has been submitted. If the appropriate documentation is not submitted, then additional consultation under section 106 may be necessary. The respective federal agency is responsible for fulfilling its obligation to comply with section 106.

(c) Non-federal permittees must submit a pre-construction notification to the district engineer if the NWP activity might have the potential to cause effects to any historic properties listed on, determined to be eligible for listing on, or potentially eligible for listing on the National Register of Historic Places, including previously unidentified properties. For such activities, the pre-construction notification must state which historic properties might have the potential to be affected by the proposed NWP activity or include a vicinity map indicating the location of the historic properties or the potential for the presence of historic properties. Assistance regarding information on the location of, or potential for, the presence of historic properties can be sought from the State Historic Preservation Officer, Tribal Historic Preservation Officer, or designated tribal representative, as appropriate, and the National Register of Historic Places (see 33 CFR 330.4(g)). When reviewing pre-construction notifications, district engineers will comply with the current procedures for addressing the requirements of section 106 of the National Historic Preservation Act. The district engineer shall make a reasonable and good faith effort to carry out appropriate identification efforts, which may include background research, consultation, oral history interviews, sample field investigation, and field survey. Based on the information submitted in the PCN and these identification efforts, the district engineer shall determine whether the proposed NWP activity has the potential to cause effects on the historic properties. Section 106 consultation is not required when the district engineer determines that the activity does not have the potential to cause effects on historic properties (see 36 CFR 800.3(a)). Section 106 consultation is required when the district engineer determines that the activity has the potential to cause effects on historic properties. The district engineer will conduct consultation with consulting parties identified under 36 CFR 800.2(c) when he or she makes any of the following effect determinations for the purposes of section 106 of the NHPA: no historic properties affected, no adverse effect, or adverse effect. Where the non-Federal applicant has identified historic properties on which the activity might have the potential to cause effects and so notified the Corps, the non-Federal applicant shall not begin the activity until notified by the district engineer either that the activity has no potential to cause effects to historic properties or that NHPA section 106 consultation has been completed.



(d) For non-federal permittees, the district engineer will notify the prospective permittee within 45 days of receipt of a complete pre-construction notification whether NHPA section 106 consultation is required. If NHPA section 106 consultation is required, the district engineer will notify the non-Federal applicant that he or she cannot begin the activity until section 106 consultation is completed. If the non-Federal applicant has not heard back from the Corps within 45 days, the applicant must still wait for notification from the Corps.

(e) Prospective permittees should be aware that section 110k of the NHPA (54 U.S.C. 306113) prevents the Corps from granting a permit or other assistance to an applicant who, with intent to avoid the requirements of section 106 of the NHPA, has intentionally significantly adversely affected a historic property to which the permit would relate, or having legal power to prevent it, allowed such significant adverse effect to occur, unless the Corps, after consultation with the Advisory Council on Historic Preservation (ACHP), determines that circumstances justify granting such assistance despite the adverse effect created or permitted by the applicant. If circumstances justify granting the assistance, the Corps is required to notify the ACHP and provide documentation specifying the circumstances, the degree of damage to the integrity of any historic properties affected, and proposed mitigation. This documentation must include any views obtained from the applicant, SHPO/THPO, appropriate Indian tribes if the undertaking occurs on or affects historic properties on tribal lands or affects properties of interest to those tribes, and other parties known to have a legitimate interest in the impacts to the permitted activity on historic properties.

21. Discovery of Previously Unknown Remains and Artifacts. If you discover any previously unknown historic, cultural or archeological remains and artifacts while accomplishing the activity authorized by this permit, you must immediately notify the district engineer of what you have found, and to the maximum extent practicable, avoid construction activities that may affect the remains and artifacts until the required coordination has been completed. The district engineer will initiate the Federal, Tribal, and state coordination required to determine if the items or remains warrant a recovery effort or if the site is eligible for listing in the National Register of Historic Places.

22. Designated Critical Resource Waters. Critical resource waters include, NOAA-managed marine sanctuaries and marine monuments, and National Estuarine Research Reserves. The district engineer may designate, after notice and opportunity for public comment, additional waters officially designated by a state as having particular environmental or ecological significance, such as outstanding national resource waters or state natural heritage sites. The district engineer may also designate additional critical resource waters after notice and opportunity for public comment.

(a) Discharges of dredged or fill material into waters of the United States are not authorized by NWPs 7, 12, 14, 16, 17, 21, 29, 31, 35, 39, 40, 42, 43, 44, 49, 50, 51, and 52 for any activity within, or directly affecting, critical resource waters, including wetlands adjacent to such waters.

(b) For NWPs 3, 8, 10, 13, 15, 18, 19, 22, 23, 25, 27, 28, 30, 33, 34, 36, 37, 38, and 54, notification is required in accordance with general condition 32, for any activity proposed in the designated critical resource waters including wetlands adjacent to those waters. The district engineer may authorize activities under these NWPs only after it is determined that the impacts to the critical resource waters will be no more than minimal.

23. Mitigation. The district engineer will consider the following factors when determining appropriate and practicable mitigation necessary to ensure that the individual and cumulative adverse environmental effects are no more than minimal:

(a) The activity must be designed and constructed to avoid and minimize adverse effects, both temporary and permanent, to waters of the United States to the maximum extent practicable at the project site (i.e., on site).

(b) Mitigation in all its forms (avoiding, minimizing, rectifying, reducing, or compensating for resource losses) will be required to the extent necessary to ensure that the individual and cumulative adverse environmental effects are no more than minimal.

(c) Compensatory mitigation at a minimum one-for-one ratio will be required for all wetland losses that exceed 1/10-acre and require pre-construction notification, unless the district engineer determines in writing that either some other form of mitigation would be more environmentally appropriate or the adverse environmental effects of the proposed activity are no more than minimal, and provides an activity-specific waiver of this requirement. For wetland losses of 1/10-acre or less that require pre-construction notification, the district engineer may determine on a case-by-case basis that compensatory mitigation is required to ensure that the activity results in only minimal adverse environmental effects.

(d) For losses of streams or other open waters that require pre-construction notification, the district engineer may require compensatory mitigation to ensure that the activity results in no more than minimal adverse environmental effects. Compensatory mitigation for losses of streams should be provided, if practicable, through stream rehabilitation, enhancement, or preservation, since streams are difficult-to-replace resources (see 33 CFR 332.3(e)(3)).

(e) Compensatory mitigation plans for NWP activities in or near streams or other open waters will normally include a requirement for the restoration or enhancement, maintenance, and legal protection (e.g., conservation easements) of riparian areas next to open waters. In some cases, the restoration or maintenance/protection of riparian areas may be the only compensatory mitigation required. Restored riparian areas should consist of native species. The width of the required riparian area will address documented water quality or aquatic habitat loss concerns. Normally, the riparian area will be 25 to 50 feet wide on each side of the stream, but the district engineer may require slightly wider riparian areas to address documented water quality or habitat loss concerns. If it is not possible to restore or maintain/protect a riparian area on both sides of a stream, or if the waterbody is a lake or coastal waters, then restoring or maintaining/protecting a riparian area along a single bank or shoreline may be sufficient. Where both wetlands and open waters exist on the project site, the district engineer will determine the appropriate compensatory mitigation (e.g., riparian areas and/or wetlands compensation) based on what is best for the aquatic environment on a watershed basis. In cases where riparian areas are determined to be the most appropriate form of minimization or compensatory mitigation, the district engineer may waive or reduce the requirement to provide wetland compensatory mitigation for wetland losses.

(f) Compensatory mitigation projects provided to offset losses of aquatic resources must comply with the applicable provisions of 33 CFR part 332.

(1) The prospective permittee is responsible for proposing an appropriate compensatory mitigation option if compensatory mitigation is necessary to ensure that the activity results in no more than minimal adverse environmental effects. For the NWPs, the preferred mechanism for providing compensatory mitigation is mitigation bank credits or in-

lieu fee program credits (see 33 CFR 332.3(b)(2) and (3)). However, if an appropriate number and type of mitigation bank or in-lieu credits are not available at the time the PCN is submitted to the district engineer, the district engineer may approve the use of permittee-responsible mitigation.

(2) The amount of compensatory mitigation required by the district engineer must be sufficient to ensure that the authorized activity results in no more than minimal individual and cumulative adverse environmental effects (see 33 CFR 330.1(e)(3)). (See also 33 CFR 332.3(f)).

(3) Since the likelihood of success is greater and the impacts to potentially valuable uplands are reduced, aquatic resource restoration should be the first compensatory mitigation option considered for permittee-responsible mitigation.

(4) If permittee-responsible mitigation is the proposed option, the prospective permittee is responsible for submitting a mitigation plan. A conceptual or detailed mitigation plan may be used by the district engineer to make the decision on the NWP verification request, but a final mitigation plan that addresses the applicable requirements of 33 CFR 332.4(c)(2) through (14) must be approved by the district engineer before the permittee begins work in waters of the United States, unless the district engineer determines that prior approval of the final mitigation plan is not practicable or not necessary to ensure timely completion of the required compensatory mitigation (see 33 CFR 332.3(k)(3)).

(5) If mitigation bank or in-lieu fee program credits are the proposed option, the mitigation plan only needs to address the baseline conditions at the impact site and the number of credits to be provided.

(6) Compensatory mitigation requirements (e.g., resource type and amount to be provided as compensatory mitigation, site protection, ecological performance standards, monitoring requirements) may be addressed through conditions added to the NWP authorization, instead of components of a compensatory mitigation plan (see 33 CFR 332.4(c)(1)(ii)).

(g) Compensatory mitigation will not be used to increase the acreage losses allowed by the acreage limits of the NWPs. For example, if an NWP has an acreage limit of 1/2-acre, it cannot be used to authorize any NWP activity resulting in the loss of greater than 1/2-acre of waters of the United States, even if compensatory mitigation is provided that replaces or restores some of the lost waters. However, compensatory mitigation can and should be used, as necessary, to ensure that an NWP activity already meeting the established acreage limits also satisfies the no more than minimal impact requirement for the NWPs.

(h) Permittees may propose the use of mitigation banks, in-lieu fee programs, or permittee-responsible mitigation. When developing a compensatory mitigation proposal, the permittee must consider appropriate and practicable options consistent with the framework at 33 CFR 332.3(b). For activities resulting in the loss of marine or estuarine resources, permittee-responsible mitigation may be environmentally preferable if there are no mitigation banks or in-lieu fee programs in the area that have marine or estuarine credits available for sale or transfer to the permittee. For permittee-responsible mitigation, the special conditions of the NWP verification must clearly indicate the party or parties responsible for the implementation and performance of the compensatory mitigation project, and, if required, its long-term management.

(i) Where certain functions and services of waters of the United States are permanently adversely affected by a regulated activity, such as discharges of dredged or fill

material into waters of the United States that will convert a forested or scrub-shrub wetland to a herbaceous wetland in a permanently maintained utility line right-of-way, mitigation may be required to reduce the adverse environmental effects of the activity to the no more than minimal level.

24. Safety of Impoundment Structures. To ensure that all impoundment structures are safely designed, the district engineer may require non-Federal applicants to demonstrate that the structures comply with established state dam safety criteria or have been designed by qualified persons. The district engineer may also require documentation that the design has been independently reviewed by similarly qualified persons, and appropriate modifications made to ensure safety.

25. Water Quality. Where States and authorized Tribes, or EPA where applicable, have not previously certified compliance of an NWP with CWA section 401, individual 401 Water Quality Certification must be obtained or waived (see 33 CFR 330.4(c)). The district engineer or State or Tribe may require additional water quality management measures to ensure that the authorized activity does not result in more than minimal degradation of water quality.

26. Coastal Zone Management. In coastal states where an NWP has not previously received a state coastal zone management consistency concurrence, an individual state coastal zone management consistency concurrence must be obtained, or a presumption of concurrence must occur (see 33 CFR 330.4(d)). The district engineer or a State may require additional measures to ensure that the authorized activity is consistent with state coastal zone management requirements.

27. Regional and Case-By-Case Conditions. The activity must comply with any regional conditions that may have been added by the Division Engineer (see 33 CFR 330.4(e)) and with any case specific conditions added by the Corps or by the state, Indian Tribe, or U.S. EPA in its section 401 Water Quality Certification, or by the state in its Coastal Zone Management Act consistency determination.

28. Use of Multiple Nationwide Permits. The use of more than one NWP for a single and complete project is prohibited, except when the acreage loss of waters of the United States authorized by the NWPs does not exceed the acreage limit of the NWP with the highest specified acreage limit. For example, if a road crossing over tidal waters is constructed under NWP 14, with associated bank stabilization authorized by NWP 13, the maximum acreage loss of waters of the United States for the total project cannot exceed 1/3-acre.

29. Transfer of Nationwide Permit Verifications. If the permittee sells the property associated with a nationwide permit verification, the permittee may transfer the nationwide permit verification to the new owner by submitting a letter to the appropriate Corps district office to validate the transfer. A copy of the nationwide permit verification must be attached to the letter, and the letter must contain the following statement and signature:  
“When the structures or work authorized by this nationwide permit are still in existence at the time the property is transferred, the terms and conditions of this nationwide permit, including any special conditions, will continue to be binding on the new owner(s) of the property. To

validate the transfer of this nationwide permit and the associated liabilities associated with compliance with its terms and conditions, have the transferee sign and date below.”

\_\_\_\_\_  
(Transferee)

\_\_\_\_\_  
(Date)

30. Compliance Certification. Each permittee who receives an NWP verification letter from the Corps must provide a signed certification documenting completion of the authorized activity and implementation of any required compensatory mitigation. The success of any required permittee-responsible mitigation, including the achievement of ecological performance standards, will be addressed separately by the district engineer. The Corps will provide the permittee the certification document with the NWP verification letter. The certification document will include:

(a) A statement that the authorized activity was done in accordance with the NWP authorization, including any general, regional, or activity-specific conditions;

(b) A statement that the implementation of any required compensatory mitigation was completed in accordance with the permit conditions. If credits from a mitigation bank or in-lieu fee program are used to satisfy the compensatory mitigation requirements, the certification must include the documentation required by 33 CFR 332.3(l)(3) to confirm that the permittee secured the appropriate number and resource type of credits; and

(c) The signature of the permittee certifying the completion of the activity and mitigation.

The completed certification document must be submitted to the district engineer within 30 days of completion of the authorized activity or the implementation of any required compensatory mitigation, whichever occurs later.

31. Activities Affecting Structures or Works Built by the United States. If an NWP activity also requires permission from the Corps pursuant to 33 U.S.C. 408 because it will alter or temporarily or permanently occupy or use a U.S. Army Corps of Engineers (USACE) federally authorized Civil Works project (a “USACE project”), the prospective permittee must submit a pre-construction notification. See paragraph (b)(10) of general condition 32. An activity that requires section 408 permission is not authorized by NWP until the appropriate Corps office issues the section 408 permission to alter, occupy, or use the USACE project, and the district engineer issues a written NWP verification.

32. Pre-Construction Notification. (a) Timing. Where required by the terms of the NWP, the prospective permittee must notify the district engineer by submitting a pre-construction notification (PCN) as early as possible. The district engineer must determine if the PCN is complete within 30 calendar days of the date of receipt and, if the PCN is determined to be incomplete, notify the prospective permittee within that 30 day period to request the additional information necessary to make the PCN complete. The request must specify the information needed to make the PCN complete. As a general rule, district engineers will request additional information necessary to make the PCN complete only once. However, if the

prospective permittee does not provide all of the requested information, then the district engineer will notify the prospective permittee that the PCN is still incomplete and the PCN review process will not commence until all of the requested information has been received by the district engineer. The prospective permittee shall not begin the activity until either:

(1) He or she is notified in writing by the district engineer that the activity may proceed under the NWP with any special conditions imposed by the district or division engineer; or

(2) 45 calendar days have passed from the district engineer's receipt of the complete PCN and the prospective permittee has not received written notice from the district or division engineer. However, if the permittee was required to notify the Corps pursuant to general condition 18 that listed species or critical habitat might be affected or are in the vicinity of the activity, or to notify the Corps pursuant to general condition 20 that the activity might have the potential to cause effects to historic properties, the permittee cannot begin the activity until receiving written notification from the Corps that there is "no effect" on listed species or "no potential to cause effects" on historic properties, or that any consultation required under Section 7 of the Endangered Species Act (see 33 CFR 330.4(f)) and/or section 106 of the National Historic Preservation Act (see 33 CFR 330.4(g)) has been completed. Also, work cannot begin under NWPs 21, 49, or 50 until the permittee has received written approval from the Corps. If the proposed activity requires a written waiver to exceed specified limits of an NWP, the permittee may not begin the activity until the district engineer issues the waiver. If the district or division engineer notifies the permittee in writing that an individual permit is required within 45 calendar days of receipt of a complete PCN, the permittee cannot begin the activity until an individual permit has been obtained. Subsequently, the permittee's right to proceed under the NWP may be modified, suspended, or revoked only in accordance with the procedure set forth in 33 CFR 330.5(d)(2).

(b) Contents of Pre-Construction Notification: The PCN must be in writing and include the following information:

(1) Name, address and telephone numbers of the prospective permittee;

(2) Location of the proposed activity;

(3) Identify the specific NWP or NWP(s) the prospective permittee wants to use to authorize the proposed activity;

(4) A description of the proposed activity; the activity's purpose; direct and indirect adverse environmental effects the activity would cause, including the anticipated amount of loss of wetlands, other special aquatic sites, and other waters expected to result from the NWP activity, in acres, linear feet, or other appropriate unit of measure; a description of any proposed mitigation measures intended to reduce the adverse environmental effects caused by the proposed activity; and any other NWP(s), regional general permit(s), or individual permit(s) used or intended to be used to authorize any part of the proposed project or any related activity, including other separate and distant crossings for linear projects that require Department of the Army authorization but do not require pre-construction notification. The description of the proposed activity and any proposed mitigation measures should be sufficiently detailed to allow the district engineer to determine that the adverse environmental effects of the activity will be no more than minimal and to determine the need for compensatory mitigation or other mitigation measures. For single and complete linear projects, the PCN must include the quantity of anticipated losses of wetlands, other special aquatic sites, and other waters for each single and complete crossing of those wetlands, other special aquatic sites, and other waters.

Sketches should be provided when necessary to show that the activity complies with the terms of the NWP. (Sketches usually clarify the activity and when provided results in a quicker decision. Sketches should contain sufficient detail to provide an illustrative description of the proposed activity (e.g., a conceptual plan), but do not need to be detailed engineering plans);

(5) The PCN must include a delineation of wetlands, other special aquatic sites, and other waters, such as lakes and ponds, and perennial, intermittent, and ephemeral streams, on the project site. Wetland delineations must be prepared in accordance with the current method required by the Corps. The permittee may ask the Corps to delineate the special aquatic sites and other waters on the project site, but there may be a delay if the Corps does the delineation, especially if the project site is large or contains many wetlands, other special aquatic sites, and other waters. Furthermore, the 45 day period will not start until the delineation has been submitted to or completed by the Corps, as appropriate;

(6) If the proposed activity will result in the loss of greater than 1/10-acre of wetlands and a PCN is required, the prospective permittee must submit a statement describing how the mitigation requirement will be satisfied, or explaining why the adverse environmental effects are no more than minimal and why compensatory mitigation should not be required. As an alternative, the prospective permittee may submit a conceptual or detailed mitigation plan.

(7) For non-Federal permittees, if any listed species or designated critical habitat might be affected or is in the vicinity of the activity, or if the activity is located in designated critical habitat, the PCN must include the name(s) of those endangered or threatened species that might be affected by the proposed activity or utilize the designated critical habitat that might be affected by the proposed activity. For NWP activities that require pre-construction notification, Federal permittees must provide documentation demonstrating compliance with the Endangered Species Act;

(8) For non-Federal permittees, if the NWP activity might have the potential to cause effects to a historic property listed on, determined to be eligible for listing on, or potentially eligible for listing on, the National Register of Historic Places, the PCN must state which historic property might have the potential to be affected by the proposed activity or include a vicinity map indicating the location of the historic property. For NWP activities that require pre-construction notification, Federal permittees must provide documentation demonstrating compliance with section 106 of the National Historic Preservation Act;

(9) For an activity that will occur in a component of the National Wild and Scenic River System, or in a river officially designated by Congress as a “study river” for possible inclusion in the system while the river is in an official study status, the PCN must identify the Wild and Scenic River or the “study river” (see general condition 16); and

(10) For an activity that requires permission from the Corps pursuant to 33 U.S.C. 408 because it will alter or temporarily or permanently occupy or use a U.S. Army Corps of Engineers federally authorized civil works project, the pre-construction notification must include a statement confirming that the project proponent has submitted a written request for section 408 permission from the Corps office having jurisdiction over that USACE project.

(c) Form of Pre-Construction Notification: The standard individual permit application form (Form ENG 4345) may be used, but the completed application form must clearly indicate that it is an NWP PCN and must include all of the applicable information required in paragraphs (b)(1) through (10) of this general condition. A letter containing the required information may also be used. Applicants may provide electronic files of PCNs and

supporting materials if the district engineer has established tools and procedures for electronic submittals.

(d) Agency Coordination: (1) The district engineer will consider any comments from Federal and state agencies concerning the proposed activity's compliance with the terms and conditions of the NWPs and the need for mitigation to reduce the activity's adverse environmental effects so that they are no more than minimal.

(2) Agency coordination is required for: (i) all NWP activities that require pre-construction notification and result in the loss of greater than 1/2-acre of waters of the United States; (ii) NWP 21, 29, 39, 40, 42, 43, 44, 50, 51, and 52 activities that require pre-construction notification and will result in the loss of greater than 300 linear feet of stream bed; (iii) NWP 13 activities in excess of 500 linear feet, fills greater than one cubic yard per running foot, or involve discharges of dredged or fill material into special aquatic sites; and (iv) NWP 54 activities in excess of 500 linear feet, or that extend into the waterbody more than 30 feet from the mean low water line in tidal waters or the ordinary high water mark in the Great Lakes.

(3) When agency coordination is required, the district engineer will immediately provide (e.g., via e-mail, facsimile transmission, overnight mail, or other expeditious manner) a copy of the complete PCN to the appropriate Federal or state offices (FWS, state natural resource or water quality agency, EPA, and, if appropriate, the NMFS). With the exception of NWP 37, these agencies will have 10 calendar days from the date the material is transmitted to notify the district engineer via telephone, facsimile transmission, or e-mail that they intend to provide substantive, site-specific comments. The comments must explain why the agency believes the adverse environmental effects will be more than minimal. If so contacted by an agency, the district engineer will wait an additional 15 calendar days before making a decision on the pre-construction notification. The district engineer will fully consider agency comments received within the specified time frame concerning the proposed activity's compliance with the terms and conditions of the NWPs, including the need for mitigation to ensure the net adverse environmental effects of the proposed activity are no more than minimal. The district engineer will provide no response to the resource agency, except as provided below. The district engineer will indicate in the administrative record associated with each pre-construction notification that the resource agencies' concerns were considered. For NWP 37, the emergency watershed protection and rehabilitation activity may proceed immediately in cases where there is an unacceptable hazard to life or a significant loss of property or economic hardship will occur. The district engineer will consider any comments received to decide whether the NWP 37 authorization should be modified, suspended, or revoked in accordance with the procedures at 33 CFR 330.5.

(4) In cases of where the prospective permittee is not a Federal agency, the district engineer will provide a response to NMFS within 30 calendar days of receipt of any Essential Fish Habitat conservation recommendations, as required by section 305(b)(4)(B) of the Magnuson-Stevens Fishery Conservation and Management Act.

(5) Applicants are encouraged to provide the Corps with either electronic files or multiple copies of pre-construction notifications to expedite agency coordination.

### **DISTRICT ENGINEER'S DECISION**

1. In reviewing the PCN for the proposed activity, the district engineer will determine whether the activity authorized by the NWP will result in more than minimal



individual or cumulative adverse environmental effects or may be contrary to the public interest. If a project proponent requests authorization by a specific NWP, the district engineer should issue the NWP verification for that activity if it meets the terms and conditions of that NWP, unless he or she determines, after considering mitigation, that the proposed activity will result in more than minimal individual and cumulative adverse effects on the aquatic environment and other aspects of the public interest and exercises discretionary authority to require an individual permit for the proposed activity. For a linear project, this determination will include an evaluation of the individual crossings of waters of the United States to determine whether they individually satisfy the terms and conditions of the NWP(s), as well as the cumulative effects caused by all of the crossings authorized by NWP. If an applicant requests a waiver of the 300 linear foot limit on impacts to streams or of an otherwise applicable limit, as provided for in NWPs 13, 21, 29, 36, 39, 40, 42, 43, 44, 50, 51, 52, or 54, the district engineer will only grant the waiver upon a written determination that the NWP activity will result in only minimal individual and cumulative adverse environmental effects. For those NWPs that have a waivable 300 linear foot limit for losses of intermittent and ephemeral stream bed and a 1/2-acre limit (i.e., NWPs 21, 29, 39, 40, 42, 43, 44, 50, 51, and 52), the loss of intermittent and ephemeral stream bed, plus any other losses of jurisdictional waters and wetlands, cannot exceed 1/2-acre.

2. When making minimal adverse environmental effects determinations the district engineer will consider the direct and indirect effects caused by the NWP activity. He or she will also consider the cumulative adverse environmental effects caused by activities authorized by NWP and whether those cumulative adverse environmental effects are no more than minimal. The district engineer will also consider site specific factors, such as the environmental setting in the vicinity of the NWP activity, the type of resource that will be affected by the NWP activity, the functions provided by the aquatic resources that will be affected by the NWP activity, the degree or magnitude to which the aquatic resources perform those functions, the extent that aquatic resource functions will be lost as a result of the NWP activity (e.g., partial or complete loss), the duration of the adverse effects (temporary or permanent), the importance of the aquatic resource functions to the region (e.g., watershed or ecoregion), and mitigation required by the district engineer. If an appropriate functional or condition assessment method is available and practicable to use, that assessment method may be used by the district engineer to assist in the minimal adverse environmental effects determination. The district engineer may add case-specific special conditions to the NWP authorization to address site-specific environmental concerns.

3. If the proposed activity requires a PCN and will result in a loss of greater than 1/10-acre of wetlands, the prospective permittee should submit a mitigation proposal with the PCN. Applicants may also propose compensatory mitigation for NWP activities with smaller impacts, or for impacts to other types of waters (e.g., streams). The district engineer will consider any proposed compensatory mitigation or other mitigation measures the applicant has included in the proposal in determining whether the net adverse environmental effects of the proposed activity are no more than minimal. The compensatory mitigation proposal may be either conceptual or detailed. If the district engineer determines that the activity complies with the terms and conditions of the NWP and that the adverse environmental effects are no more than minimal, after considering mitigation, the district engineer will notify the permittee and

include any activity-specific conditions in the NWP verification the district engineer deems necessary. Conditions for compensatory mitigation requirements must comply with the appropriate provisions at 33 CFR 332.3(k). The district engineer must approve the final mitigation plan before the permittee commences work in waters of the United States, unless the district engineer determines that prior approval of the final mitigation plan is not practicable or not necessary to ensure timely completion of the required compensatory mitigation. If the prospective permittee elects to submit a compensatory mitigation plan with the PCN, the district engineer will expeditiously review the proposed compensatory mitigation plan. The district engineer must review the proposed compensatory mitigation plan within 45 calendar days of receiving a complete PCN and determine whether the proposed mitigation would ensure the NWP activity results in no more than minimal adverse environmental effects. If the net adverse environmental effects of the NWP activity (after consideration of the mitigation proposal) are determined by the district engineer to be no more than minimal, the district engineer will provide a timely written response to the applicant. The response will state that the NWP activity can proceed under the terms and conditions of the NWP, including any activity-specific conditions added to the NWP authorization by the district engineer.

4. If the district engineer determines that the adverse environmental effects of the proposed activity are more than minimal, then the district engineer will notify the applicant either: (a) that the activity does not qualify for authorization under the NWP and instruct the applicant on the procedures to seek authorization under an individual permit; (b) that the activity is authorized under the NWP subject to the applicant's submission of a mitigation plan that would reduce the adverse environmental effects so that they are no more than minimal; or (c) that the activity is authorized under the NWP with specific modifications or conditions. Where the district engineer determines that mitigation is required to ensure no more than minimal adverse environmental effects, the activity will be authorized within the 45-day PCN period (unless additional time is required to comply with general conditions 18, 20, and/or 31, or to evaluate PCNs for activities authorized by NWPs 21, 49, and 50), with activity-specific conditions that state the mitigation requirements. The authorization will include the necessary conceptual or detailed mitigation plan or a requirement that the applicant submit a mitigation plan that would reduce the adverse environmental effects so that they are no more than minimal. When compensatory mitigation is required, no work in waters of the United States may occur until the district engineer has approved a specific mitigation plan or has determined that prior approval of a final mitigation plan is not practicable or not necessary to ensure timely completion of the required compensatory mitigation.

### **FURTHER INFORMATION**

1. District Engineers have authority to determine if an activity complies with the terms and conditions of an NWP.
2. NWPs do not obviate the need to obtain other federal, state, or local permits, approvals, or authorizations required by law.
3. NWPs do not grant any property rights or exclusive privileges.
4. NWPs do not authorize any injury to the property or rights of others.
5. NWPs do not authorize interference with any existing or proposed Federal project (see general condition 31).

## DEFINITIONS

Best management practices (BMPs): Policies, practices, procedures, or structures implemented to mitigate the adverse environmental effects on surface water quality resulting from development. BMPs are categorized as structural or non-structural.

Compensatory mitigation: The restoration (re-establishment or rehabilitation), establishment (creation), enhancement, and/or in certain circumstances preservation of aquatic resources for the purposes of offsetting unavoidable adverse impacts which remain after all appropriate and practicable avoidance and minimization has been achieved.

Currently serviceable: Useable as is or with some maintenance, but not so degraded as to essentially require reconstruction.

Direct effects: Effects that are caused by the activity and occur at the same time and place.

Discharge: The term “discharge” means any discharge of dredged or fill material into waters of the United States.

Ecological reference: A model used to plan and design an aquatic habitat and riparian area restoration, enhancement, or establishment activity under NWP 27. An ecological reference may be based on the structure, functions, and dynamics of an aquatic habitat type or a riparian area type that currently exists in the region where the proposed NWP 27 activity is located. Alternatively, an ecological reference may be based on a conceptual model for the aquatic habitat type or riparian area type to be restored, enhanced, or established as a result of the proposed NWP 27 activity. An ecological reference takes into account the range of variation of the aquatic habitat type or riparian area type in the region.

Enhancement: The manipulation of the physical, chemical, or biological characteristics of an aquatic resource to heighten, intensify, or improve a specific aquatic resource function(s). Enhancement results in the gain of selected aquatic resource function(s), but may also lead to a decline in other aquatic resource function(s). Enhancement does not result in a gain in aquatic resource area.

Ephemeral stream: An ephemeral stream has flowing water only during, and for a short duration after, precipitation events in a typical year. Ephemeral stream beds are located above the water table year-round. Groundwater is not a source of water for the stream. Runoff from rainfall is the primary source of water for stream flow.

Establishment (creation): The manipulation of the physical, chemical, or biological characteristics present to develop an aquatic resource that did not previously exist at an upland site. Establishment results in a gain in aquatic resource area.

High Tide Line: The line of intersection of the land with the water’s surface at the maximum height reached by a rising tide. The high tide line may be determined, in the absence of actual data, by a line of oil or scum along shore objects, a more or less continuous deposit of fine shell or debris on the foreshore or berm, other physical markings or characteristics, vegetation lines, tidal gages, or other suitable means that delineate the general height reached by a rising tide. The line encompasses spring high tides and other high tides that occur with periodic frequency but does not include storm surges in which there is a departure from the normal or predicted reach of the tide due to the piling up of water against a coast by strong winds such as those accompanying a hurricane or other intense storm.

Historic Property: Any prehistoric or historic district, site (including archaeological site), building, structure, or other object included in, or eligible for inclusion in, the National

Register of Historic Places maintained by the Secretary of the Interior. This term includes artifacts, records, and remains that are related to and located within such properties. The term includes properties of traditional religious and cultural importance to an Indian tribe or Native Hawaiian organization and that meet the National Register criteria (36 CFR part 60).

Independent utility: A test to determine what constitutes a single and complete non-linear project in the Corps Regulatory Program. A project is considered to have independent utility if it would be constructed absent the construction of other projects in the project area. Portions of a multi-phase project that depend upon other phases of the project do not have independent utility. Phases of a project that would be constructed even if the other phases were not built can be considered as separate single and complete projects with independent utility.

Indirect effects: Effects that are caused by the activity and are later in time or farther removed in distance, but are still reasonably foreseeable.

Intermittent stream: An intermittent stream has flowing water during certain times of the year, when groundwater provides water for stream flow. During dry periods, intermittent streams may not have flowing water. Runoff from rainfall is a supplemental source of water for stream flow.

Loss of waters of the United States: Waters of the United States that are permanently adversely affected by filling, flooding, excavation, or drainage because of the regulated activity. Permanent adverse effects include permanent discharges of dredged or fill material that change an aquatic area to dry land, increase the bottom elevation of a waterbody, or change the use of a waterbody. The acreage of loss of waters of the United States is a threshold measurement of the impact to jurisdictional waters for determining whether a project may qualify for an NWP; it is not a net threshold that is calculated after considering compensatory mitigation that may be used to offset losses of aquatic functions and services. The loss of stream bed includes the acres or linear feet of stream bed that are filled or excavated as a result of the regulated activity. Waters of the United States temporarily filled, flooded, excavated, or drained, but restored to pre-construction contours and elevations after construction, are not included in the measurement of loss of waters of the United States. Impacts resulting from activities that do not require Department of the Army authorization, such as activities eligible for exemptions under section 404(f) of the Clean Water Act, are not considered when calculating the loss of waters of the United States.

Navigable waters: Waters subject to section 10 of the Rivers and Harbors Act of 1899. These waters are defined at 33 CFR part 329.

Non-tidal wetland: A non-tidal wetland is a wetland that is not subject to the ebb and flow of tidal waters. Non-tidal wetlands contiguous to tidal waters are located landward of the high tide line (i.e., spring high tide line).

Open water: For purposes of the NWPs, an open water is any area that in a year with normal patterns of precipitation has water flowing or standing above ground to the extent that an ordinary high water mark can be determined. Aquatic vegetation within the area of flowing or standing water is either non-emergent, sparse, or absent. Vegetated shallows are considered to be open waters. Examples of "open waters" include rivers, streams, lakes, and ponds.

Ordinary High Water Mark: An ordinary high water mark is a line on the shore established by the fluctuations of water and indicated by physical characteristics, or by other appropriate means that consider the characteristics of the surrounding areas.

Perennial stream: A perennial stream has flowing water year-round during a typical year. The water table is located above the stream bed for most of the year. Groundwater is the

primary source of water for stream flow. Runoff from rainfall is a supplemental source of water for stream flow.

Practicable: Available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purposes.

Pre-construction notification: A request submitted by the project proponent to the Corps for confirmation that a particular activity is authorized by nationwide permit. The request may be a permit application, letter, or similar document that includes information about the proposed work and its anticipated environmental effects. Pre-construction notification may be required by the terms and conditions of a nationwide permit, or by regional conditions. A pre-construction notification may be voluntarily submitted in cases where pre-construction notification is not required and the project proponent wants confirmation that the activity is authorized by nationwide permit.

Preservation: The removal of a threat to, or preventing the decline of, aquatic resources by an action in or near those aquatic resources. This term includes activities commonly associated with the protection and maintenance of aquatic resources through the implementation of appropriate legal and physical mechanisms. Preservation does not result in a gain of aquatic resource area or functions.

Protected tribal resources: Those natural resources and properties of traditional or customary religious or cultural importance, either on or off Indian lands, retained by, or reserved by or for, Indian tribes through treaties, statutes, judicial decisions, or executive orders, including tribal trust resources.

Re-establishment: The manipulation of the physical, chemical, or biological characteristics of a site with the goal of returning natural/historic functions to a former aquatic resource. Re-establishment results in rebuilding a former aquatic resource and results in a gain in aquatic resource area and functions.

Rehabilitation: The manipulation of the physical, chemical, or biological characteristics of a site with the goal of repairing natural/historic functions to a degraded aquatic resource. Rehabilitation results in a gain in aquatic resource function, but does not result in a gain in aquatic resource area.

Restoration: The manipulation of the physical, chemical, or biological characteristics of a site with the goal of returning natural/historic functions to a former or degraded aquatic resource. For the purpose of tracking net gains in aquatic resource area, restoration is divided into two categories: re-establishment and rehabilitation.

Riffle and pool complex: Riffle and pool complexes are special aquatic sites under the 404(b)(1) Guidelines. Riffle and pool complexes sometimes characterize steep gradient sections of streams. Such stream sections are recognizable by their hydraulic characteristics. The rapid movement of water over a coarse substrate in riffles results in a rough flow, a turbulent surface, and high dissolved oxygen levels in the water. Pools are deeper areas associated with riffles. A slower stream velocity, a streaming flow, a smooth surface, and a finer substrate characterize pools.

Riparian areas: Riparian areas are lands next to streams, lakes, and estuarine- marine shorelines. Riparian areas are transitional between terrestrial and aquatic ecosystems, through which surface and subsurface hydrology connects riverine, lacustrine, estuarine, and marine waters with their adjacent wetlands, non-wetland waters, or uplands. Riparian areas provide a variety of ecological functions and services and help improve or maintain local water quality. (See general condition 23.)

Shellfish seeding: The placement of shellfish seed and/or suitable substrate to increase shellfish production. Shellfish seed consists of immature individual shellfish or individual shellfish attached to shells or shell fragments (i.e., spat on shell). Suitable substrate may consist of shellfish shells, shell fragments, or other appropriate materials placed into waters for shellfish habitat.

Single and complete linear project: A linear project is a project constructed for the purpose of getting people, goods, or services from a point of origin to a terminal point, which often involves multiple crossings of one or more waterbodies at separate and distant locations. The term “single and complete project” is defined as that portion of the total linear project proposed or accomplished by one owner/developer or partnership or other association of owners/developers that includes all crossings of a single water of the United States (i.e., a single waterbody) at a specific location. For linear projects crossing a single or multiple waterbodies several times at separate and distant locations, each crossing is considered a single and complete project for purposes of NWP authorization. However, individual channels in a braided stream or river, or individual arms of a large, irregularly shaped wetland or lake, etc., are not separate waterbodies, and crossings of such features cannot be considered separately.

Single and complete non-linear project: For non-linear projects, the term “single and complete project” is defined at 33 CFR 330.2(i) as the total project proposed or accomplished by one owner/developer or partnership or other association of owners/developers. A single and complete non-linear project must have independent utility (see definition of “independent utility”). Single and complete non-linear projects may not be “piecemealed” to avoid the limits in an NWP authorization.

Stormwater management: Stormwater management is the mechanism for controlling stormwater runoff for the purposes of reducing downstream erosion, water quality degradation, and flooding and mitigating the adverse effects of changes in land use on the aquatic environment.

Stormwater management facilities: Stormwater management facilities are those facilities, including but not limited to, stormwater retention and detention ponds and best management practices, which retain water for a period of time to control runoff and/or improve the quality (i.e., by reducing the concentration of nutrients, sediments, hazardous substances and other pollutants) of stormwater runoff.

Stream bed: The substrate of the stream channel between the ordinary high water marks. The substrate may be bedrock or inorganic particles that range in size from clay to boulders. Wetlands contiguous to the stream bed, but outside of the ordinary high water marks, are not considered part of the stream bed.

Stream channelization: The manipulation of a stream’s course, condition, capacity, or location that causes more than minimal interruption of normal stream processes. A channelized stream remains a water of the United States.

Structure: An object that is arranged in a definite pattern of organization. Examples of structures include, without limitation, any pier, boat dock, boat ramp, wharf, dolphin, weir, boom, breakwater, bulkhead, revetment, riprap, jetty, artificial island, artificial reef, permanent mooring structure, power transmission line, permanently moored floating vessel, piling, aid to navigation, or any other manmade obstacle or obstruction.

Tidal wetland: A tidal wetland is a jurisdictional wetland that is inundated by tidal waters. Tidal waters rise and fall in a predictable and measurable rhythm or cycle due to the gravitational pulls of the moon and sun. Tidal waters end where the rise and fall of the water

surface can no longer be practically measured in a predictable rhythm due to masking by other waters, wind, or other effects. Tidal wetlands are located channelward of the high tide line.

Tribal lands: Any lands title to which is either: 1) held in trust by the United States for the benefit of any Indian tribe or individual; or 2) held by any Indian tribe or individual subject to restrictions by the United States against alienation.

Tribal rights: Those rights legally accruing to a tribe or tribes by virtue of inherent sovereign authority, unextinguished aboriginal title, treaty, statute, judicial decisions, executive order or agreement, and that give rise to legally enforceable remedies.

Vegetated shallows: Vegetated shallows are special aquatic sites under the 404(b)(1) Guidelines. They are areas that are permanently inundated and under normal circumstances have rooted aquatic vegetation, such as seagrasses in marine and estuarine systems and a variety of vascular rooted plants in freshwater systems.

Waterbody: For purposes of the NWP, a waterbody is a jurisdictional water of the United States. If a wetland is adjacent to a waterbody determined to be a water of the United States, that waterbody and any adjacent wetlands are considered together as a single aquatic unit (see 33 CFR 328.4(c)(2)). Examples of “waterbodies” include streams, rivers, lakes, ponds, and wetlands.

## **FINAL REGIONAL CONDITIONS 2017**

### ***NOTICE ABOUT WEB LINKS IN THIS DOCUMENT:***

*The web links (both internal to our Wilmington District and any external links to collaborating agencies) in this document are valid at the time of publication. However, the Wilmington District Regulatory Program web page addresses, as with other agency web sites, may change over the timeframe of the five-year Nationwide Permit renewal cycle, in response to policy mandates or technology advances. While we will make every effort to check on the integrity of our web links and provide re-direct pages whenever possible, we ask that you report any broken links to us so we can keep the page information current and usable. We apologize in advanced for any broken links that you may encounter, and we ask that you navigate from the Regulatory home page (Regulatory Permit Program Wetlands and Streams) of the Wilmington District Corps of Engineers, to the “Permits” section of our web site to find links for pages that cannot be found by clicking directly on the listed web link in this document.*

### **Final 2017 Regional Conditions for Nationwide Permits (NWP) in the Wilmington District**

#### **1.0 Excluded Waters**

The Corps has identified waters that will be excluded from the use of all NWP's during certain timeframes. These waters are:

##### **1.1 Anadromous Fish Spawning Areas**

Waters of the United States identified by either the North Carolina Division of Marine Fisheries (NCDMF) or the North Carolina Wildlife Resources Commission (NCWRC) as anadromous fish spawning areas are excluded during the period between February 15 and June 30, without prior written approval from the Corps and either NCDMF or NCWRC.

##### **1.2 Trout Waters Moratorium**

Waters of the United States in the designated trout watersheds of North Carolina are excluded during the period between October 15 and April 15 without prior written approval from the NCWRC, or from the Eastern Band of Cherokee Indians (EBCI) Fisheries and Wildlife Management (FWM) office if the project is located on EBCI trust land. (See Section 2.7 for information on the designated trout watersheds).

##### **1.3 Sturgeon Spawning Areas as Designated by the National Marine Fisheries Service (NMFS)**

Waters of the United States designated as sturgeon spawning areas are excluded during the period between February 1 and June 30, without prior written approval from the NMFS.



## **2.0 Waters Requiring Additional Notification**

The Corps has identified waters that will be subject to additional notification requirements for activities authorized by all NWPs. These waters are:

### **2.1 Western NC Counties that Drain to Designated Critical Habitat**

For proposed activities within waters of the United States that require a Pre-Construction Notification (PCN) and are located in the sixteen counties listed below, permittees must provide a copy of the PCN to the U.S. Fish and Wildlife Service (USFWS), 160 Zillicoa Street, Asheville, North Carolina 28801. This PCN must be sent concurrently to the U.S. Fish and Wildlife Service and the Corps Asheville Regulatory Field Office. Please see General Condition 18 for specific notification requirements related to the Endangered Species Act and the below website for information on the location of designated critical habitat.

Counties with tributaries that drain to designated critical habitat that require notification to the Asheville U.S. Fish and Wildlife Service: Avery, Cherokee, Forsyth, Graham, Haywood, Henderson, Jackson, Macon, Mecklenburg, Mitchell, Stokes, Surry, Swain, Transylvania, Union and Yancey.

Website and office addresses for Endangered Species Act Information:

The Wilmington District has developed the following website for permittees which provides guidelines on how to review linked websites and maps in order to fulfill NWP General Condition 18 requirements:

<http://www.saw.usace.army.mil/Missions/RegulatoryPermitProgram/AgencyCoordination/ESA.asp>

Permittees who do not have internet access may contact the appropriate U.S. Fish and Wildlife Service offices listed below or Corps at (910) 251-4633:

Asheville U.S. Fish and Wildlife Service Office counties: All counties west of and including Anson, Stanly, Davidson, Forsythe and Stokes Counties.

U.S. Fish and Wildlife Service  
Asheville Field Office  
160 Zillicoa Street  
Asheville, NC 28801  
Telephone: (828) 258-3939

Raleigh U.S. Fish and Wildlife Service Office counties: all counties east of and including Richmond, Montgomery, Randolph, Guilford, and Rockingham Counties.

U.S. Fish and Wildlife Service  
Raleigh Field Office  
Post Office Box 33726

Raleigh, NC 27636-3726  
Telephone: (919) 856-4520

## **2.2 Special Designation Waters**

Prior to the use of any NWP, except NWP 3, that involves a discharge of dredged or fill material in any of the following identified waters and/or adjacent wetlands in North Carolina, permittees shall submit a PCN to the District Engineer prior to commencing the activity (see General Condition 32). The North Carolina waters and wetlands that require additional notification requirements are:

“Outstanding Resource Waters” (ORW) or “High Quality Waters” (HQW) as designated by the North Carolina Environmental Management Commission; “Primary Nursery Areas” (PNA), including inland PNA, as designated by the North Carolina Marine Fisheries Commission and the NCWRC; or wetlands adjacent to these waters. Definitions of ORW, HQW and PNA waters can be found in the North Carolina State Administrative Code, Title 15A, Subchapters 2B and 10C (15A NCAC 02B, 15A NCAC 10C) and at the following World Wide Web page: <http://reports.oah.state.nc.us/ncac.asp?folderName=\Title%2015A%20-%20Environmental%20Quality&lookupError=15A%20NCAC%20000%20>. Surface water classifications for waters in North Carolina can be viewed at the North Carolina Division of Water Resources website or at the following World Wide Web Page: <https://deq.nc.gov/about/divisions/water-resources/planning/classification-standards/classifications>

Permittees who do not have internet access may contact the Corps at (910) 251- 4633.

## **2.3 Coastal Area Management Act (CAMA) Areas of Environmental Concern**

Non-federal permittees for any NWP in a designated “Area of Environmental Concern” (AEC) in the twenty (20) counties of Eastern North Carolina covered by the North Carolina Coastal Area Management Act (CAMA) must also obtain the required CAMA permit. Development activities for non-federal projects may not commence until a copy of the approved CAMA permit is furnished to the appropriate Wilmington District Regulatory Field Office (Wilmington Field Office – 69 Darlington Avenue, Wilmington, NC 28403, (910) 251-4802 or Washington Field Office – 2407 West 5th Street, Washington, NC 27889, (910) 251-4610).

## **2.4 Barrier Islands**

Prior to the use of any NWP on a barrier island of North Carolina, permittees must submit a PCN to the District Engineer prior to commencing the activity (see General Condition 32).

## **2.5 Mountain or Piedmont Bogs**

Prior to the use of any NWP in a Bog, as classified by the North Carolina Wetland Assessment Methodology (NCWAM), permittees shall submit a PCN to the District Engineer prior to commencing the activity (see General Condition 32). The latest version of NCWAM can be

viewed on the Corps RIBITS (Regulatory In-lieu Fee and Bank Information Tracking System) website or at the following World Wide Web Page:  
[https://ribits.usace.army.mil/ribits\\_apex/f?p=107:27:0::NO::](https://ribits.usace.army.mil/ribits_apex/f?p=107:27:0::NO::)

## 2.6 Animal Waste Facilities

Prior to use of any NWP for construction of animal waste facilities in waters of the United States, including wetlands, permittees shall submit a PCN to the District Engineer prior to commencing the activity (see General Condition 32).

## 2.7 Trout Waters

Prior to any discharge of dredge or fill material into streams, waterbodies or wetlands within the 294 designated trout watersheds of North Carolina, the permittee shall submit a PCN (see General Condition 32) to the District Engineer prior to commencing the activity, unless other thresholds are established in the Regional Conditions in Section 4 (Additional Regional Conditions for Specific Nationwide Permits). The permittee shall also provide a copy of the notification to the appropriate NCWRC office, or to the EBCI FWM Office (if the project is located on EBCI trust land), to facilitate the determination of any potential impacts to designated Trout Waters.

Notification to the Corps will include a statement with the name of the NCWRC or EBCI FWM biologist contacted, the date of the notification, the location of work, a delineation of wetlands and waters, a discussion of alternatives to working in the mountain trout waters, why alternatives were not selected, and, if applicable, a plan to provide compensatory mitigation for all unavoidable adverse impacts to mountain trout waters.

NCWRC and NC Trout Watersheds:

<b>NCWRC Contact**</b>	<b>Counties that are entirely within Trout Watersheds*</b>	<b>Counties that are partially within Trout Watersheds*</b>
Mountain Coordinator Balsam Depot 20830 Great Smoky Mountain Expressway Waynesville, NC 28786 Telephone: (828) 558-6011  For NCDOT Projects:  NCDOT Coordinator 206 Charter. Street Albemarle, NC 28001 Telephone: (704) 982-9181	Alleghany    Jackson Ashe            Macon Avery            Swain Graham        Transylvania Haywood       Watauga	Burke            McDowell Buncombe      Mitchell Caldwell        Polk Cherokee       Rutherford Clay              Surry Henderson     Wilkes Madison         Yancey

\*NOTE: To determine notification requirements, contact the Corps Asheville Regulatory Field Office at (828) 271-7980 or view maps for each County at the following World Wide Web page: <http://www.saw.usace.army.mil/Missions/Regulatory-Permit-Program/Agency-Coordination/Trout/>.

\*\*If a project is located on EBCI trust land, submit the PCN in accordance with Section 3.14. Contact the Corps Asheville Regulatory Field Office at (828) 271-7980 with questions.

## **2.8 Western NC Waters and Corridors**

The permittee shall submit a PCN (see General Condition 32) to the District Engineer prior to commencing the activity in waters of the United States if the activity will occur within any of the following identified waters in western North Carolina, within 0.5 mile on either side of these waters, or within 0.75 mile of the Little Tennessee River, as measured from the top of the bank of the respective water (i.e., river, stream, or creek):

Brasstown Creek  
Burningtown Creek  
Cane River  
Caney Fork  
Cartoogechaye Creek  
Chattooga River  
Cheoah River  
Cowee Creek  
Cullasaja River  
Deep Creek  
Ellijay Creek  
French Broad River  
Garden Creek  
Hiwassee River  
Hominy Creek  
Iotla Creek  
Little Tennessee River (within the river or within 0.75 mile on either side of this river)  
Nantahala River  
Nolichucky River  
North Fork French Broad River  
North Toe River  
Nottley River  
Oconaluftee River (portion not located on trust/EBCI land)  
Peachtree Creek  
Shooting Creek  
Snowbird Creek  
South Toe River  
Stecoah Creek  
Swannanoa River  
Sweetwater Creek

Tuckasegee River (also spelled Tuckaseegee or Tuckaseigee)  
Valley River  
Watauga Creek  
Watauga River  
Wayah Creek  
West Fork French Broad River

To determine notification requirements, contact the Corps Asheville Regulatory Field Office at (828) 271-7980 or view maps for all corridors at the following World Wide Web page:  
<http://www.saw.usace.army.mil/Missions/Regulatory-Permit-Program/Agency-Coordination/Designated-Special-Waters.aspx>

### **3.0 List of Corps Regional Conditions for All Nationwide Permits**

The following conditions apply to all Nationwide Permits in the Wilmington District:

#### **3.1 Limitation of Loss of Stream Bed**

NWPs may not be used for activities that may result in the loss or degradation of more than 300 total linear feet of stream bed, unless the District Engineer has waived the 300 linear foot limit for ephemeral and intermittent streams on a case-by-case basis and has determined that the proposed activity will result in minimal individual and cumulative adverse impacts to the aquatic environment. Waivers for the loss of ephemeral and intermittent streams must be in writing and documented by appropriate/accepted stream quality assessments\*. This waiver only applies to the 300 linear feet threshold for NWPs.

This Regional Condition does not apply to NWP 23 (Approved Categorical Exclusions).

\*NOTE: Permittees should utilize the most current methodology prescribed by Wilmington District to assess stream function and quality. Information can be found at:  
[https://ribits.usace.army.mil/ribits\\_apex/f?p=107:27:0::NO::](https://ribits.usace.army.mil/ribits_apex/f?p=107:27:0::NO::)

#### **3.2 Mitigation for Loss of Stream Bed**

For any NWP that results in a loss of more than 150 linear feet of stream, the permittee shall provide a mitigation proposal to compensate for more than minimal individual and cumulative adverse impacts to the aquatic environment. For stream losses of 150 linear feet or less that require a PCN, the District Engineer may determine, on a case-by-case basis, that compensatory mitigation is required to ensure that the activity results in minimal adverse effect on the aquatic environment.

#### **3.3 Pre-construction Notification for Loss of Streambed Exceeding 150 Feet**

Prior to use of any NWP for any activity which impacts more than 150 total linear feet of perennial stream, intermittent or ephemeral stream, the permittee shall submit a PCN to the District Engineer prior to commencing the activity (see General Condition 32). This applies to

NWPs that do not have specific notification requirements. If a NWP has specific notification requirements, the requirements of the NWP should be followed.

### **3.4 Restriction on Use of Live Concrete**

For all NWPs which allow the use of concrete as a building material, live or fresh concrete, including bags of uncured concrete, may not come into contact with the water in or entering into waters of the United States. Water inside coffer dams or casings that has been in contact with wet concrete shall only be returned to waters of the United States after the concrete is set and cured and when it no longer poses a threat to aquatic organisms.

### **3.5 Requirements for Using Riprap for Bank Stabilization**

For all NWPs that allow for the use of riprap material for bank stabilization, the following measures shall be applied:

**3.5.1.** Where bank stabilization is conducted as part of an activity, natural design, bioengineering and/or geoenvironmental methods that incorporate natural durable materials, native seed mixes, and native plants and shrubs are to be utilized to the maximum extent practicable.

**3.5.2.** Filter cloth must be placed underneath the riprap as an additional requirement of its use in North Carolina waters. The placement of filter fabric is not required if the riprap will be pushed or “keyed” into the bank of the waterbody. A waiver from the specifications in this Regional Condition may be requested in writing. The waiver will only be issued if it can be demonstrated that the impacts of complying with this Regional Condition would result in greater adverse impacts to the aquatic environment.

**3.5.3.** The placement of riprap shall be limited to the areas depicted on submitted work plan drawings.

**3.5.4.** The riprap material shall be clean and free from loose dirt or any pollutant except in trace quantities that would not have an adverse environmental effect.

**3.5.5.** It shall be of a size sufficient to prevent its movement from the authorized alignment by natural forces under normal conditions.

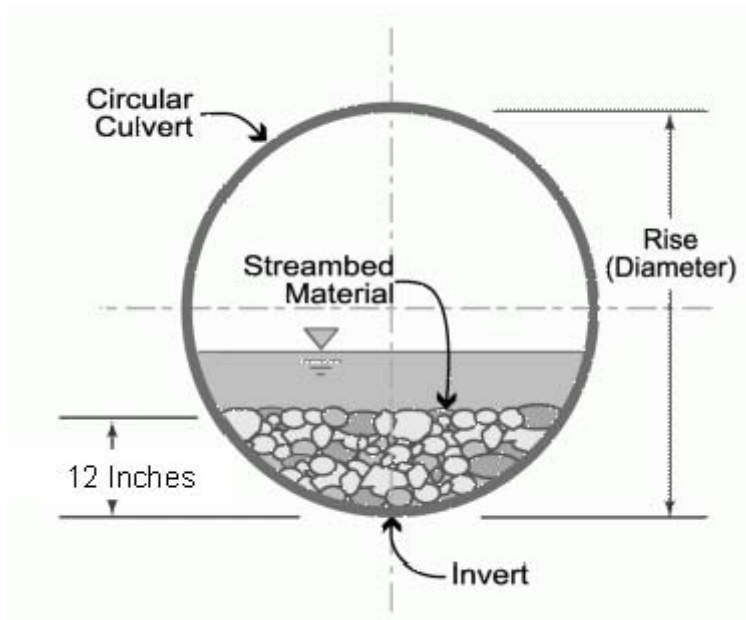
**3.5.6.** The riprap material shall consist of clean rock or masonry material such as, but not limited to, granite, marl, or broken concrete.

### **3.6 Requirements for Culvert Placement**

**3.6.1** For all NWPs that involve the construction/installation of culverts, measures will be included in the construction/installation that will promote the safe passage of fish and other aquatic organisms. The dimension, pattern, and profile of the stream above and below a pipe or culvert should not be modified by altering the width or depth of the stream profile in connection with the construction activity. The width, height, and gradient of a proposed culvert should be

sufficient to pass the average historical low flow and spring flow without adversely altering flow velocity. Spring flow is the seasonal sustained high flow that typically occurs in the spring. Spring flows should be determined from gage data, if available. In the absence of such data, bank-full flow can be used as a comparable indicator.

In Public Trust Areas of Environmental Concern (AEC) and/or the Estuarine Waters AEC as designated by the Coastal Area Management Act (CAMA): All pipes/culverts must be sufficiently sized to allow for the burial of the bottom of the culvert at least one foot below normal bed elevation.



In all other areas: Culverts greater than 48 inches in diameter will be buried at least one foot below the bed of the stream. Culverts 48 inches in diameter or less shall be buried to maintain aquatic passage and to maintain passage during drought or low flow conditions, and every effort shall be made to maintain the existing channel slope.

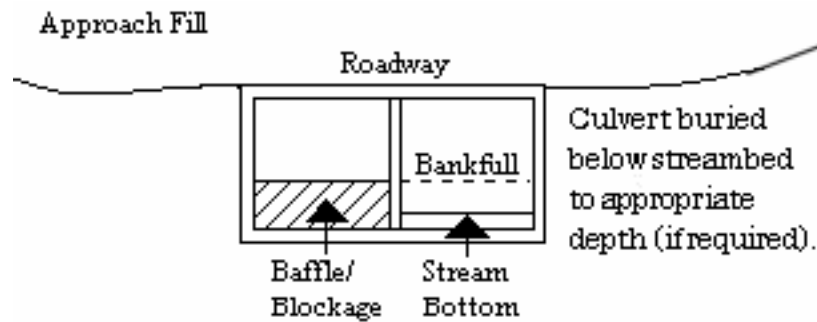
Culverts must be designed and constructed in a manner that minimizes destabilization and head cutting. Destabilizing the channel and head cutting upstream should be considered and appropriate actions incorporated in the design and placement of the culvert.

A waiver from the depth specifications in this condition may be requested, in writing, by the permittee and issued by the Corp; this request must be specific as to the reasons(s) for the request. The waiver will be issued if it can be demonstrated that the proposed design would result in less impacts to the aquatic environment.

All counties: Culverts placed within riparian and/or riverine wetlands must be installed in a manner that does not restrict the flow and circulation patterns of waters of the United States.

Culverts placed across wetland fills purely for the purposes of equalizing surface water do not have to be buried, but the culverts must be of adequate size and/or number to ensure unrestricted transmission of water.

**3.6.2** Bank-full flows (or less) shall be accommodated through maintenance of the existing bank-full channel cross sectional area. Additional culverts or culvert barrels at such crossings shall be allowed only to receive bank-full flows.



**3.6.3** Where adjacent floodplain is available, flows exceeding bank-full should be accommodated by installing culverts at the floodplain elevation. Additional culverts or culvert barrels at such crossings should not be buried, or if buried, must have sills at the inlets to ensure that they only receive flows exceeding bank-full.

**3.6.4** Excavation of existing stream channels shall be limited to the minimum necessary to construct or install the proposed culvert. The final width of the impacted stream at the culvert inlet and outlet should be no greater than the original stream width. A waiver from this condition may be requested in writing; this request must be specific as to the reason(s) for the request. The waiver will be issued if the proposed design would result in less impacts to the aquatic environment and/or if it can be demonstrated that it is not practicable to restore the final width of the impacted stream at the culvert inlet and outlet to the width of the original stream channel.

**3.6.5** The width of the culvert shall be comparable to the width of the stream channel. If the width of the culvert is wider than the stream channel, the culvert shall include baffles, benches and/or sills to maintain the width of the stream channel. A waiver from this condition may be requested in writing; this request must be specific as to the reason(s) for the request. The waiver will be issued if it can be demonstrated that it is not practicable or necessary to include baffles, benches or sills and the design would result in less impacts to the aquatic environment.

### **3.7 Notification to NCDEQ Shellfish Sanitation Section**

Permittees shall notify the NCDEQ Shellfish Sanitation Section prior to dredging in or removing sediment from an area closed to shell fishing where the effluent may be released to an area open for shell fishing or swimming in order to avoid contamination from the disposal area and cause a temporary shellfish closure to be made. Such notification shall also be provided to the appropriate Corps Regulatory Field Office. Any disposal of sand to the ocean beach should occur between November 1 and April 30 when recreational usage is low. Only clean sand



should be used and no dredged sand from closed shell fishing areas may be used. If beach disposal were to occur at times other than stated above or if sand from a closed shell fishing area is to be used, a swimming advisory shall be posted, and a press release shall be issued by the permittee.

### **3.8 Submerged Aquatic Vegetation**

Impacts to Submerged Aquatic Vegetation (SAV) are not authorized by any NWP, except NWP 48, unless EFH Consultation has been completed pursuant to the Magnuson-Stevens Fisheries Conservation and Management Act (Magnuson-Stevens Act). Permittees shall submit a PCN (See NWP General Condition 32) to the District Engineer prior to commencing the activity if the project would affect SAV. The permittee may not begin work until notified by the Corps that the requirements of the Magnuson-Stevens Act have been satisfied and that the activity is authorized.

### **3.9 Sedimentation and Erosion Control Structures and Measures**

All PCNs will identify and describe sedimentation and erosion control structures and measures proposed for placement in waters of the United States. The structures and measures should be depicted on maps, surveys or drawings showing location and impacts to jurisdictional wetlands and streams.

### **3.10 Restoration of Temporary Impacts to Stream Beds**

Upon completion of work that involves temporary stream impacts, streambeds are to be restored to pre-project elevations and widths using natural streambed material such that the impacted stream reach mimics the adjacent upstream and downstream reach. The impacted area shall be backfilled with natural streambed material to a depth of at least 12 inches or to the bottom depth of the impacted area if shallower than 12 inches. An engineered in-stream structure or material can be used to provide protection of a buried structure if it provides benefits to the aquatic environment and can be accomplished by a natural streambed design. A permittee may request a waiver of this condition if it is determined a buried structure needs significant physical protection beyond those provided in this condition. This condition does not apply to NWP 27 – Aquatic Habitat Restoration, Enhancement, and Establishment Activities.

### **3.11 Restoration of Temporary Impacts to Stream Banks**

Upon completion of work involving temporary stream bank impacts, stream banks are to be restored to pre-project grade and contours or beneficial grade and contours if the original bank slope is steep and unstable. Natural durable materials, native seed mixes, and native plants and shrubs are to be utilized in the restoration. Natural designs which use bioengineered and/or geo-engineered methods are to be applied. An engineered structure or material can be used to provide protection of a buried structure if it provides benefits to the stream bank environment, provided it is not in excess of the minimum amount needed for protection and does not exceed an average of one cubic yard per running foot placed along the bank below the plane of the ordinary high water mark. A permittee may request a waiver of this condition if it is determined a buried structure

needs significant physical protection beyond those provided in this condition. This condition does not apply to NWP 27 – Aquatic Habitat Restoration, Enhancement, and Establishment Activities.

### **3.12 Federal Navigation Channel Setbacks and Corps Easements**

**3.12.1** Authorized structures and fills located in or adjacent to Federally authorized waterways will be constructed in accordance with the latest setback criteria established by the Wilmington District Engineer. You may review the setback policy at <http://www.saw.usace.army.mil/Missions/Navigation/Setbacks.aspx>. This general permit does not authorize the construction of hardened or permanently fixed structures within the Federally Authorized Channel Setback, unless the activity is approved by the Corps. The permittee shall submit a PCN (see General Condition 32) to the District Engineer prior to the construction of any structures or fills within the Federally Authorized Channel Setback.

**3.12.2** The permittee shall obtain a Consent to Cross Government Easement from the Wilmington District’s Land Use Coordinator prior to any crossing of the Corps easement and/or prior to commencing construction of any structures, authorized dredging or other work within the right-of-way of, or in proximity to, a federally designated disposal area. The Land Use Coordinator may be contacted at: CESA-W-OP-N, 69 Darlington Avenue, Wilmington, North Carolina 28403-1343, email: [SAWWeb-NAV@usace.army.mil](mailto:SAWWeb-NAV@usace.army.mil)

### **3.13 Northern Long-eared Bat – Endangered Species Act Compliance**

The Wilmington District, U.S. Army Corps of Engineers has consulted with the United States Fish and Wildlife Service (USFWS) in regards to the threatened Northern long-eared bat (NLEB) (*Myotis septentrionalis*) and Standard Local Operating Procedures for Endangered Species (SLOPES) have been approved by the Corps and the USFWS. This condition concerns effects to the NLEB only and does not address effects to other federally listed species and/or federally designated critical habitat.

A. Procedures when the Corps is the lead federal\* agency for a project:

The permittee must comply with (1) and (2) below when:

- the project is located in the western 41 counties of North Carolina, to include non-federal aid North Carolina Department of Transportation (NCDOT) projects, OR;
- the project is located in the 59 eastern counties of North Carolina, and is a non-NCDOT project.

\*Generally, if a project is located on private property or on non-federal land, and the project is not being funded by a federal entity, the Corps will be the lead federal agency due to the requirement to obtain Department of the Army authorization to impact waters of the United States. If the project is located on federal land, contact the Corps to determine the lead federal agency.

(1) A permittee using a NWP must check to see if their project is located in the range of the NLEB by using the following website:

<http://www.fws.gov/midwest/endangered/mammals/nleb/pdf/WNSZone.pdf>. If the project is within the range of the NLEB, or if the project includes percussive activities (e.g., blasting, pile driving, etc.), the permittee is then required to check the appropriate website in the paragraph below to discover if their project:

- is located in a 12-digit Hydrologic Unit Code area (“red HUC” - shown as red areas on the map), AND/OR;
- involves percussive activities within 0.25 mile of a red HUC.

Red HUC maps - for the western 41 counties in NC (covered by the Asheville Ecological Services Field Office), check the project location against the electronic maps found at: [http://www.fws.gov/asheville/htmls/project\\_review/NLEB\\_in\\_WNC.html](http://www.fws.gov/asheville/htmls/project_review/NLEB_in_WNC.html). For the eastern 59 counties in NC (covered by the Raleigh Ecological Services Field Office), check the project location against the electronic maps found at:

[https://www.fws.gov/raleigh/NLEB\\_RFO.html](https://www.fws.gov/raleigh/NLEB_RFO.html).

(2) A permittee must submit a PCN to the District Engineer, and receive written authorization from the District Engineer, prior to commencing the activity, if the activity will involve any of the following:

- tree clearing/removal, construction/installation of wind turbines in a red HUC, AND/OR;
- bridge removal or maintenance, unless the bridge has been inspected and there is no evidence of bat use, (applies anywhere in the range of the NLEB), AND/OR;
- percussive activities in a red HUC, or within 0.25 mile of a red HUC.

The permittee may proceed with the activity without submitting a PCN to either the Corps or the USFWS, provided the activity complies with all applicable NWP terms and general and regional conditions, if the permittee’s review under A.(1) and A.(2) above shows that the project is:

- located outside of a red HUC (and there are no percussive activities), and the activity will NOT include bridge removal or maintenance, unless the bridge has been inspected and there is no evidence of bat use, OR;
- located outside of a red HUC and there are percussive activities, but the percussive activities will not occur within 0.25-mile of a red HUC boundary, and the activity will NOT include bridge removal or maintenance, unless the bridge has been inspected and there is no evidence of bat use, OR;

- located in a red HUC, but the activity will NOT include: tree clearing/removal; construction/installation of wind turbines; bridge removal or maintenance, unless the bridge has been inspected and there is no evidence of bat use, and/or; any percussive activities.

B. Procedures when the USACE is not the lead federal agency:

For projects where another federal agency is the lead federal agency - if that other federal agency has completed project-specific ESA Section 7(a)(2) consultation for the NLEB, and has (1) determined that the project would not cause prohibited incidental take of the NLEB, and (2) completed coordination/consultation that is required by the USFWS (per the directions on the respective USFWS office's website), that project may proceed without notification to either the USACE or the USFWS, provided all General and Regional Permit Conditions are met.

The NLEB SLOPES can be viewed on the USACE website at the following World Wide Web Page: <http://www.saw.usace.army.mil/Missions/Regulatory-Permit-Program/Agency-Coordination/ESA/>. Permittees who do not have internet access may contact the USACE at (910) 251- 4633.

### **3.14 Work on Eastern Band of Cherokee Indians Land**

All PCNs submitted for activities in waters of the United States on Eastern Band of Cherokee Indians (EBCI) trust land (i.e., Qualla Boundary and non-contiguous tracts of trust land), must comply with the requirements of the latest MOU between the Wilmington District and the Eastern Band of Cherokee Indians.

## **4.0 Additional Regional Conditions for Specific Nationwide Permits**

### **4.1 NWP #12 - Utility Line Activities**

**4.1.1** Pipeline/utility line construction through jurisdictional waters and wetlands will be accomplished utilizing directional drilling/boring methods to the maximum extent practicable.

**4.1.2** Temporary discharge of excavated or fill material into wetlands and waters of the United States will be for the absolute minimum period of time necessary to accomplish the work. Temporary discharges will be fully contained with appropriate erosion control or containment methods or otherwise such fills will consist of non-erodible materials.

**4.1.3** The work area authorized by this permit, including temporary and/or permanent fills, will be minimized to the greatest extent practicable. Justification for work corridors exceeding forty (40) feet in width is required and will be based on pipeline diameter and length, size of equipment required to construct the utility line, and other construction information deemed necessary to support the request. The permittee is required to provide this information to the Corps with the initial notification package.

**4.1.4** Excavated materials shall be returned to the excavated areas and any remaining materials shall be disposed of in uplands, unless the Corps authorizes disposal in waters of the United States.

**4.1.5** In areas where a sub-aqueous utility line is to cross a federally-maintained channel, (i.e., the Atlantic Intracoastal Waterway [AIWW]), the line will be buried at least six (6) feet below the allowable overdepth of the authorized channel, including all side slopes. For areas outside federally-maintained channels, sub-aqueous lines must be installed at a minimum depth of two (2) feet below the substrate when such lines might interfere with navigation.

**4.1.6** The minimum clearance\*(see NOTE in 4.1.7) for aerial communication lines, or any lines not transmitting electrical power, will be ten (10) feet above the clearance required for nearby stationary bridges as established by the U.S. Coast Guard. In the event the U.S. Coast Guard has not established a bridge clearance, minimum vertical clearances for power and aerial lines will not be less than required by Section 23, Rule 232, of the latest revision of the National Electrical Safety Code (ANSI C2). Clearances will not be less than shown in Table 232-1, Item 7, ANSI C2.

**4.1.7** The minimum clearance\* for an aerial line, transmitting electrical power, is based on the low point of the line under conditions that produce the greatest sag, taking into consideration temperature, load, wind, length or span and the type of supports. The minimum clearance for an aerial electrical power transmission line crossing navigable waters of the United States, where there is an established bridge clearance established by the U.S. Coast Guard, shall be governed by the system voltage, as indicated below:

Nominal System	Minimum Clearance
Voltage, kilovolt	Above Bridge Clearance (As Established by the U.S. Coast Guard)
115 and below	20 feet
138	22
161	24
230	26
350	30
500	35
700	42
750 to 765	45

\*NOTE: Minimum clearance is the distance measured between the lowest point of a stationary bridge, including any infrastructure attached to underside of the bridge, and the Mean High Water (MHW) of the navigable waters of the United States beneath the bridge.

**4.1.8** On navigable waters of the United States, including all federal navigation projects, where there is no bridge for reference for minimum clearance, the proposed project will need to be reviewed by the Corps in order to determine the minimum clearance between the line and MHW necessary to protect navigational interests.

**4.1.9** A plan to restore and re-vegetate wetland areas cleared for construction must be submitted with the required PCN. Cleared wetland areas shall be re-vegetated to the maximum extent practicable with native species of canopy, shrub, and herbaceous species. Fescue grass shall not be used.

**4.1.10** Any permanently maintained corridor along the utility right of way within forested wetlands shall be considered a permanent impact. A compensatory mitigation plan will be required for all such impacts associated with the requested activity if the activity requires PCN and the cumulative total of permanent forested wetland impacts exceeds 1/10-acre, unless the District Engineer determines in writing that either some other form of mitigation would be more environmentally appropriate or the adverse effects of the proposed activity are minimal.

For permanent forested wetland impacts of 1/10-acre or less, the District Engineer may determine, on a case-by-case basis, that compensatory mitigation is required to ensure that the activity results in minimal adverse effects on the aquatic environment.

**4.1.11** Use of rip-rap or any other engineered structures to stabilize a stream bed should be avoided to the maximum extent practicable. If riprap stabilization is needed, it should be placed only on the stream banks, or, if it is necessary to be placed in the stream bed, the finished top elevation of the riprap should not exceed that of the original stream bed.

**4.1.12** When directional boring or horizontal directional drilling (HDD) under waters of the United States, including wetlands, permittees shall closely monitor the project for hydraulic fracturing or “fracking.” Any discharge from hydraulic fracturing or “fracking” into waters of the United States, including wetlands, shall be reported to the appropriate Corps Regulatory Field Office within 48 hours. Restoration and/or compensatory mitigation may be required as a result of any unintended discharges.

**4.1.13** For purposes of this NWP, the term utility line does not include pipes or culverts associated with driveways, roadways, lots, etc.

**4.1.14** The permittee shall submit a PCN to the District Engineer prior to commencing the activity if the activity will involve the discharge of dredged or fill material into more than 1/10-acre of wetlands or 150 linear feet of stream channel for the construction of temporary access fills and/or temporary road crossings. The PCN must include a restoration plan that thoroughly describes how all temporary fills will be removed, describes how pre-project conditions will be restored, and includes a timetable for all restoration activities.

**NATIONWIDE PERMIT 13  
DEPARTMENT OF THE ARMY  
CORPS OF ENGINEERS  
FINAL NOTICE OF ISSUANCE AND MODIFICATION OF NATIONWIDE PERMITS  
FEDERAL REGISTER  
AUTHORIZED MARCH 19, 2017**

**Bank Stabilization.** Bank stabilization activities necessary for erosion control or prevention, such as vegetative stabilization, bioengineering, sills, rip rap, revetment, gabion baskets, stream barbs, and bulkheads, or combinations of bank stabilization techniques, provided the activity meets all of the following criteria:

- (a) No material is placed in excess of the minimum needed for erosion protection;
- (b) The activity is no more than 500 feet in length along the bank, unless the district engineer waives this criterion by making a written determination concluding that the discharge will result in no more than minimal adverse environmental effects (an exception is for bulkheads – the district engineer cannot issue a waiver for a bulkhead that is greater than 1,000 feet in length along the bank);
- (c) The activity will not exceed an average of one cubic yard per running foot, as measured along the length of the treated bank, below the plane of the ordinary high water mark or the high tide line, unless the district engineer waives this criterion by making a written determination concluding that the discharge will result in no more than minimal adverse environmental effects;
- (d) The activity does not involve discharges of dredged or fill material into special aquatic sites, unless the district engineer waives this criterion by making a written determination concluding that the discharge will result in no more than minimal adverse environmental effects;
- (e) No material is of a type, or is placed in any location, or in any manner, that will impair surface water flow into or out of any waters of the United States;
- (f) No material is placed in a manner that will be eroded by normal or expected high flows (properly anchored native trees and treetops may be used in low energy areas);
- (g) Native plants appropriate for current site conditions, including salinity, must be used for bioengineering or vegetative bank stabilization;
- (h) The activity is not a stream channelization activity; and
- (i) The activity must be properly maintained, which may require repairing it after severe storms or erosion events. This NWP authorizes those maintenance and repair activities if they require authorization.

This NWP also authorizes temporary structures, fills, and work, including the use of temporary mats, necessary to construct the bank stabilization activity. Appropriate measures must be taken to maintain normal downstream flows and minimize flooding to the maximum extent practicable, when temporary structures, work, and discharges, including cofferdams, are necessary for construction activities, access fills, or dewatering of construction sites. Temporary fills must consist of materials, and be placed in a manner, that will not be eroded by expected high flows. After construction, temporary fills must be removed in their entirety and the affected areas returned to pre-construction elevations. The areas affected by temporary fills must be revegetated, as appropriate.

**Notification:** The permittee must submit a pre-construction notification to the district engineer prior to commencing the activity if the bank stabilization activity: (1) involves discharges into special aquatic sites; or (2) is in excess of 500 feet in length; or (3) will involve the discharge of greater than an average of one cubic yard per running foot as measured along the length of the treated bank, below the plane of the ordinary high water mark or the high tide line. (See general condition 32.) (Authorities: Sections 10 and 404)



## NATIONWIDE PERMIT GENERAL CONDITIONS

The following General Conditions must be followed in order for any authorization by a NWP to be valid:

1. Navigation. (a) No activity may cause more than a minimal adverse effect on navigation.  
(b) Any safety lights and signals prescribed by the U.S. Coast Guard, through regulations or otherwise, must be installed and maintained at the permittee's expense on authorized facilities in navigable waters of the United States.  
(c) The permittee understands and agrees that, if future operations by the United States require the removal, relocation, or other alteration, of the structure or work herein authorized, or if, in the opinion of the Secretary of the Army or his authorized representative, said structure or work shall cause unreasonable obstruction to the free navigation of the navigable waters, the permittee will be required, upon due notice from the Corps of Engineers, to remove, relocate, or alter the structural work or obstructions caused thereby, without expense to the United States. No claim shall be made against the United States on account of any such removal or alteration.
  
2. Aquatic Life Movements. No activity may substantially disrupt the necessary life cycle movements of those species of aquatic life indigenous to the waterbody, including those species that normally migrate through the area, unless the activity's primary purpose is to impound water. All permanent and temporary crossings of waterbodies shall be suitably culverted, bridged, or otherwise designed and constructed to maintain low flows to sustain the movement of those aquatic species. If a bottomless culvert cannot be used, then the crossing should be designed and constructed to minimize adverse effects to aquatic life movements.
  
3. Spawning Areas. Activities in spawning areas during spawning seasons must be avoided to the maximum extent practicable. Activities that result in the physical destruction (e.g., through excavation, fill, or downstream smothering by substantial turbidity) of an important spawning area are not authorized.
  
4. Migratory Bird Breeding Areas. Activities in waters of the United States that serve as breeding areas for migratory birds must be avoided to the maximum extent practicable.
  
5. Shellfish Beds. No activity may occur in areas of concentrated shellfish populations, unless the activity is directly related to a shellfish harvesting activity authorized by NWPs 4 and 48, or is a shellfish seeding or habitat restoration activity authorized by NWP 27.
  
6. Suitable Material. No activity may use unsuitable material (e.g., trash, debris, car bodies, asphalt, etc.). Material used for construction or discharged must be free from toxic pollutants in toxic amounts (see section 307 of the Clean Water Act).

7. Water Supply Intakes. No activity may occur in the proximity of a public water supply intake, except where the activity is for the repair or improvement of public water supply intake structures or adjacent bank stabilization.

8. Adverse Effects From Impoundments. If the activity creates an impoundment of water, adverse effects to the aquatic system due to accelerating the passage of water, and/or restricting its flow must be minimized to the maximum extent practicable.

9. Management of Water Flows. To the maximum extent practicable, the pre-construction course, condition, capacity, and location of open waters must be maintained for each activity, including stream channelization, storm water management activities, and temporary and permanent road crossings, except as provided below. The activity must be constructed to withstand expected high flows. The activity must not restrict or impede the passage of normal or high flows, unless the primary purpose of the activity is to impound water or manage high flows. The activity may alter the pre-construction course, condition, capacity, and location of open waters if it benefits the aquatic environment (e.g., stream restoration or relocation activities).

10. Fills Within 100-Year Floodplains. The activity must comply with applicable FEMA-approved state or local floodplain management requirements.

11. Equipment. Heavy equipment working in wetlands or mudflats must be placed on mats, or other measures must be taken to minimize soil disturbance.

12. Soil Erosion and Sediment Controls. Appropriate soil erosion and sediment controls must be used and maintained in effective operating condition during construction, and all exposed soil and other fills, as well as any work below the ordinary high water mark or high tide line, must be permanently stabilized at the earliest practicable date. Permittees are encouraged to perform work within waters of the United States during periods of low-flow or no-flow, or during low tides.

13. Removal of Temporary Fills. Temporary fills must be removed in their entirety and the affected areas returned to pre-construction elevations. The affected areas must be revegetated, as appropriate.

14. Proper Maintenance. Any authorized structure or fill shall be properly maintained, including maintenance to ensure public safety and compliance with applicable NWP general conditions, as well as any activity-specific conditions added by the district engineer to an NWP authorization.

15. Single and Complete Project. The activity must be a single and complete project. The same NWP cannot be used more than once for the same single and complete project.

16. Wild and Scenic Rivers. (a) No NWP activity may occur in a component of the National Wild and Scenic River System, or in a river officially designated by Congress as a “study river” for possible inclusion in the system while the river is in an official study status,

unless the appropriate Federal agency with direct management responsibility for such river, has determined in writing that the proposed activity will not adversely affect the Wild and Scenic River designation or study status.

(b) If a proposed NWP activity will occur in a component of the National Wild and Scenic River System, or in a river officially designated by Congress as a “study river” for possible inclusion in the system while the river is in an official study status, the permittee must submit a pre-construction notification (see general condition 32). The district engineer will coordinate the PCN with the Federal agency with direct management responsibility for that river. The permittee shall not begin the NWP activity until notified by the district engineer that the Federal agency with direct management responsibility for that river has determined in writing that the proposed NWP activity will not adversely affect the Wild and Scenic River designation or study status.

(c) Information on Wild and Scenic Rivers may be obtained from the appropriate Federal land management agency responsible for the designated Wild and Scenic River or study river (e.g., National Park Service, U.S. Forest Service, Bureau of Land Management, U.S. Fish and Wildlife Service). Information on these rivers is also available at: <http://www.rivers.gov/>.

17. Tribal Rights. No NWP activity may cause more than minimal adverse effects on tribal rights (including treaty rights), protected tribal resources, or tribal lands.

18. Endangered Species. (a) No activity is authorized under any NWP which is likely to directly or indirectly jeopardize the continued existence of a threatened or endangered species or a species proposed for such designation, as identified under the Federal Endangered Species Act (ESA), or which will directly or indirectly destroy or adversely modify the critical habitat of such species. No activity is authorized under any NWP which “may affect” a listed species or critical habitat, unless ESA section 7 consultation addressing the effects of the proposed activity has been completed. Direct effects are the immediate effects on listed species and critical habitat caused by the NWP activity. Indirect effects are those effects on listed species and critical habitat that are caused by the NWP activity and are later in time, but still are reasonably certain to occur.

(b) Federal agencies should follow their own procedures for complying with the requirements of the ESA. If pre-construction notification is required for the proposed activity, the Federal permittee must provide the district engineer with the appropriate documentation to demonstrate compliance with those requirements. The district engineer will verify that the appropriate documentation has been submitted. If the appropriate documentation has not been submitted, additional ESA section 7 consultation may be necessary for the activity and the respective federal agency would be responsible for fulfilling its obligation under section 7 of the ESA.

(c) Non-federal permittees must submit a pre-construction notification to the district engineer if any listed species or designated critical habitat might be affected or is in the vicinity of the activity, or if the activity is located in designated critical habitat, and shall not begin work on the activity until notified by the district engineer that the requirements of the ESA have been satisfied and that the activity is authorized. For activities that might affect Federally-listed endangered or threatened species or designated critical habitat, the pre-construction notification must include the name(s) of the endangered or threatened species that

might be affected by the proposed activity or that utilize the designated critical habitat that might be affected by the proposed activity. The district engineer will determine whether the proposed activity “may affect” or will have “no effect” to listed species and designated critical habitat and will notify the non-Federal applicant of the Corps’ determination within 45 days of receipt of a complete pre-construction notification. In cases where the non-Federal applicant has identified listed species or critical habitat that might be affected or is in the vicinity of the activity, and has so notified the Corps, the applicant shall not begin work until the Corps has provided notification that the proposed activity will have “no effect” on listed species or critical habitat, or until ESA section 7 consultation has been completed. If the non-Federal applicant has not heard back from the Corps within 45 days, the applicant must still wait for notification from the Corps.

(d) As a result of formal or informal consultation with the FWS or NMFS the district engineer may add species-specific permit conditions to the NWP.

(e) Authorization of an activity by an NWP does not authorize the “take” of a threatened or endangered species as defined under the ESA. In the absence of separate authorization (e.g., an ESA Section 10 Permit, a Biological Opinion with “incidental take” provisions, etc.) from the FWS or the NMFS, the Endangered Species Act prohibits any person subject to the jurisdiction of the United States to take a listed species, where “take” means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. The word “harm” in the definition of “take” means an act which actually kills or injures wildlife. Such an act may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering.

(f) If the non-federal permittee has a valid ESA section 10(a)(1)(B) incidental take permit with an approved Habitat Conservation Plan for a project or a group of projects that includes the proposed NWP activity, the non-federal applicant should provide a copy of that ESA section 10(a)(1)(B) permit with the PCN required by paragraph (c) of this general condition. The district engineer will coordinate with the agency that issued the ESA section 10(a)(1)(B) permit to determine whether the proposed NWP activity and the associated incidental take were considered in the internal ESA section 7 consultation conducted for the ESA section 10(a)(1)(B) permit. If that coordination results in concurrence from the agency that the proposed NWP activity and the associated incidental take were considered in the internal ESA section 7 consultation for the ESA section 10(a)(1)(B) permit, the district engineer does not need to conduct a separate ESA section 7 consultation for the proposed NWP activity. The district engineer will notify the non-federal applicant within 45 days of receipt of a complete pre-construction notification whether the ESA section 10(a)(1)(B) permit covers the proposed NWP activity or whether additional ESA section 7 consultation is required.

(g) Information on the location of threatened and endangered species and their critical habitat can be obtained directly from the offices of the FWS and NMFS or their world wide web pages at <http://www.fws.gov/> or <http://www.fws.gov/ipac> and <http://www.nmfs.noaa.gov/pr/species/esa/> respectively.

19. Migratory Birds and Bald and Golden Eagles. The permittee is responsible for ensuring their action complies with the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act. The permittee is responsible for contacting appropriate local office of the U.S. Fish and Wildlife Service to determine applicable measures to reduce impacts to migratory

birds or eagles, including whether “incidental take” permits are necessary and available under the Migratory Bird Treaty Act or Bald and Golden Eagle Protection Act for a particular activity.

20. Historic Properties. (a) In cases where the district engineer determines that the activity may have the potential to cause effects to properties listed, or eligible for listing, in the National Register of Historic Places, the activity is not authorized, until the requirements of Section 106 of the National Historic Preservation Act (NHPA) have been satisfied.

(b) Federal permittees should follow their own procedures for complying with the requirements of section 106 of the National Historic Preservation Act. If pre-construction notification is required for the proposed NWP activity, the Federal permittee must provide the district engineer with the appropriate documentation to demonstrate compliance with those requirements. The district engineer will verify that the appropriate documentation has been submitted. If the appropriate documentation is not submitted, then additional consultation under section 106 may be necessary. The respective federal agency is responsible for fulfilling its obligation to comply with section 106.

(c) Non-federal permittees must submit a pre-construction notification to the district engineer if the NWP activity might have the potential to cause effects to any historic properties listed on, determined to be eligible for listing on, or potentially eligible for listing on the National Register of Historic Places, including previously unidentified properties. For such activities, the pre-construction notification must state which historic properties might have the potential to be affected by the proposed NWP activity or include a vicinity map indicating the location of the historic properties or the potential for the presence of historic properties. Assistance regarding information on the location of, or potential for, the presence of historic properties can be sought from the State Historic Preservation Officer, Tribal Historic Preservation Officer, or designated tribal representative, as appropriate, and the National Register of Historic Places (see 33 CFR 330.4(g)). When reviewing pre-construction notifications, district engineers will comply with the current procedures for addressing the requirements of section 106 of the National Historic Preservation Act. The district engineer shall make a reasonable and good faith effort to carry out appropriate identification efforts, which may include background research, consultation, oral history interviews, sample field investigation, and field survey. Based on the information submitted in the PCN and these identification efforts, the district engineer shall determine whether the proposed NWP activity has the potential to cause effects on the historic properties. Section 106 consultation is not required when the district engineer determines that the activity does not have the potential to cause effects on historic properties (see 36 CFR 800.3(a)). Section 106 consultation is required when the district engineer determines that the activity has the potential to cause effects on historic properties. The district engineer will conduct consultation with consulting parties identified under 36 CFR 800.2(c) when he or she makes any of the following effect determinations for the purposes of section 106 of the NHPA: no historic properties affected, no adverse effect, or adverse effect. Where the non-Federal applicant has identified historic properties on which the activity might have the potential to cause effects and so notified the Corps, the non-Federal applicant shall not begin the activity until notified by the district engineer either that the activity has no potential to cause effects to historic properties or that NHPA section 106 consultation has been completed.

(d) For non-federal permittees, the district engineer will notify the prospective permittee within 45 days of receipt of a complete pre-construction notification whether NHPA section 106 consultation is required. If NHPA section 106 consultation is required, the district engineer will notify the non-Federal applicant that he or she cannot begin the activity until section 106 consultation is completed. If the non-Federal applicant has not heard back from the Corps within 45 days, the applicant must still wait for notification from the Corps.

(e) Prospective permittees should be aware that section 110k of the NHPA (54 U.S.C. 306113) prevents the Corps from granting a permit or other assistance to an applicant who, with intent to avoid the requirements of section 106 of the NHPA, has intentionally significantly adversely affected a historic property to which the permit would relate, or having legal power to prevent it, allowed such significant adverse effect to occur, unless the Corps, after consultation with the Advisory Council on Historic Preservation (ACHP), determines that circumstances justify granting such assistance despite the adverse effect created or permitted by the applicant. If circumstances justify granting the assistance, the Corps is required to notify the ACHP and provide documentation specifying the circumstances, the degree of damage to the integrity of any historic properties affected, and proposed mitigation. This documentation must include any views obtained from the applicant, SHPO/THPO, appropriate Indian tribes if the undertaking occurs on or affects historic properties on tribal lands or affects properties of interest to those tribes, and other parties known to have a legitimate interest in the impacts to the permitted activity on historic properties.

21. Discovery of Previously Unknown Remains and Artifacts. If you discover any previously unknown historic, cultural or archeological remains and artifacts while accomplishing the activity authorized by this permit, you must immediately notify the district engineer of what you have found, and to the maximum extent practicable, avoid construction activities that may affect the remains and artifacts until the required coordination has been completed. The district engineer will initiate the Federal, Tribal, and state coordination required to determine if the items or remains warrant a recovery effort or if the site is eligible for listing in the National Register of Historic Places.

22. Designated Critical Resource Waters. Critical resource waters include, NOAA-managed marine sanctuaries and marine monuments, and National Estuarine Research Reserves. The district engineer may designate, after notice and opportunity for public comment, additional waters officially designated by a state as having particular environmental or ecological significance, such as outstanding national resource waters or state natural heritage sites. The district engineer may also designate additional critical resource waters after notice and opportunity for public comment.

(a) Discharges of dredged or fill material into waters of the United States are not authorized by NWPs 7, 12, 14, 16, 17, 21, 29, 31, 35, 39, 40, 42, 43, 44, 49, 50, 51, and 52 for any activity within, or directly affecting, critical resource waters, including wetlands adjacent to such waters.

(b) For NWPs 3, 8, 10, 13, 15, 18, 19, 22, 23, 25, 27, 28, 30, 33, 34, 36, 37, 38, and 54, notification is required in accordance with general condition 32, for any activity proposed in the designated critical resource waters including wetlands adjacent to those waters. The district engineer may authorize activities under these NWPs only after it is determined that the impacts to the critical resource waters will be no more than minimal.

23. Mitigation. The district engineer will consider the following factors when determining appropriate and practicable mitigation necessary to ensure that the individual and cumulative adverse environmental effects are no more than minimal:

(a) The activity must be designed and constructed to avoid and minimize adverse effects, both temporary and permanent, to waters of the United States to the maximum extent practicable at the project site (i.e., on site).

(b) Mitigation in all its forms (avoiding, minimizing, rectifying, reducing, or compensating for resource losses) will be required to the extent necessary to ensure that the individual and cumulative adverse environmental effects are no more than minimal.

(c) Compensatory mitigation at a minimum one-for-one ratio will be required for all wetland losses that exceed 1/10-acre and require pre-construction notification, unless the district engineer determines in writing that either some other form of mitigation would be more environmentally appropriate or the adverse environmental effects of the proposed activity are no more than minimal, and provides an activity-specific waiver of this requirement. For wetland losses of 1/10-acre or less that require pre-construction notification, the district engineer may determine on a case-by-case basis that compensatory mitigation is required to ensure that the activity results in only minimal adverse environmental effects.

(d) For losses of streams or other open waters that require pre-construction notification, the district engineer may require compensatory mitigation to ensure that the activity results in no more than minimal adverse environmental effects. Compensatory mitigation for losses of streams should be provided, if practicable, through stream rehabilitation, enhancement, or preservation, since streams are difficult-to-replace resources (see 33 CFR 332.3(e)(3)).

(e) Compensatory mitigation plans for NWP activities in or near streams or other open waters will normally include a requirement for the restoration or enhancement, maintenance, and legal protection (e.g., conservation easements) of riparian areas next to open waters. In some cases, the restoration or maintenance/protection of riparian areas may be the only compensatory mitigation required. Restored riparian areas should consist of native species. The width of the required riparian area will address documented water quality or aquatic habitat loss concerns. Normally, the riparian area will be 25 to 50 feet wide on each side of the stream, but the district engineer may require slightly wider riparian areas to address documented water quality or habitat loss concerns. If it is not possible to restore or maintain/protect a riparian area on both sides of a stream, or if the waterbody is a lake or coastal waters, then restoring or maintaining/protecting a riparian area along a single bank or shoreline may be sufficient. Where both wetlands and open waters exist on the project site, the district engineer will determine the appropriate compensatory mitigation (e.g., riparian areas and/or wetlands compensation) based on what is best for the aquatic environment on a watershed basis. In cases where riparian areas are determined to be the most appropriate form of minimization or compensatory mitigation, the district engineer may waive or reduce the requirement to provide wetland compensatory mitigation for wetland losses.

(f) Compensatory mitigation projects provided to offset losses of aquatic resources must comply with the applicable provisions of 33 CFR part 332.

(1) The prospective permittee is responsible for proposing an appropriate compensatory mitigation option if compensatory mitigation is necessary to ensure that the activity results in no more than minimal adverse environmental effects. For the NWPs, the preferred mechanism for providing compensatory mitigation is mitigation bank credits or in-

lieu fee program credits (see 33 CFR 332.3(b)(2) and (3)). However, if an appropriate number and type of mitigation bank or in-lieu credits are not available at the time the PCN is submitted to the district engineer, the district engineer may approve the use of permittee-responsible mitigation.

(2) The amount of compensatory mitigation required by the district engineer must be sufficient to ensure that the authorized activity results in no more than minimal individual and cumulative adverse environmental effects (see 33 CFR 330.1(e)(3)). (See also 33 CFR 332.3(f)).

(3) Since the likelihood of success is greater and the impacts to potentially valuable uplands are reduced, aquatic resource restoration should be the first compensatory mitigation option considered for permittee-responsible mitigation.

(4) If permittee-responsible mitigation is the proposed option, the prospective permittee is responsible for submitting a mitigation plan. A conceptual or detailed mitigation plan may be used by the district engineer to make the decision on the NWP verification request, but a final mitigation plan that addresses the applicable requirements of 33 CFR 332.4(c)(2) through (14) must be approved by the district engineer before the permittee begins work in waters of the United States, unless the district engineer determines that prior approval of the final mitigation plan is not practicable or not necessary to ensure timely completion of the required compensatory mitigation (see 33 CFR 332.3(k)(3)).

(5) If mitigation bank or in-lieu fee program credits are the proposed option, the mitigation plan only needs to address the baseline conditions at the impact site and the number of credits to be provided.

(6) Compensatory mitigation requirements (e.g., resource type and amount to be provided as compensatory mitigation, site protection, ecological performance standards, monitoring requirements) may be addressed through conditions added to the NWP authorization, instead of components of a compensatory mitigation plan (see 33 CFR 332.4(c)(1)(ii)).

(g) Compensatory mitigation will not be used to increase the acreage losses allowed by the acreage limits of the NWPs. For example, if an NWP has an acreage limit of 1/2-acre, it cannot be used to authorize any NWP activity resulting in the loss of greater than 1/2-acre of waters of the United States, even if compensatory mitigation is provided that replaces or restores some of the lost waters. However, compensatory mitigation can and should be used, as necessary, to ensure that an NWP activity already meeting the established acreage limits also satisfies the no more than minimal impact requirement for the NWPs.

(h) Permittees may propose the use of mitigation banks, in-lieu fee programs, or permittee-responsible mitigation. When developing a compensatory mitigation proposal, the permittee must consider appropriate and practicable options consistent with the framework at 33 CFR 332.3(b). For activities resulting in the loss of marine or estuarine resources, permittee-responsible mitigation may be environmentally preferable if there are no mitigation banks or in-lieu fee programs in the area that have marine or estuarine credits available for sale or transfer to the permittee. For permittee-responsible mitigation, the special conditions of the NWP verification must clearly indicate the party or parties responsible for the implementation and performance of the compensatory mitigation project, and, if required, its long-term management.

(i) Where certain functions and services of waters of the United States are permanently adversely affected by a regulated activity, such as discharges of dredged or fill



material into waters of the United States that will convert a forested or scrub-shrub wetland to a herbaceous wetland in a permanently maintained utility line right-of-way, mitigation may be required to reduce the adverse environmental effects of the activity to the no more than minimal level.

24. Safety of Impoundment Structures. To ensure that all impoundment structures are safely designed, the district engineer may require non-Federal applicants to demonstrate that the structures comply with established state dam safety criteria or have been designed by qualified persons. The district engineer may also require documentation that the design has been independently reviewed by similarly qualified persons, and appropriate modifications made to ensure safety.

25. Water Quality. Where States and authorized Tribes, or EPA where applicable, have not previously certified compliance of an NWP with CWA section 401, individual 401 Water Quality Certification must be obtained or waived (see 33 CFR 330.4(c)). The district engineer or State or Tribe may require additional water quality management measures to ensure that the authorized activity does not result in more than minimal degradation of water quality.

26. Coastal Zone Management. In coastal states where an NWP has not previously received a state coastal zone management consistency concurrence, an individual state coastal zone management consistency concurrence must be obtained, or a presumption of concurrence must occur (see 33 CFR 330.4(d)). The district engineer or a State may require additional measures to ensure that the authorized activity is consistent with state coastal zone management requirements.

27. Regional and Case-By-Case Conditions. The activity must comply with any regional conditions that may have been added by the Division Engineer (see 33 CFR 330.4(e)) and with any case specific conditions added by the Corps or by the state, Indian Tribe, or U.S. EPA in its section 401 Water Quality Certification, or by the state in its Coastal Zone Management Act consistency determination.

28. Use of Multiple Nationwide Permits. The use of more than one NWP for a single and complete project is prohibited, except when the acreage loss of waters of the United States authorized by the NWPs does not exceed the acreage limit of the NWP with the highest specified acreage limit. For example, if a road crossing over tidal waters is constructed under NWP 14, with associated bank stabilization authorized by NWP 13, the maximum acreage loss of waters of the United States for the total project cannot exceed 1/3-acre.

29. Transfer of Nationwide Permit Verifications. If the permittee sells the property associated with a nationwide permit verification, the permittee may transfer the nationwide permit verification to the new owner by submitting a letter to the appropriate Corps district office to validate the transfer. A copy of the nationwide permit verification must be attached to the letter, and the letter must contain the following statement and signature:  
“When the structures or work authorized by this nationwide permit are still in existence at the time the property is transferred, the terms and conditions of this nationwide permit, including any special conditions, will continue to be binding on the new owner(s) of the property. To

validate the transfer of this nationwide permit and the associated liabilities associated with compliance with its terms and conditions, have the transferee sign and date below.”

\_\_\_\_\_  
(Transferee)

\_\_\_\_\_  
(Date)

30. Compliance Certification. Each permittee who receives an NWP verification letter from the Corps must provide a signed certification documenting completion of the authorized activity and implementation of any required compensatory mitigation. The success of any required permittee-responsible mitigation, including the achievement of ecological performance standards, will be addressed separately by the district engineer. The Corps will provide the permittee the certification document with the NWP verification letter. The certification document will include:

(a) A statement that the authorized activity was done in accordance with the NWP authorization, including any general, regional, or activity-specific conditions;

(b) A statement that the implementation of any required compensatory mitigation was completed in accordance with the permit conditions. If credits from a mitigation bank or in-lieu fee program are used to satisfy the compensatory mitigation requirements, the certification must include the documentation required by 33 CFR 332.3(l)(3) to confirm that the permittee secured the appropriate number and resource type of credits; and

(c) The signature of the permittee certifying the completion of the activity and mitigation.

The completed certification document must be submitted to the district engineer within 30 days of completion of the authorized activity or the implementation of any required compensatory mitigation, whichever occurs later.

31. Activities Affecting Structures or Works Built by the United States. If an NWP activity also requires permission from the Corps pursuant to 33 U.S.C. 408 because it will alter or temporarily or permanently occupy or use a U.S. Army Corps of Engineers (USACE) federally authorized Civil Works project (a “USACE project”), the prospective permittee must submit a pre-construction notification. See paragraph (b)(10) of general condition 32. An activity that requires section 408 permission is not authorized by NWP until the appropriate Corps office issues the section 408 permission to alter, occupy, or use the USACE project, and the district engineer issues a written NWP verification.

32. Pre-Construction Notification. (a) Timing. Where required by the terms of the NWP, the prospective permittee must notify the district engineer by submitting a pre-construction notification (PCN) as early as possible. The district engineer must determine if the PCN is complete within 30 calendar days of the date of receipt and, if the PCN is determined to be incomplete, notify the prospective permittee within that 30 day period to request the additional information necessary to make the PCN complete. The request must specify the information needed to make the PCN complete. As a general rule, district engineers will request additional information necessary to make the PCN complete only once. However, if the

prospective permittee does not provide all of the requested information, then the district engineer will notify the prospective permittee that the PCN is still incomplete and the PCN review process will not commence until all of the requested information has been received by the district engineer. The prospective permittee shall not begin the activity until either:

(1) He or she is notified in writing by the district engineer that the activity may proceed under the NWP with any special conditions imposed by the district or division engineer; or

(2) 45 calendar days have passed from the district engineer's receipt of the complete PCN and the prospective permittee has not received written notice from the district or division engineer. However, if the permittee was required to notify the Corps pursuant to general condition 18 that listed species or critical habitat might be affected or are in the vicinity of the activity, or to notify the Corps pursuant to general condition 20 that the activity might have the potential to cause effects to historic properties, the permittee cannot begin the activity until receiving written notification from the Corps that there is "no effect" on listed species or "no potential to cause effects" on historic properties, or that any consultation required under Section 7 of the Endangered Species Act (see 33 CFR 330.4(f)) and/or section 106 of the National Historic Preservation Act (see 33 CFR 330.4(g)) has been completed. Also, work cannot begin under NWPs 21, 49, or 50 until the permittee has received written approval from the Corps. If the proposed activity requires a written waiver to exceed specified limits of an NWP, the permittee may not begin the activity until the district engineer issues the waiver. If the district or division engineer notifies the permittee in writing that an individual permit is required within 45 calendar days of receipt of a complete PCN, the permittee cannot begin the activity until an individual permit has been obtained. Subsequently, the permittee's right to proceed under the NWP may be modified, suspended, or revoked only in accordance with the procedure set forth in 33 CFR 330.5(d)(2).

(b) Contents of Pre-Construction Notification: The PCN must be in writing and include the following information:

(1) Name, address and telephone numbers of the prospective permittee;

(2) Location of the proposed activity;

(3) Identify the specific NWP or NWP(s) the prospective permittee wants to use to authorize the proposed activity;

(4) A description of the proposed activity; the activity's purpose; direct and indirect adverse environmental effects the activity would cause, including the anticipated amount of loss of wetlands, other special aquatic sites, and other waters expected to result from the NWP activity, in acres, linear feet, or other appropriate unit of measure; a description of any proposed mitigation measures intended to reduce the adverse environmental effects caused by the proposed activity; and any other NWP(s), regional general permit(s), or individual permit(s) used or intended to be used to authorize any part of the proposed project or any related activity, including other separate and distant crossings for linear projects that require Department of the Army authorization but do not require pre-construction notification. The description of the proposed activity and any proposed mitigation measures should be sufficiently detailed to allow the district engineer to determine that the adverse environmental effects of the activity will be no more than minimal and to determine the need for compensatory mitigation or other mitigation measures. For single and complete linear projects, the PCN must include the quantity of anticipated losses of wetlands, other special aquatic sites, and other waters for each single and complete crossing of those wetlands, other special aquatic sites, and other waters.

Sketches should be provided when necessary to show that the activity complies with the terms of the NWP. (Sketches usually clarify the activity and when provided results in a quicker decision. Sketches should contain sufficient detail to provide an illustrative description of the proposed activity (e.g., a conceptual plan), but do not need to be detailed engineering plans);

(5) The PCN must include a delineation of wetlands, other special aquatic sites, and other waters, such as lakes and ponds, and perennial, intermittent, and ephemeral streams, on the project site. Wetland delineations must be prepared in accordance with the current method required by the Corps. The permittee may ask the Corps to delineate the special aquatic sites and other waters on the project site, but there may be a delay if the Corps does the delineation, especially if the project site is large or contains many wetlands, other special aquatic sites, and other waters. Furthermore, the 45 day period will not start until the delineation has been submitted to or completed by the Corps, as appropriate;

(6) If the proposed activity will result in the loss of greater than 1/10-acre of wetlands and a PCN is required, the prospective permittee must submit a statement describing how the mitigation requirement will be satisfied, or explaining why the adverse environmental effects are no more than minimal and why compensatory mitigation should not be required. As an alternative, the prospective permittee may submit a conceptual or detailed mitigation plan.

(7) For non-Federal permittees, if any listed species or designated critical habitat might be affected or is in the vicinity of the activity, or if the activity is located in designated critical habitat, the PCN must include the name(s) of those endangered or threatened species that might be affected by the proposed activity or utilize the designated critical habitat that might be affected by the proposed activity. For NWP activities that require pre-construction notification, Federal permittees must provide documentation demonstrating compliance with the Endangered Species Act;

(8) For non-Federal permittees, if the NWP activity might have the potential to cause effects to a historic property listed on, determined to be eligible for listing on, or potentially eligible for listing on, the National Register of Historic Places, the PCN must state which historic property might have the potential to be affected by the proposed activity or include a vicinity map indicating the location of the historic property. For NWP activities that require pre-construction notification, Federal permittees must provide documentation demonstrating compliance with section 106 of the National Historic Preservation Act;

(9) For an activity that will occur in a component of the National Wild and Scenic River System, or in a river officially designated by Congress as a “study river” for possible inclusion in the system while the river is in an official study status, the PCN must identify the Wild and Scenic River or the “study river” (see general condition 16); and

(10) For an activity that requires permission from the Corps pursuant to 33 U.S.C. 408 because it will alter or temporarily or permanently occupy or use a U.S. Army Corps of Engineers federally authorized civil works project, the pre-construction notification must include a statement confirming that the project proponent has submitted a written request for section 408 permission from the Corps office having jurisdiction over that USACE project.

(c) Form of Pre-Construction Notification: The standard individual permit application form (Form ENG 4345) may be used, but the completed application form must clearly indicate that it is an NWP PCN and must include all of the applicable information required in paragraphs (b)(1) through (10) of this general condition. A letter containing the required information may also be used. Applicants may provide electronic files of PCNs and

supporting materials if the district engineer has established tools and procedures for electronic submittals.

(d) Agency Coordination: (1) The district engineer will consider any comments from Federal and state agencies concerning the proposed activity's compliance with the terms and conditions of the NWPs and the need for mitigation to reduce the activity's adverse environmental effects so that they are no more than minimal.

(2) Agency coordination is required for: (i) all NWP activities that require pre-construction notification and result in the loss of greater than 1/2-acre of waters of the United States; (ii) NWP 21, 29, 39, 40, 42, 43, 44, 50, 51, and 52 activities that require pre-construction notification and will result in the loss of greater than 300 linear feet of stream bed; (iii) NWP 13 activities in excess of 500 linear feet, fills greater than one cubic yard per running foot, or involve discharges of dredged or fill material into special aquatic sites; and (iv) NWP 54 activities in excess of 500 linear feet, or that extend into the waterbody more than 30 feet from the mean low water line in tidal waters or the ordinary high water mark in the Great Lakes.

(3) When agency coordination is required, the district engineer will immediately provide (e.g., via e-mail, facsimile transmission, overnight mail, or other expeditious manner) a copy of the complete PCN to the appropriate Federal or state offices (FWS, state natural resource or water quality agency, EPA, and, if appropriate, the NMFS). With the exception of NWP 37, these agencies will have 10 calendar days from the date the material is transmitted to notify the district engineer via telephone, facsimile transmission, or e-mail that they intend to provide substantive, site-specific comments. The comments must explain why the agency believes the adverse environmental effects will be more than minimal. If so contacted by an agency, the district engineer will wait an additional 15 calendar days before making a decision on the pre-construction notification. The district engineer will fully consider agency comments received within the specified time frame concerning the proposed activity's compliance with the terms and conditions of the NWPs, including the need for mitigation to ensure the net adverse environmental effects of the proposed activity are no more than minimal. The district engineer will provide no response to the resource agency, except as provided below. The district engineer will indicate in the administrative record associated with each pre-construction notification that the resource agencies' concerns were considered. For NWP 37, the emergency watershed protection and rehabilitation activity may proceed immediately in cases where there is an unacceptable hazard to life or a significant loss of property or economic hardship will occur. The district engineer will consider any comments received to decide whether the NWP 37 authorization should be modified, suspended, or revoked in accordance with the procedures at 33 CFR 330.5.

(4) In cases of where the prospective permittee is not a Federal agency, the district engineer will provide a response to NMFS within 30 calendar days of receipt of any Essential Fish Habitat conservation recommendations, as required by section 305(b)(4)(B) of the Magnuson-Stevens Fishery Conservation and Management Act.

(5) Applicants are encouraged to provide the Corps with either electronic files or multiple copies of pre-construction notifications to expedite agency coordination.

### **DISTRICT ENGINEER'S DECISION**

1. In reviewing the PCN for the proposed activity, the district engineer will determine whether the activity authorized by the NWP will result in more than minimal

individual or cumulative adverse environmental effects or may be contrary to the public interest. If a project proponent requests authorization by a specific NWP, the district engineer should issue the NWP verification for that activity if it meets the terms and conditions of that NWP, unless he or she determines, after considering mitigation, that the proposed activity will result in more than minimal individual and cumulative adverse effects on the aquatic environment and other aspects of the public interest and exercises discretionary authority to require an individual permit for the proposed activity. For a linear project, this determination will include an evaluation of the individual crossings of waters of the United States to determine whether they individually satisfy the terms and conditions of the NWP(s), as well as the cumulative effects caused by all of the crossings authorized by NWP. If an applicant requests a waiver of the 300 linear foot limit on impacts to streams or of an otherwise applicable limit, as provided for in NWPs 13, 21, 29, 36, 39, 40, 42, 43, 44, 50, 51, 52, or 54, the district engineer will only grant the waiver upon a written determination that the NWP activity will result in only minimal individual and cumulative adverse environmental effects. For those NWPs that have a waivable 300 linear foot limit for losses of intermittent and ephemeral stream bed and a 1/2-acre limit (i.e., NWPs 21, 29, 39, 40, 42, 43, 44, 50, 51, and 52), the loss of intermittent and ephemeral stream bed, plus any other losses of jurisdictional waters and wetlands, cannot exceed 1/2-acre.

2. When making minimal adverse environmental effects determinations the district engineer will consider the direct and indirect effects caused by the NWP activity. He or she will also consider the cumulative adverse environmental effects caused by activities authorized by NWP and whether those cumulative adverse environmental effects are no more than minimal. The district engineer will also consider site specific factors, such as the environmental setting in the vicinity of the NWP activity, the type of resource that will be affected by the NWP activity, the functions provided by the aquatic resources that will be affected by the NWP activity, the degree or magnitude to which the aquatic resources perform those functions, the extent that aquatic resource functions will be lost as a result of the NWP activity (e.g., partial or complete loss), the duration of the adverse effects (temporary or permanent), the importance of the aquatic resource functions to the region (e.g., watershed or ecoregion), and mitigation required by the district engineer. If an appropriate functional or condition assessment method is available and practicable to use, that assessment method may be used by the district engineer to assist in the minimal adverse environmental effects determination. The district engineer may add case-specific special conditions to the NWP authorization to address site-specific environmental concerns.

3. If the proposed activity requires a PCN and will result in a loss of greater than 1/10-acre of wetlands, the prospective permittee should submit a mitigation proposal with the PCN. Applicants may also propose compensatory mitigation for NWP activities with smaller impacts, or for impacts to other types of waters (e.g., streams). The district engineer will consider any proposed compensatory mitigation or other mitigation measures the applicant has included in the proposal in determining whether the net adverse environmental effects of the proposed activity are no more than minimal. The compensatory mitigation proposal may be either conceptual or detailed. If the district engineer determines that the activity complies with the terms and conditions of the NWP and that the adverse environmental effects are no more than minimal, after considering mitigation, the district engineer will notify the permittee and

include any activity-specific conditions in the NWP verification the district engineer deems necessary. Conditions for compensatory mitigation requirements must comply with the appropriate provisions at 33 CFR 332.3(k). The district engineer must approve the final mitigation plan before the permittee commences work in waters of the United States, unless the district engineer determines that prior approval of the final mitigation plan is not practicable or not necessary to ensure timely completion of the required compensatory mitigation. If the prospective permittee elects to submit a compensatory mitigation plan with the PCN, the district engineer will expeditiously review the proposed compensatory mitigation plan. The district engineer must review the proposed compensatory mitigation plan within 45 calendar days of receiving a complete PCN and determine whether the proposed mitigation would ensure the NWP activity results in no more than minimal adverse environmental effects. If the net adverse environmental effects of the NWP activity (after consideration of the mitigation proposal) are determined by the district engineer to be no more than minimal, the district engineer will provide a timely written response to the applicant. The response will state that the NWP activity can proceed under the terms and conditions of the NWP, including any activity-specific conditions added to the NWP authorization by the district engineer.

4. If the district engineer determines that the adverse environmental effects of the proposed activity are more than minimal, then the district engineer will notify the applicant either: (a) that the activity does not qualify for authorization under the NWP and instruct the applicant on the procedures to seek authorization under an individual permit; (b) that the activity is authorized under the NWP subject to the applicant's submission of a mitigation plan that would reduce the adverse environmental effects so that they are no more than minimal; or (c) that the activity is authorized under the NWP with specific modifications or conditions. Where the district engineer determines that mitigation is required to ensure no more than minimal adverse environmental effects, the activity will be authorized within the 45-day PCN period (unless additional time is required to comply with general conditions 18, 20, and/or 31, or to evaluate PCNs for activities authorized by NWPs 21, 49, and 50), with activity-specific conditions that state the mitigation requirements. The authorization will include the necessary conceptual or detailed mitigation plan or a requirement that the applicant submit a mitigation plan that would reduce the adverse environmental effects so that they are no more than minimal. When compensatory mitigation is required, no work in waters of the United States may occur until the district engineer has approved a specific mitigation plan or has determined that prior approval of a final mitigation plan is not practicable or not necessary to ensure timely completion of the required compensatory mitigation.

### **FURTHER INFORMATION**

1. District Engineers have authority to determine if an activity complies with the terms and conditions of an NWP.
2. NWPs do not obviate the need to obtain other federal, state, or local permits, approvals, or authorizations required by law.
3. NWPs do not grant any property rights or exclusive privileges.
4. NWPs do not authorize any injury to the property or rights of others.
5. NWPs do not authorize interference with any existing or proposed Federal project (see general condition 31).

## DEFINITIONS

Best management practices (BMPs): Policies, practices, procedures, or structures implemented to mitigate the adverse environmental effects on surface water quality resulting from development. BMPs are categorized as structural or non-structural.

Compensatory mitigation: The restoration (re-establishment or rehabilitation), establishment (creation), enhancement, and/or in certain circumstances preservation of aquatic resources for the purposes of offsetting unavoidable adverse impacts which remain after all appropriate and practicable avoidance and minimization has been achieved.

Currently serviceable: Useable as is or with some maintenance, but not so degraded as to essentially require reconstruction.

Direct effects: Effects that are caused by the activity and occur at the same time and place.

Discharge: The term “discharge” means any discharge of dredged or fill material into waters of the United States.

Ecological reference: A model used to plan and design an aquatic habitat and riparian area restoration, enhancement, or establishment activity under NWP 27. An ecological reference may be based on the structure, functions, and dynamics of an aquatic habitat type or a riparian area type that currently exists in the region where the proposed NWP 27 activity is located. Alternatively, an ecological reference may be based on a conceptual model for the aquatic habitat type or riparian area type to be restored, enhanced, or established as a result of the proposed NWP 27 activity. An ecological reference takes into account the range of variation of the aquatic habitat type or riparian area type in the region.

Enhancement: The manipulation of the physical, chemical, or biological characteristics of an aquatic resource to heighten, intensify, or improve a specific aquatic resource function(s). Enhancement results in the gain of selected aquatic resource function(s), but may also lead to a decline in other aquatic resource function(s). Enhancement does not result in a gain in aquatic resource area.

Ephemeral stream: An ephemeral stream has flowing water only during, and for a short duration after, precipitation events in a typical year. Ephemeral stream beds are located above the water table year-round. Groundwater is not a source of water for the stream. Runoff from rainfall is the primary source of water for stream flow.

Establishment (creation): The manipulation of the physical, chemical, or biological characteristics present to develop an aquatic resource that did not previously exist at an upland site. Establishment results in a gain in aquatic resource area.

High Tide Line: The line of intersection of the land with the water’s surface at the maximum height reached by a rising tide. The high tide line may be determined, in the absence of actual data, by a line of oil or scum along shore objects, a more or less continuous deposit of fine shell or debris on the foreshore or berm, other physical markings or characteristics, vegetation lines, tidal gages, or other suitable means that delineate the general height reached by a rising tide. The line encompasses spring high tides and other high tides that occur with periodic frequency but does not include storm surges in which there is a departure from the normal or predicted reach of the tide due to the piling up of water against a coast by strong winds such as those accompanying a hurricane or other intense storm.

Historic Property: Any prehistoric or historic district, site (including archaeological site), building, structure, or other object included in, or eligible for inclusion in, the National



Register of Historic Places maintained by the Secretary of the Interior. This term includes artifacts, records, and remains that are related to and located within such properties. The term includes properties of traditional religious and cultural importance to an Indian tribe or Native Hawaiian organization and that meet the National Register criteria (36 CFR part 60).

Independent utility: A test to determine what constitutes a single and complete non-linear project in the Corps Regulatory Program. A project is considered to have independent utility if it would be constructed absent the construction of other projects in the project area. Portions of a multi-phase project that depend upon other phases of the project do not have independent utility. Phases of a project that would be constructed even if the other phases were not built can be considered as separate single and complete projects with independent utility.

Indirect effects: Effects that are caused by the activity and are later in time or farther removed in distance, but are still reasonably foreseeable.

Intermittent stream: An intermittent stream has flowing water during certain times of the year, when groundwater provides water for stream flow. During dry periods, intermittent streams may not have flowing water. Runoff from rainfall is a supplemental source of water for stream flow.

Loss of waters of the United States: Waters of the United States that are permanently adversely affected by filling, flooding, excavation, or drainage because of the regulated activity. Permanent adverse effects include permanent discharges of dredged or fill material that change an aquatic area to dry land, increase the bottom elevation of a waterbody, or change the use of a waterbody. The acreage of loss of waters of the United States is a threshold measurement of the impact to jurisdictional waters for determining whether a project may qualify for an NWP; it is not a net threshold that is calculated after considering compensatory mitigation that may be used to offset losses of aquatic functions and services. The loss of stream bed includes the acres or linear feet of stream bed that are filled or excavated as a result of the regulated activity. Waters of the United States temporarily filled, flooded, excavated, or drained, but restored to pre-construction contours and elevations after construction, are not included in the measurement of loss of waters of the United States. Impacts resulting from activities that do not require Department of the Army authorization, such as activities eligible for exemptions under section 404(f) of the Clean Water Act, are not considered when calculating the loss of waters of the United States.

Navigable waters: Waters subject to section 10 of the Rivers and Harbors Act of 1899. These waters are defined at 33 CFR part 329.

Non-tidal wetland: A non-tidal wetland is a wetland that is not subject to the ebb and flow of tidal waters. Non-tidal wetlands contiguous to tidal waters are located landward of the high tide line (i.e., spring high tide line).

Open water: For purposes of the NWPs, an open water is any area that in a year with normal patterns of precipitation has water flowing or standing above ground to the extent that an ordinary high water mark can be determined. Aquatic vegetation within the area of flowing or standing water is either non-emergent, sparse, or absent. Vegetated shallows are considered to be open waters. Examples of "open waters" include rivers, streams, lakes, and ponds.

Ordinary High Water Mark: An ordinary high water mark is a line on the shore established by the fluctuations of water and indicated by physical characteristics, or by other appropriate means that consider the characteristics of the surrounding areas.

Perennial stream: A perennial stream has flowing water year-round during a typical year. The water table is located above the stream bed for most of the year. Groundwater is the

primary source of water for stream flow. Runoff from rainfall is a supplemental source of water for stream flow.

Practicable: Available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purposes.

Pre-construction notification: A request submitted by the project proponent to the Corps for confirmation that a particular activity is authorized by nationwide permit. The request may be a permit application, letter, or similar document that includes information about the proposed work and its anticipated environmental effects. Pre-construction notification may be required by the terms and conditions of a nationwide permit, or by regional conditions. A pre-construction notification may be voluntarily submitted in cases where pre-construction notification is not required and the project proponent wants confirmation that the activity is authorized by nationwide permit.

Preservation: The removal of a threat to, or preventing the decline of, aquatic resources by an action in or near those aquatic resources. This term includes activities commonly associated with the protection and maintenance of aquatic resources through the implementation of appropriate legal and physical mechanisms. Preservation does not result in a gain of aquatic resource area or functions.

Protected tribal resources: Those natural resources and properties of traditional or customary religious or cultural importance, either on or off Indian lands, retained by, or reserved by or for, Indian tribes through treaties, statutes, judicial decisions, or executive orders, including tribal trust resources.

Re-establishment: The manipulation of the physical, chemical, or biological characteristics of a site with the goal of returning natural/historic functions to a former aquatic resource. Re-establishment results in rebuilding a former aquatic resource and results in a gain in aquatic resource area and functions.

Rehabilitation: The manipulation of the physical, chemical, or biological characteristics of a site with the goal of repairing natural/historic functions to a degraded aquatic resource. Rehabilitation results in a gain in aquatic resource function, but does not result in a gain in aquatic resource area.

Restoration: The manipulation of the physical, chemical, or biological characteristics of a site with the goal of returning natural/historic functions to a former or degraded aquatic resource. For the purpose of tracking net gains in aquatic resource area, restoration is divided into two categories: re-establishment and rehabilitation.

Riffle and pool complex: Riffle and pool complexes are special aquatic sites under the 404(b)(1) Guidelines. Riffle and pool complexes sometimes characterize steep gradient sections of streams. Such stream sections are recognizable by their hydraulic characteristics. The rapid movement of water over a coarse substrate in riffles results in a rough flow, a turbulent surface, and high dissolved oxygen levels in the water. Pools are deeper areas associated with riffles. A slower stream velocity, a streaming flow, a smooth surface, and a finer substrate characterize pools.

Riparian areas: Riparian areas are lands next to streams, lakes, and estuarine- marine shorelines. Riparian areas are transitional between terrestrial and aquatic ecosystems, through which surface and subsurface hydrology connects riverine, lacustrine, estuarine, and marine waters with their adjacent wetlands, non-wetland waters, or uplands. Riparian areas provide a variety of ecological functions and services and help improve or maintain local water quality. (See general condition 23.)

Shellfish seeding: The placement of shellfish seed and/or suitable substrate to increase shellfish production. Shellfish seed consists of immature individual shellfish or individual shellfish attached to shells or shell fragments (i.e., spat on shell). Suitable substrate may consist of shellfish shells, shell fragments, or other appropriate materials placed into waters for shellfish habitat.

Single and complete linear project: A linear project is a project constructed for the purpose of getting people, goods, or services from a point of origin to a terminal point, which often involves multiple crossings of one or more waterbodies at separate and distant locations. The term “single and complete project” is defined as that portion of the total linear project proposed or accomplished by one owner/developer or partnership or other association of owners/developers that includes all crossings of a single water of the United States (i.e., a single waterbody) at a specific location. For linear projects crossing a single or multiple waterbodies several times at separate and distant locations, each crossing is considered a single and complete project for purposes of NWP authorization. However, individual channels in a braided stream or river, or individual arms of a large, irregularly shaped wetland or lake, etc., are not separate waterbodies, and crossings of such features cannot be considered separately.

Single and complete non-linear project: For non-linear projects, the term “single and complete project” is defined at 33 CFR 330.2(i) as the total project proposed or accomplished by one owner/developer or partnership or other association of owners/developers. A single and complete non-linear project must have independent utility (see definition of “independent utility”). Single and complete non-linear projects may not be “piecemealed” to avoid the limits in an NWP authorization.

Stormwater management: Stormwater management is the mechanism for controlling stormwater runoff for the purposes of reducing downstream erosion, water quality degradation, and flooding and mitigating the adverse effects of changes in land use on the aquatic environment.

Stormwater management facilities: Stormwater management facilities are those facilities, including but not limited to, stormwater retention and detention ponds and best management practices, which retain water for a period of time to control runoff and/or improve the quality (i.e., by reducing the concentration of nutrients, sediments, hazardous substances and other pollutants) of stormwater runoff.

Stream bed: The substrate of the stream channel between the ordinary high water marks. The substrate may be bedrock or inorganic particles that range in size from clay to boulders. Wetlands contiguous to the stream bed, but outside of the ordinary high water marks, are not considered part of the stream bed.

Stream channelization: The manipulation of a stream’s course, condition, capacity, or location that causes more than minimal interruption of normal stream processes. A channelized stream remains a water of the United States.

Structure: An object that is arranged in a definite pattern of organization. Examples of structures include, without limitation, any pier, boat dock, boat ramp, wharf, dolphin, weir, boom, breakwater, bulkhead, revetment, riprap, jetty, artificial island, artificial reef, permanent mooring structure, power transmission line, permanently moored floating vessel, piling, aid to navigation, or any other manmade obstacle or obstruction.

Tidal wetland: A tidal wetland is a jurisdictional wetland that is inundated by tidal waters. Tidal waters rise and fall in a predictable and measurable rhythm or cycle due to the gravitational pulls of the moon and sun. Tidal waters end where the rise and fall of the water

surface can no longer be practically measured in a predictable rhythm due to masking by other waters, wind, or other effects. Tidal wetlands are located channelward of the high tide line.

Tribal lands: Any lands title to which is either: 1) held in trust by the United States for the benefit of any Indian tribe or individual; or 2) held by any Indian tribe or individual subject to restrictions by the United States against alienation.

Tribal rights: Those rights legally accruing to a tribe or tribes by virtue of inherent sovereign authority, unextinguished aboriginal title, treaty, statute, judicial decisions, executive order or agreement, and that give rise to legally enforceable remedies.

Vegetated shallows: Vegetated shallows are special aquatic sites under the 404(b)(1) Guidelines. They are areas that are permanently inundated and under normal circumstances have rooted aquatic vegetation, such as seagrasses in marine and estuarine systems and a variety of vascular rooted plants in freshwater systems.

Waterbody: For purposes of the NWPs, a waterbody is a jurisdictional water of the United States. If a wetland is adjacent to a waterbody determined to be a water of the United States, that waterbody and any adjacent wetlands are considered together as a single aquatic unit (see 33 CFR 328.4(c)(2)). Examples of “waterbodies” include streams, rivers, lakes, ponds, and wetlands.

## **FINAL 2017 REGIONAL CONDITIONS**

### *NOTICE ABOUT WEB LINKS IN THIS DOCUMENT:*

*The web links (both internal to our Wilmington District and any external links to collaborating agencies) in this document are valid at the time of publication. However, the Wilmington District Regulatory Program web page addresses, as with other agency web sites, may change over the timeframe of the five-year Nationwide Permit renewal cycle, in response to policy mandates or technology advances. While we will make every effort to check on the integrity of our web links and provide re-direct pages whenever possible, we ask that you report any broken links to us so we can keep the page information current and usable. We apologize in advanced for any broken links that you may encounter, and we ask that you navigate from the Regulatory home page (Regulatory Permit Program Wetlands and Streams) of the Wilmington District Corps of Engineers, to the “Permits” section of our web site to find links for pages that cannot be found by clicking directly on the listed web link in this document.*

### **Final 2017 Regional Conditions for Nationwide Permits (NWP) in the Wilmington District**

#### **1.0 Excluded Waters**

The Corps has identified waters that will be excluded from the use of all NWP’s during certain timeframes. These waters are:

##### **1.1 Anadromous Fish Spawning Areas**

Waters of the United States identified by either the North Carolina Division of Marine Fisheries (NCDMF) or the North Carolina Wildlife Resources Commission (NCWRC) as anadromous fish spawning areas are excluded during the period between February 15 and June 30, without prior written approval from the Corps and either NCDMF or NCWRC.

##### **1.2 Trout Waters Moratorium**

Waters of the United States in the designated trout watersheds of North Carolina are excluded during the period between October 15 and April 15 without prior written approval from the NCWRC, or from the Eastern Band of Cherokee Indians (EBCI) Fisheries and Wildlife Management (FWM) office if the project is located on EBCI trust land. (See Section 2.7 for information on the designated trout watersheds).

##### **1.3 Sturgeon Spawning Areas as Designated by the National Marine Fisheries Service (NMFS)**

Waters of the United States designated as sturgeon spawning areas are excluded during the period between February 1 and June 30, without prior written approval from the NMFS.

## **2.0 Waters Requiring Additional Notification**

The Corps has identified waters that will be subject to additional notification requirements for activities authorized by all NWPs. These waters are:

### **2.1 Western NC Counties that Drain to Designated Critical Habitat**

For proposed activities within waters of the United States that require a Pre-Construction Notification (PCN) and are located in the sixteen counties listed below, permittees must provide a copy of the PCN to the U.S. Fish and Wildlife Service (USFWS), 160 Zillicoa Street, Asheville, North Carolina 28801. This PCN must be sent concurrently to the U.S. Fish and Wildlife Service and the Corps Asheville Regulatory Field Office. Please see General Condition 18 for specific notification requirements related to the Endangered Species Act and the below website for information on the location of designated critical habitat.

Counties with tributaries that drain to designated critical habitat that require notification to the Asheville U.S. Fish and Wildlife Service: Avery, Cherokee, Forsyth, Graham, Haywood, Henderson, Jackson, Macon, Mecklenburg, Mitchell, Stokes, Surry, Swain, Transylvania, Union and Yancey.

Website and office addresses for Endangered Species Act Information:

The Wilmington District has developed the following website for permittees which provides guidelines on how to review linked websites and maps in order to fulfill NWP General Condition 18 requirements:

<http://www.saw.usace.army.mil/Missions/RegulatoryPermitProgram/AgencyCoordination/ESA.asp>

Permittees who do not have internet access may contact the appropriate U.S. Fish and Wildlife Service offices listed below or Corps at (910) 251-4633:

Asheville U.S. Fish and Wildlife Service Office counties: All counties west of and including Anson, Stanly, Davidson, Forsythe and Stokes Counties.

U.S. Fish and Wildlife Service  
Asheville Field Office  
160 Zillicoa Street  
Asheville, NC 28801  
Telephone: (828) 258-3939

Raleigh U.S. Fish and Wildlife Service Office counties: all counties east of and including Richmond, Montgomery, Randolph, Guilford, and Rockingham Counties.

U.S. Fish and Wildlife Service  
Raleigh Field Office  
Post Office Box 33726

Raleigh, NC 27636-3726  
Telephone: (919) 856-4520

## **2.2 Special Designation Waters**

Prior to the use of any NWP, except NWP 3, that involves a discharge of dredged or fill material in any of the following identified waters and/or adjacent wetlands in North Carolina, permittees shall submit a PCN to the District Engineer prior to commencing the activity (see General Condition 32). The North Carolina waters and wetlands that require additional notification requirements are:

“Outstanding Resource Waters” (ORW) or “High Quality Waters” (HQW) as designated by the North Carolina Environmental Management Commission; “Primary Nursery Areas” (PNA), including inland PNA, as designated by the North Carolina Marine Fisheries Commission and the NCWRC; or wetlands adjacent to these waters. Definitions of ORW, HQW and PNA waters can be found in the North Carolina State Administrative Code, Title 15A, Subchapters 2B and 10C (15A NCAC 02B, 15A NCAC 10C) and at the following World Wide Web page: <http://reports.oah.state.nc.us/ncac.asp?folderName=\Title%2015A%20-%20Environmental%20Quality&lookupError=15A%20NCAC%20000%20>. Surface water classifications for waters in North Carolina can be viewed at the North Carolina Division of Water Resources website or at the following World Wide Web Page: <https://deq.nc.gov/about/divisions/water-resources/planning/classification-standards/classifications>

Permittees who do not have internet access may contact the Corps at (910) 251- 4633.

## **2.3 Coastal Area Management Act (CAMA) Areas of Environmental Concern**

Non-federal permittees for any NWP in a designated “Area of Environmental Concern” (AEC) in the twenty (20) counties of Eastern North Carolina covered by the North Carolina Coastal Area Management Act (CAMA) must also obtain the required CAMA permit. Development activities for non-federal projects may not commence until a copy of the approved CAMA permit is furnished to the appropriate Wilmington District Regulatory Field Office (Wilmington Field Office – 69 Darlington Avenue, Wilmington, NC 28403, (910) 251-4802 or Washington Field Office – 2407 West 5th Street, Washington, NC 27889, (910) 251-4610).

## **2.4 Barrier Islands**

Prior to the use of any NWP on a barrier island of North Carolina, permittees must submit a PCN to the District Engineer prior to commencing the activity (see General Condition 32).

## **2.5 Mountain or Piedmont Bogs**

Prior to the use of any NWP in a Bog, as classified by the North Carolina Wetland Assessment Methodology (NCWAM), permittees shall submit a PCN to the District Engineer prior to commencing the activity (see General Condition 32). The latest version of NCWAM can be

viewed on the Corps RIBITS (Regulatory In-lieu Fee and Bank Information Tracking System) website or at the following World Wide Web Page:  
[https://ribits.usace.army.mil/ribits\\_apex/f?p=107:27:0::NO::](https://ribits.usace.army.mil/ribits_apex/f?p=107:27:0::NO::)

## 2.6 Animal Waste Facilities

Prior to use of any NWP for construction of animal waste facilities in waters of the United States, including wetlands, permittees shall submit a PCN to the District Engineer prior to commencing the activity (see General Condition 32).

## 2.7 Trout Waters

Prior to any discharge of dredge or fill material into streams, waterbodies or wetlands within the 294 designated trout watersheds of North Carolina, the permittee shall submit a PCN (see General Condition 32) to the District Engineer prior to commencing the activity, unless other thresholds are established in the Regional Conditions in Section 4 (Additional Regional Conditions for Specific Nationwide Permits). The permittee shall also provide a copy of the notification to the appropriate NCWRC office, or to the EBCI FWM Office (if the project is located on EBCI trust land), to facilitate the determination of any potential impacts to designated Trout Waters.

Notification to the Corps will include a statement with the name of the NCWRC or EBCI FWM biologist contacted, the date of the notification, the location of work, a delineation of wetlands and waters, a discussion of alternatives to working in the mountain trout waters, why alternatives were not selected, and, if applicable, a plan to provide compensatory mitigation for all unavoidable adverse impacts to mountain trout waters.

NCWRC and NC Trout Watersheds:

<b>NCWRC Contact**</b>	<b>Counties that are entirely within Trout Watersheds*</b>	<b>Counties that are partially within Trout Watersheds*</b>
Mountain Coordinator Balsam Depot 20830 Great Smoky Mountain Expressway Waynesville, NC 28786 Telephone: (828) 558-6011  For NCDOT Projects:  NCDOT Coordinator 206 Charter. Street Albemarle, NC 28001 Telephone: (704) 982-9181	Alleghany    Jackson Ashe            Macon Avery            Swain Graham        Transylvania Haywood       Watauga	Burke            McDowell Buncombe      Mitchell Caldwell        Polk Cherokee       Rutherford Clay             Surry Henderson     Wilkes Madison         Yancey



\*NOTE: To determine notification requirements, contact the Corps Asheville Regulatory Field Office at (828) 271-7980 or view maps for each County at the following World Wide Web page: <http://www.saw.usace.army.mil/Missions/Regulatory-Permit-Program/Agency-Coordination/Trout/>.

\*\*If a project is located on EBCI trust land, submit the PCN in accordance with Section 3.14. Contact the Corps Asheville Regulatory Field Office at (828) 271-7980 with questions.

## **2.8 Western NC Waters and Corridors**

The permittee shall submit a PCN (see General Condition 32) to the District Engineer prior to commencing the activity in waters of the United States if the activity will occur within any of the following identified waters in western North Carolina, within 0.5 mile on either side of these waters, or within 0.75 mile of the Little Tennessee River, as measured from the top of the bank of the respective water (i.e., river, stream, or creek):

Brasstown Creek  
Burningtown Creek  
Cane River  
Caney Fork  
Cartoogechaye Creek  
Chattooga River  
Cheoah River  
Cowee Creek  
Cullasaja River  
Deep Creek  
Ellijay Creek  
French Broad River  
Garden Creek  
Hiwassee River  
Hominy Creek  
Iotla Creek  
Little Tennessee River (within the river or within 0.75 mile on either side of this river)  
Nantahala River  
Nolichucky River  
North Fork French Broad River  
North Toe River  
Nottley River  
Oconaluftee River (portion not located on trust/EBCI land)  
Peachtree Creek  
Shooting Creek  
Snowbird Creek  
South Toe River  
Stecoah Creek  
Swannanoa River  
Sweetwater Creek

Tuckasegee River (also spelled Tuckaseegee or Tuckaseigee)  
Valley River  
Watauga Creek  
Watauga River  
Wayah Creek  
West Fork French Broad River

To determine notification requirements, contact the Corps Asheville Regulatory Field Office at (828) 271-7980 or view maps for all corridors at the following World Wide Web page:  
<http://www.saw.usace.army.mil/Missions/Regulatory-Permit-Program/Agency-Coordination/Designated-Special-Waters.aspx>

### **3.0 List of Corps Regional Conditions for All Nationwide Permits**

The following conditions apply to all Nationwide Permits in the Wilmington District:

#### **3.1 Limitation of Loss of Stream Bed**

NWPs may not be used for activities that may result in the loss or degradation of more than 300 total linear feet of stream bed, unless the District Engineer has waived the 300 linear foot limit for ephemeral and intermittent streams on a case-by-case basis and has determined that the proposed activity will result in minimal individual and cumulative adverse impacts to the aquatic environment. Waivers for the loss of ephemeral and intermittent streams must be in writing and documented by appropriate/accepted stream quality assessments\*. This waiver only applies to the 300 linear feet threshold for NWPs.

This Regional Condition does not apply to NWP 23 (Approved Categorical Exclusions).

\*NOTE: Permittees should utilize the most current methodology prescribed by Wilmington District to assess stream function and quality. Information can be found at:  
[https://ribits.usace.army.mil/ribits\\_apex/f?p=107:27:0::NO::](https://ribits.usace.army.mil/ribits_apex/f?p=107:27:0::NO::)

#### **3.2 Mitigation for Loss of Stream Bed**

For any NWP that results in a loss of more than 150 linear feet of stream, the permittee shall provide a mitigation proposal to compensate for more than minimal individual and cumulative adverse impacts to the aquatic environment. For stream losses of 150 linear feet or less that require a PCN, the District Engineer may determine, on a case-by-case basis, that compensatory mitigation is required to ensure that the activity results in minimal adverse effect on the aquatic environment.

#### **3.3 Pre-construction Notification for Loss of Streambed Exceeding 150 Feet**

Prior to use of any NWP for any activity which impacts more than 150 total linear feet of perennial stream, intermittent or ephemeral stream, the permittee shall submit a PCN to the District Engineer prior to commencing the activity (see General Condition 32). This applies to

NWPs that do not have specific notification requirements. If a NWP has specific notification requirements, the requirements of the NWP should be followed.

### **3.4 Restriction on Use of Live Concrete**

For all NWPs which allow the use of concrete as a building material, live or fresh concrete, including bags of uncured concrete, may not come into contact with the water in or entering into waters of the United States. Water inside coffer dams or casings that has been in contact with wet concrete shall only be returned to waters of the United States after the concrete is set and cured and when it no longer poses a threat to aquatic organisms.

### **3.5 Requirements for Using Riprap for Bank Stabilization**

For all NWPs that allow for the use of riprap material for bank stabilization, the following measures shall be applied:

**3.5.1.** Where bank stabilization is conducted as part of an activity, natural design, bioengineering and/or geoen지니어ing methods that incorporate natural durable materials, native seed mixes, and native plants and shrubs are to be utilized to the maximum extent practicable.

**3.5.2.** Filter cloth must be placed underneath the riprap as an additional requirement of its use in North Carolina waters. The placement of filter fabric is not required if the riprap will be pushed or “keyed” into the bank of the waterbody. A waiver from the specifications in this Regional Condition may be requested in writing. The waiver will only be issued if it can be demonstrated that the impacts of complying with this Regional Condition would result in greater adverse impacts to the aquatic environment.

**3.5.3.** The placement of riprap shall be limited to the areas depicted on submitted work plan drawings.

**3.5.4.** The riprap material shall be clean and free from loose dirt or any pollutant except in trace quantities that would not have an adverse environmental effect.

**3.5.5.** It shall be of a size sufficient to prevent its movement from the authorized alignment by natural forces under normal conditions.

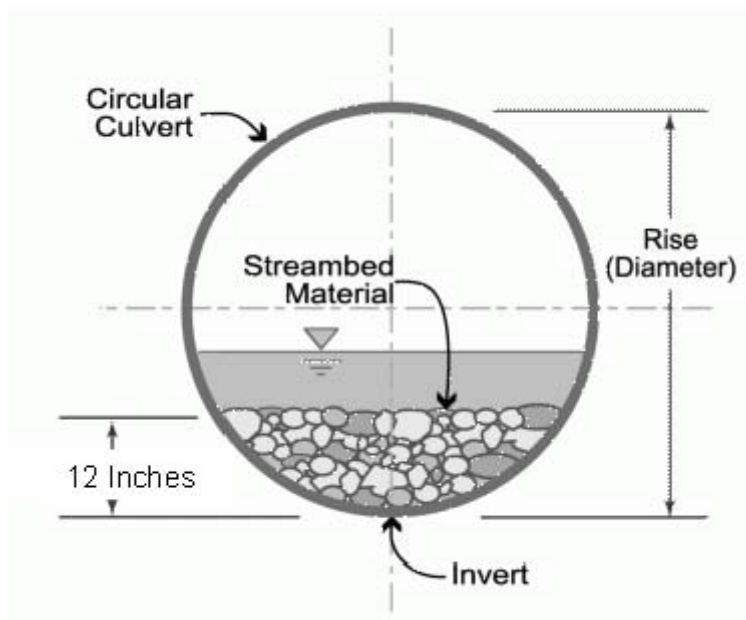
**3.5.6.** The riprap material shall consist of clean rock or masonry material such as, but not limited to, granite, marl, or broken concrete.

### **3.6 Requirements for Culvert Placement**

**3.6.1** For all NWPs that involve the construction/installation of culverts, measures will be included in the construction/installation that will promote the safe passage of fish and other aquatic organisms. The dimension, pattern, and profile of the stream above and below a pipe or culvert should not be modified by altering the width or depth of the stream profile in connection with the construction activity. The width, height, and gradient of a proposed culvert should be

sufficient to pass the average historical low flow and spring flow without adversely altering flow velocity. Spring flow is the seasonal sustained high flow that typically occurs in the spring. Spring flows should be determined from gage data, if available. In the absence of such data, bank-full flow can be used as a comparable indicator.

In Public Trust Areas of Environmental Concern (AEC) and/or the Estuarine Waters AEC as designated by the Coastal Area Management Act (CAMA): All pipes/culverts must be sufficiently sized to allow for the burial of the bottom of the culvert at least one foot below normal bed elevation.



In all other areas: Culverts greater than 48 inches in diameter will be buried at least one foot below the bed of the stream. Culverts 48 inches in diameter or less shall be buried to maintain aquatic passage and to maintain passage during drought or low flow conditions, and every effort shall be made to maintain the existing channel slope.

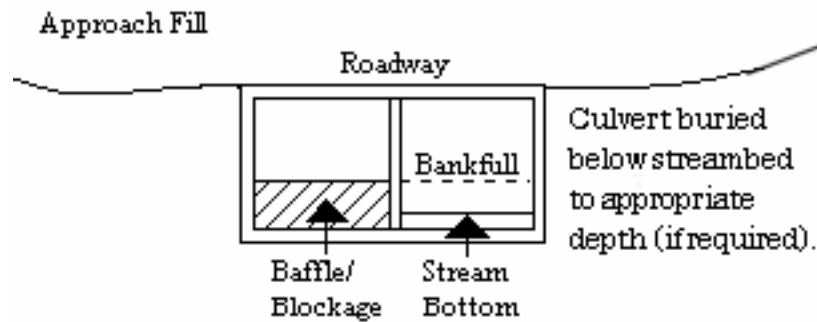
Culverts must be designed and constructed in a manner that minimizes destabilization and head cutting. Destabilizing the channel and head cutting upstream should be considered and appropriate actions incorporated in the design and placement of the culvert.

A waiver from the depth specifications in this condition may be requested, in writing, by the permittee and issued by the Corp; this request must be specific as to the reasons(s) for the request. The waiver will be issued if it can be demonstrated that the proposed design would result in less impacts to the aquatic environment.

All counties: Culverts placed within riparian and/or riverine wetlands must be installed in a manner that does not restrict the flow and circulation patterns of waters of the United States.

Culverts placed across wetland fills purely for the purposes of equalizing surface water do not have to be buried, but the culverts must be of adequate size and/or number to ensure unrestricted transmission of water.

**3.6.2** Bank-full flows (or less) shall be accommodated through maintenance of the existing bank-full channel cross sectional area. Additional culverts or culvert barrels at such crossings shall be allowed only to receive bank-full flows.



**3.6.3** Where adjacent floodplain is available, flows exceeding bank-full should be accommodated by installing culverts at the floodplain elevation. Additional culverts or culvert barrels at such crossings should not be buried, or if buried, must have sills at the inlets to ensure that they only receive flows exceeding bank-full.

**3.6.4** Excavation of existing stream channels shall be limited to the minimum necessary to construct or install the proposed culvert. The final width of the impacted stream at the culvert inlet and outlet should be no greater than the original stream width. A waiver from this condition may be requested in writing; this request must be specific as to the reason(s) for the request. The waiver will be issued if the proposed design would result in less impacts to the aquatic environment and/or if it can be demonstrated that it is not practicable to restore the final width of the impacted stream at the culvert inlet and outlet to the width of the original stream channel.

**3.6.5** The width of the culvert shall be comparable to the width of the stream channel. If the width of the culvert is wider than the stream channel, the culvert shall include baffles, benches and/or sills to maintain the width of the stream channel. A waiver from this condition may be requested in writing; this request must be specific as to the reason(s) for the request. The waiver will be issued if it can be demonstrated that it is not practicable or necessary to include baffles, benches or sills and the design would result in less impacts to the aquatic environment.

### **3.7 Notification to NCDEQ Shellfish Sanitation Section**

Permittees shall notify the NCDEQ Shellfish Sanitation Section prior to dredging in or removing sediment from an area closed to shell fishing where the effluent may be released to an area open for shell fishing or swimming in order to avoid contamination from the disposal area and cause a temporary shellfish closure to be made. Such notification shall also be provided to the appropriate Corps Regulatory Field Office. Any disposal of sand to the ocean beach should occur between November 1 and April 30 when recreational usage is low. Only clean sand

should be used and no dredged sand from closed shell fishing areas may be used. If beach disposal were to occur at times other than stated above or if sand from a closed shell fishing area is to be used, a swimming advisory shall be posted, and a press release shall be issued by the permittee.

### **3.8 Submerged Aquatic Vegetation**

Impacts to Submerged Aquatic Vegetation (SAV) are not authorized by any NWP, except NWP 48, unless EFH Consultation has been completed pursuant to the Magnuson-Stevens Fisheries Conservation and Management Act (Magnuson-Stevens Act). Permittees shall submit a PCN (See NWP General Condition 32) to the District Engineer prior to commencing the activity if the project would affect SAV. The permittee may not begin work until notified by the Corps that the requirements of the Magnuson-Stevens Act have been satisfied and that the activity is authorized.

### **3.9 Sedimentation and Erosion Control Structures and Measures**

All PCNs will identify and describe sedimentation and erosion control structures and measures proposed for placement in waters of the United States. The structures and measures should be depicted on maps, surveys or drawings showing location and impacts to jurisdictional wetlands and streams.

### **3.10 Restoration of Temporary Impacts to Stream Beds**

Upon completion of work that involves temporary stream impacts, streambeds are to be restored to pre-project elevations and widths using natural streambed material such that the impacted stream reach mimics the adjacent upstream and downstream reach. The impacted area shall be backfilled with natural streambed material to a depth of at least 12 inches or to the bottom depth of the impacted area if shallower than 12 inches. An engineered in-stream structure or material can be used to provide protection of a buried structure if it provides benefits to the aquatic environment and can be accomplished by a natural streambed design. A permittee may request a waiver of this condition if it is determined a buried structure needs significant physical protection beyond those provided in this condition. This condition does not apply to NWP 27 – Aquatic Habitat Restoration, Enhancement, and Establishment Activities.

### **3.11 Restoration of Temporary Impacts to Stream Banks**

Upon completion of work involving temporary stream bank impacts, stream banks are to be restored to pre-project grade and contours or beneficial grade and contours if the original bank slope is steep and unstable. Natural durable materials, native seed mixes, and native plants and shrubs are to be utilized in the restoration. Natural designs which use bioengineered and/or geo-engineered methods are to be applied. An engineered structure or material can be used to provide protection of a buried structure if it provides benefits to the stream bank environment, provided it is not in excess of the minimum amount needed for protection and does not exceed an average of one cubic yard per running foot placed along the bank below the plane of the ordinary high water mark. A permittee may request a waiver of this condition if it is determined a buried structure

needs significant physical protection beyond those provided in this condition. This condition does not apply to NWP 27 – Aquatic Habitat Restoration, Enhancement, and Establishment Activities.

### **3.12 Federal Navigation Channel Setbacks and Corps Easements**

**3.12.1** Authorized structures and fills located in or adjacent to Federally authorized waterways will be constructed in accordance with the latest setback criteria established by the Wilmington District Engineer. You may review the setback policy at <http://www.saw.usace.army.mil/Missions/Navigation/Setbacks.aspx>. This general permit does not authorize the construction of hardened or permanently fixed structures within the Federally Authorized Channel Setback, unless the activity is approved by the Corps. The permittee shall submit a PCN (see General Condition 32) to the District Engineer prior to the construction of any structures or fills within the Federally Authorized Channel Setback.

**3.12.2** The permittee shall obtain a Consent to Cross Government Easement from the Wilmington District’s Land Use Coordinator prior to any crossing of the Corps easement and/or prior to commencing construction of any structures, authorized dredging or other work within the right-of-way of, or in proximity to, a federally designated disposal area. The Land Use Coordinator may be contacted at: CESAW-OP-N, 69 Darlington Avenue, Wilmington, North Carolina 28403-1343, email: [SAWWeb-NAV@usace.army.mil](mailto:SAWWeb-NAV@usace.army.mil)

### **3.13 Northern Long-eared Bat – Endangered Species Act Compliance**

The Wilmington District, U.S. Army Corps of Engineers has consulted with the United States Fish and Wildlife Service (USFWS) in regards to the threatened Northern long-eared bat (NLEB) (*Myotis septentrionalis*) and Standard Local Operating Procedures for Endangered Species (SLOPES) have been approved by the Corps and the USFWS. This condition concerns effects to the NLEB only and does not address effects to other federally listed species and/or federally designated critical habitat.

A. Procedures when the Corps is the lead federal\* agency for a project:

The permittee must comply with (1) and (2) below when:

- the project is located in the western 41 counties of North Carolina, to include non-federal aid North Carolina Department of Transportation (NCDOT) projects, OR;
- the project is located in the 59 eastern counties of North Carolina, and is a non-NCDOT project.

\*Generally, if a project is located on private property or on non-federal land, and the project is not being funded by a federal entity, the Corps will be the lead federal agency due to the requirement to obtain Department of the Army authorization to impact waters of the United States. If the project is located on federal land, contact the Corps to determine the lead federal agency.

(1) A permittee using a NWP must check to see if their project is located in the range of the NLEB by using the following website:

<http://www.fws.gov/midwest/endangered/mammals/nleb/pdf/WNSZone.pdf>. If the project is within the range of the NLEB, or if the project includes percussive activities (e.g., blasting, pile driving, etc.), the permittee is then required to check the appropriate website in the paragraph below to discover if their project:

- is located in a 12-digit Hydrologic Unit Code area (“red HUC” - shown as red areas on the map), AND/OR;
- involves percussive activities within 0.25 mile of a red HUC.

Red HUC maps - for the western 41 counties in NC (covered by the Asheville Ecological Services Field Office), check the project location against the electronic maps found at: [http://www.fws.gov/asheville/htmls/project\\_review/NLEB\\_in\\_WNC.html](http://www.fws.gov/asheville/htmls/project_review/NLEB_in_WNC.html). For the eastern 59 counties in NC (covered by the Raleigh Ecological Services Field Office), check the project location against the electronic maps found at:

[https://www.fws.gov/raleigh/NLEB\\_RFO.html](https://www.fws.gov/raleigh/NLEB_RFO.html).

(2) A permittee must submit a PCN to the District Engineer, and receive written authorization from the District Engineer, prior to commencing the activity, if the activity will involve any of the following:

- tree clearing/removal, construction/installation of wind turbines in a red HUC, AND/OR;
- bridge removal or maintenance, unless the bridge has been inspected and there is no evidence of bat use, (applies anywhere in the range of the NLEB), AND/OR;
- percussive activities in a red HUC, or within 0.25 mile of a red HUC.

The permittee may proceed with the activity without submitting a PCN to either the Corps or the USFWS, provided the activity complies with all applicable NWP terms and general and regional conditions, if the permittee’s review under A.(1) and A.(2) above shows that the project is:

- located outside of a red HUC (and there are no percussive activities), and the activity will NOT include bridge removal or maintenance, unless the bridge has been inspected and there is no evidence of bat use, OR;
- located outside of a red HUC and there are percussive activities, but the percussive activities will not occur within 0.25-mile of a red HUC boundary, and the activity will NOT include bridge removal or maintenance, unless the bridge has been inspected and there is no evidence of bat use, OR;



- located in a red HUC, but the activity will NOT include: tree clearing/removal; construction/installation of wind turbines; bridge removal or maintenance, unless the bridge has been inspected and there is no evidence of bat use, and/or; any percussive activities.

B. Procedures when the USACE is not the lead federal agency:

For projects where another federal agency is the lead federal agency - if that other federal agency has completed project-specific ESA Section 7(a)(2) consultation for the NLEB, and has (1) determined that the project would not cause prohibited incidental take of the NLEB, and (2) completed coordination/consultation that is required by the USFWS (per the directions on the respective USFWS office's website), that project may proceed without notification to either the USACE or the USFWS, provided all General and Regional Permit Conditions are met.

The NLEB SLOPES can be viewed on the USACE website at the following World Wide Web Page: <http://www.saw.usace.army.mil/Missions/Regulatory-Permit-Program/Agency-Coordination/ESA/>. Permittees who do not have internet access may contact the USACE at (910) 251- 4633.

### **3.14 Work on Eastern Band of Cherokee Indians Land**

All PCNs submitted for activities in waters of the United States on Eastern Band of Cherokee Indians (EBCI) trust land (i.e., Qualla Boundary and non-contiguous tracts of trust land), must comply with the requirements of the latest MOU between the Wilmington District and the Eastern Band of Cherokee Indians.

## **4.0 Additional Regional Conditions for Specific Nationwide Permits**

### **4.1 NWP #13 – Bank Stabilization**

**4.1.1** Unanchored trees, treetops, or debris may not be used as stream bank stabilization material.

**4.1.2** Properly anchored and cabled structural stabilization techniques, such as timber crib structures, revetments, and root wads, are acceptable materials to stabilize stream banks.

**4.1.3** If riprap stabilization is needed, it should be placed only on the stream banks, or, if it is necessary to be placed in the stream bed, the finished top elevation of the riprap should not exceed that of the original stream bed.

**4.1.4** In designated trout watersheds, PCN is not required for impacts to a maximum of 100 linear feet (150 linear feet for temporary dewatering) of streams or waterbodies for bank stabilization activities not adjoining, adjacent to, or in the relative vicinity of existing stabilization structures. Materials for the stabilization structure(s) and design of the project must be constructed to withstand normal and expected high stream flows. In designated trout waters, the permittee shall submit a PCN (see Regional Condition 2.7 and General Condition 32) to the District Engineer prior to commencing the activity if 1) impacts (other than temporary

dewatering to work in dry conditions) to streams and waterbodies exceed 100 linear feet; 2) temporary impacts to streams or waterbodies associated with dewatering to work in dry conditions exceed 150 linear feet; or 3) the activity will be constructed during the trout waters moratorium (October 15 through April 15).

**4.1.5** The permittee shall submit a PCN to the District Engineer prior to commencing the activity if the activity will involve the discharge of dredged or fill material into more than 150 linear feet of stream channel for the construction of temporary access fills and/or temporary road crossings. The PCN must include a restoration plan that thoroughly describes how all temporary fills will be removed, describes how pre-project conditions will be restored, and includes a timetable for all restoration activities.

## **APPENDIX E – NCDEQ Erosion Control/Stormwater**

**To be provided via Addendum**



## **APPENDIX F – CSX Railroad Encroachment Agreement**



## FACILITY ENCROACHMENT AGREEMENT

THIS AGREEMENT, made and effective as of \_\_\_\_\_, by and between CSX TRANSPORTATION, INC., a Virginia corporation, whose mailing address is 500 Water Street, Jacksonville, Florida 32202, hereinafter called "Licensor," and UNION COUNTY, a political subdivision under the laws of the State of North Carolina, whose mailing address is 500 North Main Street, Monroe, North Carolina 28112, hereinafter called "Licensee," WITNESSETH:

WHEREAS, Licensee desires to construct (unless previously constructed and designated as existing herein), use and maintain the below described facility(ies), hereinafter called "Facilities," over, under or across property owned or controlled by Licensor, at the below described location(s):

1. One (1) thirty-six inch (36") diameter sub-grade pipeline crossing, solely for the conveyance of potable water, located at or near Monroe, Union County, North Carolina, Florence Division, Charlotte Subdivision, Milepost SF-310.34, Latitude N35:01:35.00, Longitude W80:36:12.00;

hereinafter, called the "Encroachment," as shown on print(s) labeled Exhibit "A," attached hereto and made a part hereof;

NOW, THEREFORE, in consideration of the mutual covenants, conditions, terms and agreements herein contained, the parties hereto agree and covenant as follows:

### 1. LICENSE:

1.1 Subject to Article 17, Licensor, insofar as it has the legal right, power and authority to do so, and its present title permits, and subject to:

(A) Licensor's present and future right to occupy, possess and use its property within the area of the Encroachment for any and all purposes, including but not limited to Licensor's track(s) structures(s), power lines, communication, signal or other wires, train control system, cellular or data towers, or electrical or electronic apparatus other property, or any appurtenances thereto ("Licensor's Facilities") and any other facilities as now exist or which may in the future be located in, upon, over, under or across the property;

(B) All encumbrances, conditions, covenants, easements, and limitations applicable to Licensor's title to or rights in the subject property; and

(C) Compliance by Licensee with the terms and conditions herein contained;

does hereby license and permit Licensee to construct, maintain, repair, renew, operate, replace, use, alter or change the Facilities at the Encroachment above for the term herein stated, and to remove same upon termination.

1.2 The term Facilities, as used herein, shall include only those structures and ancillary facilities devoted exclusively to the transmission usage above within the Encroachment, and as shown on attached Exhibit A.

1.3 No additional structures or other facilities shall be placed, allowed, or maintained by Licensee in, upon or on the Encroachment except upon prior separate written consent of Licensor.

1.4 The term Licensor Facilities, as used herein shall include Licensor's track(s) structures(s), power lines, communication, signal or other wires, train control system, cellular or data towers, or electrical or electronic apparatus other property, or any appurtenances thereto and any other facilities as now exist or which may in the future be located in, upon, over, under or across the property.

## **2. ENCROACHMENT FEE; TERM:**

2.1 Licensee shall pay Licensor a one-time nonrefundable Encroachment Fee of TEN THOUSAND TWO HUNDRED AND 00/100 U.S. DOLLARS (\$10,200.00) upon execution of this Agreement. Licensee agrees that the Encroachment Fee applies only to the original Licensee under this Agreement. In the event of a successor (by merger, consolidation, reorganization and/or assignment) or if the original Licensee changes its name, then Licensee shall be subject to payment of Licensor's current administrative and document preparation fees for the cost incurred by Licensor in preparing and maintaining this Agreement on a current basis.

2.2 However, Licensee assumes sole responsibility for, and shall pay directly (or reimburse Licensor), any additional annual taxes and/or periodic assessments levied against Licensor or Licensor's property solely on account of said Facilities or Encroachment.

2.3 This Agreement shall terminate as herein provided, but shall also terminate upon: (a) Licensee's cessation of use of the Facilities or Encroachment for the purpose(s) above; (b) removal of the Facilities; (c) subsequent mutual consent; and/or (d) failure of Licensee to complete installation within five (5) years from the effective date of this Agreement.

2.4 In further consideration for the license or right hereby granted, Licensee agrees that Licensor shall not be charged or assessed, directly or indirectly, with any part of the cost of installation of said Facilities and appurtenances, and/or maintenance thereof, or for any public works project of which said Facilities is a part. Licensee agrees that it shall not assess Licensor any stormwater fee associated with such Facilities. Furthermore, Licensee shall be responsible for any stormwater fees assessed by any County or State agency managing such systems.

## **3. CONSTRUCTION, MAINTENANCE AND REPAIRS:**

3.1 Licensee shall construct, maintain, relocate, repair, renew, replace, alter, and/or remove the Facilities, in a prudent, workmanlike manner, using quality materials and complying with any



applicable standard(s) or regulation(s) of Licensor (CSXT Specifications), or Licensee's particular industry, National Electrical Safety Code, or any governmental or regulatory body having jurisdiction over the Encroachment.

3.2 Location and construction of Facilities shall be made strictly in accordance with design(s) and specifications furnished to and approved by Licensor, which approval shall not be unreasonably withheld, and of material(s) and size(s) appropriate for the purpose(s) above recited.

3.3 All of Licensee's work, and exercise of rights hereunder, shall be undertaken at time(s) satisfactory to Licensor, and so as to eliminate or minimize any impact on or interference with the safe use and operation of Licensor's property and appurtenances thereto.

3.4 In the installation, maintenance, repair and/or removal of said Facilities, Licensee shall not use explosives of any type or perform or cause any blasting without the separate express written consent of Licensor. As a condition to such consent, a representative will be assigned by Licensor to monitor blasting, and Licensee shall reimburse Licensor for the entire cost and/or expense of furnishing said monitor.

3.5 Any repairs or maintenance to the Facilities, whether resulting from acts of Licensee, or natural or weather events, which are necessary to protect or facilitate Licensor's use of its property, shall be made by Licensee promptly, but in no event later than thirty (30) days after Licensee has notice as to the need for such repairs or maintenance.

3.6 Licensor, in order to protect or safeguard its property, rail operations, equipment and/or employees from damage or injury, may request immediate repair or renewal of the Facilities, and if the same is not performed, may make or contract to make such repairs or renewals, at the sole risk, cost and expense of Licensee.

3.7 Neither the failure of Licensor to object to any work done, material used, or method of construction or maintenance of said Encroachment, nor any approval given or supervision exercised by Licensor, shall be construed as an admission of liability or responsibility by Licensor, or as a waiver by Licensor of any of the obligations, liability and/or responsibility of Licensee under this Agreement.

3.8 All work on the Encroachment shall be conducted in accordance with Licensor's safety rules and regulations.

3.9 Licensee hereby agrees to reimburse Licensor any loss, cost or expense (including losses resulting from train delays and/or inability to meet train schedules) arising from any failure of Licensee to make repairs or conduct maintenance as required by Section 3.5 above or from improper or incomplete repairs or maintenance to the Facilities or Encroachment.

3.10 In the event it becomes necessary for the Licensee to deviate from the approved Exhibit, Licensee shall seek prior approval from CSXT, or when applicable, an official field representative of CSXT permitted to approve changes, authorizing the necessary field changes and Licensee shall provide CSXT with complete As-Built Drawings of the completed

work. As-Built Drawings shall be submitted to Licensor in either electronic or hard copy form upon the substantial completion of the project and upon Licensor's request.

3.11 In the event of large scale maintenance/construction work to railroad bridges Licensee is required to protect power lines related to Licensee's Facilities with insulated covers or comparable safety devices at their costs during construction/maintenance for safety of railroad employees.

#### **4. PERMITS, LICENSES:**

4.1 Before any work hereunder is performed, or before use of the Encroachment for the contracted purpose, Licensee, at its sole cost and expense, shall obtain all necessary permit(s) (including but not limited to zoning, building, construction, health, safety or environmental matters), letter(s) or certificate(s) of approval. Licensee expressly agrees and warrants that it shall conform and limit its activities to the terms of such permit(s), approval(s) and authorization(s), and shall comply with all applicable ordinances, rules, regulations, requirements and laws of any governmental authority (State, Federal or Local) having jurisdiction over Licensee's activities, including the location, contact, excavation and protection regulations of the Occupational Safety and Health Act (OSHA) (29 CFR 1926.651(b)), et al., and State "One Call" - "Call Before You Dig" requirements.

4.2 Licensee assumes sole responsibility for failure to obtain such permit(s) or approval(s), for any violations thereof, or for costs or expenses of compliance or remedy.

#### **5. MARKING AND SUPPORT:**

5.1 With respect to any subsurface installation or maintenance upon Licensor's property, Licensee, at its sole cost and expense, shall:

- (A) support track(s) and roadbed in a manner satisfactory to Licensor;
- (B) backfill with satisfactory material and thoroughly tamp all trenches to prevent settling of surface of land and roadbed of Licensor; and
- (C) either remove any surplus earth or material from Licensor's property or cause said surplus earth or material to be placed and distributed at location(s) and in such manner Licensor may approve.

5.2 After construction or maintenance of the Facilities, Licensee shall:

- (A) Restore any track(s), roadbed and other disturbed property; and
- (B) Erect, maintain and periodically verify the accuracy of aboveground markers, in a form approved by Licensor, indicating the location, depth and ownership of any underground Facilities or related facilities.

5.3 Licensee shall be solely responsible for any subsidence or failure of lateral or subjacent support in the Encroachment area for a period of three (3) years after completion of installation.

**6. TRACK CHANGES:**

6.1 In the event that rail operations and/or track maintenance result in changes in grade or alignment of, additions to, or relocation of track(s) or other facilities, or in the event future use of Licensor's rail corridor or property necessitate any change of location, height or depth in the Facilities or Encroachment, Licensee, at its sole cost and expense and within thirty (30) days after notice in writing from Licensor, shall make changes in the Facilities or Encroachment to accommodate such track(s) or operations.

6.2 If Licensee fails to do so, Licensor may make or contract to make such changes at Licensee's cost.

**7. FACILITY CHANGES:**

7.1 Licensee shall periodically monitor and verify the depth or height of the Facilities or Encroachment in relation to the existing tracks and facilities, and shall relocate the Facilities or change the Encroachment, at Licensee's expense, should such relocation or change be necessary to comply with the minimum clearance requirements of Licensor.

7.2 If Licensee undertakes to revise, renew, replace, relocate or change in any manner whatsoever all or any part of the Facilities (including any change in voltage or gauge of wire or any change in circumference, diameter or radius of pipe or change in materials transmitted in and through said pipe), or is required by any public agency or court order to do so, plans therefor shall be submitted to Licensor for approval before such change. After approval, which shall not be unreasonably withheld, the terms and conditions of this Agreement shall apply thereto.

**8. INTERFERENCE WITH RAIL FACILITIES:**

8.1 Although the Facilities/Encroachment herein permitted may not presently interfere with Licensor's railroad or facilities, in the event that the operation, existence or maintenance of said Facilities, in the sole judgment of Licensor, causes: (a) interference (including, but not limited to, physical or interference from an electromagnetic induction, or interference from stray or other currents) with Licensor's power lines, communication, signal or other wires, train control system, or electrical or electronic apparatus; or (b) interference in any manner, with the operation, maintenance or use of the rail corridor, track(s), structures, pole line(s), devices, other property, or any appurtenances thereto; then and in either event, Licensee, upon receipt of written notice from Licensor of any such interference, and at Licensee's sole risk, cost and expense, shall promptly make such changes in its Facilities or installation, as may be required in the reasonable judgment of the Licensor to eliminate all such interference. Upon Licensee's failure to remedy or change, Licensor may do so or contract to do so at Licensee's sole cost.

8.2 Without assuming any duty hereunder to inspect the Facilities, Licensor hereby reserves the right to inspect same and to require Licensee to undertake repairs, maintenance or adjustments to the Facilities, which Licensee hereby agrees to make promptly, at Licensee's sole cost and expense.

**9. RISK, LIABILITY, INDEMNITY:**

With respect to the relative risk and liabilities of the parties, it is hereby agreed that:

9.1 To the fullest extent permitted by State law (constitutional or statutory, as amended), Licensee hereby agrees to, defend, indemnify, and hold Licensor harmless from and against any and all liability, loss, claim, suit, damage, charge or expense which Licensor may suffer, sustain, incur or in any way be subjected to, on account of death of or injury to any person whomsoever (including officers, agents, employees or invitees of Licensor), and for damage to or loss of or destruction of any property whatsoever, arising out of, resulting from, or in any way connected with the construction, repair, maintenance, replacement, presence, existence, operations, use or removal of the Facilities or any structure in connection therewith, or restoration of premises of Licensor to good order or condition after removal, EXCEPT when proven to have been caused solely by the willful misconduct or gross negligence of Licensor. HOWEVER, to the fullest extent permitted by State law, during any period of actual construction, repair, maintenance, replacement or removal of the Facilities, wherein agents, equipment or personnel of Licensee are on the railroad rail corridor, Licensee's liability hereunder shall be absolute, irrespective of any joint, sole or contributory fault or negligence of Licensor.

9.2 Use of Licensor's rail corridor involves certain risks of loss or damage as a result of the rail operations. Notwithstanding Section 9.1, Licensee expressly assumes all risk of loss and damage to Licensee's Property or the Facilities in, on, over or under the Encroachment, including loss of or any interference with use or service thereof, regardless of cause, including electrical field creation, fire or derailment resulting from rail operations. For this Section, the term "Licensee's Property" shall include property of third parties situated or placed upon Licensor's rail corridor by Licensee or by such third parties at request of or for benefit of Licensee.

9.3 To the fullest extent permitted by State law, as above, Licensee assumes all responsibility for (a) all claims, costs and expenses, including reasonable attorneys' fees, as a consequence of any sudden or nonsudden pollution of air, water, land and/or ground water on or off the Encroachment area, arising from or in connection with the use of this Encroachment or resulting from leaking, bursting, spilling, or any escape of the material transmitted in or through the Facilities; (b) any claim or liability arising under federal or state law dealing with either such sudden or nonsudden pollution of air, water, land and/or ground water arising therefrom or the remedy thereof; and (c) any subsidence or failure of lateral or subjacent support of the tracks arising from such Facilities leakage.

9.4 Notwithstanding Section 9.1, Licensee also expressly assumes, to the fullest extent permitted by State law, all risk of loss which in any way may result from Licensee's failure to maintain either required clearances for any overhead Facilities or the required depth and encasement for any underground Facilities, whether or not such loss(es) result(s) in whole or part from Licensor's contributory negligence or joint fault.

9.5 Obligations of Licensee hereunder to release shall also extend to companies and other legal entities that control, are controlled by, subsidiaries of, or are affiliated with Licensor, as well as any railroad that operates over the rail corridor on which the Encroachment is located, and the officers, employees and agents of each.

9.6 If a claim is made or action is brought against Licensor, and/or its operating lessee, for which Licensee may be responsible hereunder, in whole or in part, Licensee shall be notified to assume the handling or defense of such claim or action; but Licensor may participate in such handling or defense.

9.7 Notwithstanding anything contained in this Agreement, the limitation of liability contained in the state statutes, as amended from time to time, shall not limit Licensor's ability to collect under the insurance policies required to be maintained under this Agreement.

## **10. INSURANCE:**

10.1 Prior to commencement of surveys, installation or occupation of premises pursuant to this Agreement, Licensee shall procure and shall maintain during the continuance of this Agreement, at its sole cost and expense, a policy of

(i) Statutory Worker's Compensation and Employers Liability Insurance with available limits of not less than ONE MILLION AND 00/100 U.S. DOLLARS (\$1,000,000.00), which must contain a waiver of subrogation against CSXT and its Affiliates;

(ii) Commercial General Liability coverage (inclusive of contractual liability) with available limits of not less than FIVE MILLION AND 00/100 U.S. DOLLARS (\$5,000,000.00), naming Licensor, and/or its designee, as additional insured and in combined single limits for bodily injury and property damage and covering the contractual liabilities assumed under this Agreement. The evidence of insurance coverage shall be endorsed to provide for thirty (30) days' notice to Licensor, or its designee, prior to cancellation or modification of any policy. Mail CGL certificate, along with agreement, to CSX Transportation, Inc., Speed Code J180, 500 Water Street, Jacksonville, FL 32202. On each successive renewal, send updated certificate to [RenewalCOI@csx.com](mailto:RenewalCOI@csx.com).

(iii) Business automobile liability insurance with available limits of not less than ONE MILLION AND 00/100 U.S. DOLLARS (\$1,000,000.00) combined single limit for bodily injury and/or property damage per occurrence;

(iv) Such other insurance as Licensor may reasonably require.

10.2 If Licensee's existing CGL policy(ies) do(es) not automatically cover Licensee's contractual liability during periods of survey, installation, maintenance and continued occupation, a specific endorsement adding such coverage shall be purchased by Licensee. If said CGL policy is written on a "claims made" basis instead of a "per occurrence" basis, Licensee shall arrange for adequate time for reporting losses. Failure to do so shall be at Licensee's sole risk.

10.3 Licenser, or its designee, may at any time request evidence of insurance purchased by Licensee to comply with this Agreement. Failure of Licensee to comply with Licenser's request shall be considered a default by Licensee.

10.4 Securing such insurance shall not limit Licensee's liability under this Agreement, but shall be security therefor.

10.5 (A) In the event Licensee finds it necessary to perform construction or demolition operations within fifty feet (50') of any operated railroad track(s) or affecting any railroad bridge, trestle, tunnel, track(s), roadbed, overpass or underpass, Licensee shall: (a) notify Licenser; and (b) require its contractor(s) performing such operations to procure and maintain during the period of construction or demolition operations, at no cost to Licenser, Railroad Protective Liability (RPL) Insurance, naming Licenser, and/or its designee, as Named Insured, written on the current ISO/RIMA Form (ISO Form No. CG 00 35 01 96) with limits of FIVE MILLION AND 00/100 U.S. DOLLARS (\$5,000,000.00) per occurrence for bodily injury and property damage, with at least TEN MILLION AND 00/100 U.S. DOLLARS (\$10,000,000.00) aggregate limit per annual policy period, with Pollution Exclusion Amendment (ISO CG 28 31 11 85) if an older ISO Form CG 00 35 is used. The original of such RPL policy shall be sent to and approved by Licenser prior to commencement of such construction or demolition. Licenser reserves the right to demand higher limits if reasonably required.

(B) At Licenser's option, in lieu of purchasing RPL insurance from an insurance company (but not CGL insurance), Licensee may pay Licenser, at Licenser's current rate at time of request, the cost of adding this Encroachment, or additional construction and/or demolition activities, to Licenser's Railroad Protective Liability (RPL) Policy for the period of actual construction. This coverage is offered at Licenser's discretion and may not be available under all circumstances.

10.6 Notwithstanding the provisions of Sections 10.1 and 10.2, Licensee, pursuant to State Statute(s), may self-insure or self-assume, in any amount(s), any contracted liability arising under this Agreement, under a funded program of self-insurance, which fund will respond to liability of Licensee imposed by and in accordance with the procedures established by law.

## **11. GRADE CROSSINGS; FLAGGING:**

11.1 Nothing herein contained shall be construed to permit Licensee or Licensee's contractor to move any vehicles or equipment over the track(s), except at public road crossing(s), without separate prior written approval of Licenser.

11.2 If Licensor deems it advisable, during any construction, maintenance, repair, renewal, replacement, alteration, change or removal of said Facilities, to place watchmen, flagmen, inspectors or supervisors for protection of operations of Licensor or others on Licensor's rail corridor at the Encroachment, and to keep persons, equipment or materials away from the track(s), Licensor shall have the right to do so at the expense of Licensee, but Licensor shall not be liable for failure to do so.

**12. LICENSOR'S COSTS:**

12.1 Any additional or alternative costs or expenses incurred by Licensor to accommodate Licensee's continued use of Licensor's property as a result of track changes or wire changes shall also be paid by Licensee.

12.2 Licensor's expense for wages ("force account" charges) and materials for any work performed at the expense of Licensee pursuant hereto shall be paid by Licensee within thirty (30) days after receipt of Licensor's bill therefor. Licensor may, at its discretion, request an advance deposit for estimated Licensor costs and expenses.

12.3 Such expense shall include, but not be limited to, cost of railroad labor and supervision under "force account" rules, plus current applicable overhead percentages, the actual cost of materials, and insurance, freight and handling charges on all material used. Equipment rentals shall be in accordance with Licensor's applicable fixed rate. Licensor may, at its discretion, require advance deposits for estimated costs of such expenses and costs.

**13. DEFAULT, BREACH, WAIVER:**

13.1 The proper and complete performance of each covenant of this Agreement shall be deemed of the essence thereof, and in the event Licensee fails or refuses to fully and completely perform any of said covenants or remedy any breach within thirty (30) days after receiving written notice from Licensor to do so (or within forty-eight (48) hours in the event of notice of a railroad emergency), Licensor shall have the option of immediately revoking this Agreement and the privileges and powers hereby conferred, regardless of encroachment fee(s) having been paid in advance for any annual or other period. Upon such revocation, Licensee shall make removal in accordance with Article 14.

13.2 No waiver by Licensor of its rights as to any breach of covenant or condition herein contained shall be construed as a permanent waiver of such covenant or condition, or any subsequent breach thereof, unless such covenant or condition is permanently waived in writing by Licensor.

13.3 Neither the failure of Licensor to object to any work done, material used, or method of construction or maintenance of said Encroachment, nor any approval given or supervision exercised by Licensor, shall be construed as an admission of liability or responsibility by Licensor, or as a waiver by Licensor of any of the obligations, liability and/or responsibility of Licensee under this Agreement.

**14. TERMINATION, REMOVAL:**

14.1 All rights which Licensee may have hereunder shall cease upon the date of (a) termination, (b) revocation, or (c) subsequent agreement, or (d) Licensee's removal of the Facility from the Encroachment. However, neither termination nor revocation of this Agreement shall affect any claims and liabilities which have arisen or accrued hereunder, and which at the time of termination or revocation have not been satisfied; neither party, however, waiving any third party defenses or actions.

14.2 Within thirty (30) days after revocation or termination, Licensee, at its sole risk and expense, shall (a) remove the Facilities from the rail corridor of Licensor, unless the parties hereto agree otherwise, (b) restore the rail corridor of Licensor in a manner satisfactory to Licensor, and (c) reimburse Licensor any loss, cost or expense of Licensor resulting from such removal.

**15. NOTICE:**

15.1 Licensee shall give Licensor at least thirty (30) days written notice before doing any work on Licensor's rail corridor, except that in cases of emergency shorter notice may be given. Licensee shall provide proper notification as follows:

a. For non-emergencies, Licensee shall submit online via the CSX Property Portal from Licensor's web site, via web link:  
[https://propertyportal.csx.com/pub\\_ps\\_res/ps\\_res/jsf/public/index.faces](https://propertyportal.csx.com/pub_ps_res/ps_res/jsf/public/index.faces)

b. For emergencies, Licensee shall complete all of the steps outlined in Section 15.1 a. above, and shall also include detailed information of the emergency. Licensee shall also call and report details of the emergency to Licensor's Rail Operations Emergency Telephone Number: 1-800-232-0144. In the event Licensor needs to contact Licensee concerning an emergency involving Licensee's Facility(ies), the emergency phone number for Licensee is: 704-283-3867.

15.2 All other notices and communications concerning this Agreement shall be addressed to Licensee at the address above, and to Licensor at the address shown on Page 1, c/o CSXT Contract Management, J180; or at such other address as either party may designate in writing to the other.

15.3 Unless otherwise expressly stated herein, all such notices shall be in writing and sent via Certified or Registered Mail, Return Receipt Requested, or by courier, and shall be considered delivered upon: (a) actual receipt, or (b) date of refusal of such delivery.

**16. ASSIGNMENT:**

16.1 The rights herein conferred are the privileges of Licensee only, and Licensee shall obtain Licensor's prior written consent to any assignment of Licensee's interest herein; said consent shall not be unreasonably withheld.



16.2 Subject to Sections 2 and 16.1, this Agreement shall be binding upon and inure to the benefit of the parties hereto and their respective successors or assigns.

16.3 Licensee shall give Licensor written notice of any legal succession (by merger, consolidation, reorganization, etc.) or other change of legal existence or status of Licensee, with a copy of all documents attesting to such change or legal succession, within thirty (30) days thereof.

16.4 Licensor expressly reserves the right to assign this Agreement, in whole or in part, to any grantee, lessee, or vendee of Licensor's underlying property interests in the Encroachment, upon written notice thereof to Licensee.

16.5 In the event of any unauthorized sale, transfer, assignment, sublicense or encumbrance of this Agreement, or any of the rights and privileges hereunder, Licensor, at its option, may revoke this Agreement by giving Licensee or any such assignee written notice of such revocation; and Licensee shall reimburse Licensor for any loss, cost or expense Licensor may incur as a result of Licensee's failure to obtain said consent.

**17. TITLE:**

17.1 Licensee understands that Licensor occupies, uses and possesses lands, rights-of-way and rail corridors under all forms and qualities of ownership rights or facts, from full fee simple absolute to bare occupation. Accordingly, nothing in this Agreement shall act as or be deemed to act as any warranty, guaranty or representation of the quality of Licensor's title for any particular Encroachment or segment of Rail Corridor occupied, used or enjoyed in any manner by Licensee under any rights created in this Agreement. It is expressly understood that Licensor does not warrant title to any Rail Corridor and Licensee will accept the grants and privileges contained herein, subject to all lawful outstanding existing liens, mortgages and superior rights in and to the Rail Corridor, and all leases, licenses and easements or other interests previously granted to others therein.

17.2 The term "license," as used herein, shall mean with regard to any portion of the Rail Corridor which is owned by Licensor in fee simple absolute, or where the applicable law of the State where the Encroachment is located otherwise permits Licensor to make such grants to Licensee, a "permission to use" the Rail Corridor, with dominion and control over such portion of the Rail Corridor remaining with Licensor, and no interest in or exclusive right to possess being otherwise granted to Licensee. With regard to any other portion of Rail Corridor occupied, used or controlled by Licensor under any other facts or rights, Licensor merely waives its exclusive right to occupy the Rail Corridor and grants no other rights whatsoever under this Agreement, such waiver continuing only so long as Licensor continues its own occupation, use or control. Licensor does not warrant or guarantee that the license granted hereunder provides Licensee with all of the rights necessary to occupy any portion of the Rail Corridor. Licensee further acknowledges that it does not have the right to occupy any portion of the Rail Corridor held by Licensor in less than fee simple absolute without also receiving the consent of the

owner(s) of the fee simple absolute estate. Further, Licensee shall not obtain, exercise or claim any interest in the Rail Corridor that would impair Licensor's existing rights therein.

17.3 Licensee agrees it shall not have nor shall it make, and hereby completely and absolutely waives its right to, any claim against Licensor for damages on account of any deficiencies in title to the Rail Corridor in the event of failure or insufficiency of Licensor's title to any portion thereof arising from Licensee's use or occupancy thereof.

17.4 Licensee, to the fullest extent permitted by State law (constitutional or statutory, as amended) agrees to fully and completely indemnify and defend all claims or litigation for slander of title, overburden of easement, or similar claims arising out of or based upon the Facilities placement, or the presence of the Facilities in, on or along any Encroachment(s), including claims for punitive or special damages.

17.5 Licensee shall not at any time own or claim any right, title or interest in or to Licensor's property occupied by the Encroachments, nor shall the exercise of this Agreement for any length of time give rise to any right, title or interest in Licensee to said property other than the license herein created.

17.6 Nothing in this Agreement shall be deemed to give, and Licensor hereby expressly waives, any claim of ownership in and to any part of the Facilities.

17.7 Licensee shall not create or permit any mortgage, pledge, security, interest, lien or encumbrances, including without limitation, tax liens and liens or encumbrances with respect to work performed or equipment furnished in connection with the construction, installation, repair, maintenance, renewal, replacement, or operation of the Facilities in or on any portion of the Encroachment (collectively, "Liens or Encumbrances"), to be established or remain against the Encroachment or any portion thereof or any other Licensor property.

17.8 In the event that any property of Licensor becomes subject to such Liens or Encumbrances, Licensee agrees to pay, discharge or remove the same promptly upon Licensee's receipt of notice that such Liens or Encumbrances have been filed or docketed against the Encroachment or any other property of Licensor; however, Licensee reserves the right to challenge, at its sole expense, the validity and/or enforceability of any such Liens or Encumbrances.

## **18. GENERAL PROVISIONS:**

18.1 This Agreement, and the attached specifications, contains the entire understanding between the parties hereto.

18.2 Neither this Agreement, any provision hereof, nor any agreement or provision included herein by reference, shall operate or be construed as being for the benefit of any third person.

18.3 Except as otherwise provided herein, or in any Rider attached hereto, neither the form of this Agreement, nor any language herein, shall be interpreted or construed in favor of or against either party hereto as the sole drafter thereof.

18.4 This Agreement is executed under current interpretation of applicable Federal, State, County, Municipal or other local statute, ordinance or law(s). However, each separate division (paragraph, clause, item, term, condition, covenant or agreement) herein shall have independent and severable status for the determination of legality, so that if any separate division is determined to be void or unenforceable for any reason, such determination shall have no effect upon the validity or enforceability of each other separate division, or any combination thereof.

18.5 This Agreement shall be construed and governed by the laws of the state in which the Facilities and Encroachment are located.

18.6 If any amount due pursuant to the terms of this Agreement is not paid by the due date, it will be subject to Licensor's standard late charge and will also accrue interest at eighteen percent (18%) per annum, unless limited by local law, and then at the highest rate so permitted.

18.7 Licensee agrees to reimburse Licensor for all reasonable costs (including attorney's fees) incurred by Licensor for collecting any amount due under the Agreement.

18.8 The provisions of this License are considered confidential and may not be disclosed to a third party without the consent of the other party(s), except: (a) as required by statute, regulation or court order, (b) to a parent, affiliate or subsidiary company, (c) to an auditing firm or legal counsel that are agreeable to the confidentiality provisions, or (d) to Lessees of Licensor's land and/or track who are affected by the terms and conditions of this Agreement and will maintain the confidentiality of this Agreement. Notwithstanding anything herein to the contrary, Licensor acknowledges and agrees that Licensee is subject to Chapter 132 of the North Carolina General Statutes, the Public Records Act, and that this Agreement, including all documents attached or incorporated herein by reference, shall be a public record as defined in such Act, and as such, will be open to public disclosure and copying.

18.9 Within thirty (30) days of an overpayment in a cumulative total amount of One Hundred Dollars (\$100.00) or more by Licensee to Licensor, Licensee shall notify Licensor in writing with documentation evidencing such overpayment. Licensor shall refund the actual amount of Licensee's overpayment within 120 days of Licensor's verification of such overpayment.

18.10 E-Verify is the federal program operated by the United States Department of Homeland Security and other federal agencies, or any successor or equivalent program, used to verify the work authorization of newly hired employees pursuant to federal law. Licensor shall ensure that Licensor and any subcontractors performing work under this Agreement: (i) uses E-Verify if required to do so by North Carolina law; and (ii) otherwise complies with the requirements of Article 2 of Chapter 64 of the North Carolina General Statutes.

18.11 This Agreement may be executed in any number of counterparts, and such counterparts may be exchanged by electronic transmission. Upon execution by the parties hereto, each counterpart shall be deemed an original and together shall constitute one and the same instrument. A fully executed copy of this Agreement by electronic transmission shall be deemed to have the same legal effect as delivery of an original executed copy of this Agreement for all purposes.

**[Signatures on the following page]**

IN WITNESS WHEREOF, the parties hereto have executed this Agreement in duplicate (each of which shall constitute an original) as of the effective date of this Agreement.

**Witness for Licensor:**

**CSX TRANSPORTATION, INC.**

\_\_\_\_\_

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

Print/Type Name: \_\_\_\_\_

Print/Type Title: \_\_\_\_\_

**Witness for Licensee:**

**UNION COUNTY**

\_\_\_\_\_

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

Who, by the execution hereof, affirms that he/she has the authority to do so and to bind the Licensee to the terms and conditions of this Agreement.

Print/Type Name: \_\_\_\_\_

Print/Type Title: \_\_\_\_\_

Tax ID No.: \_\_\_\_\_



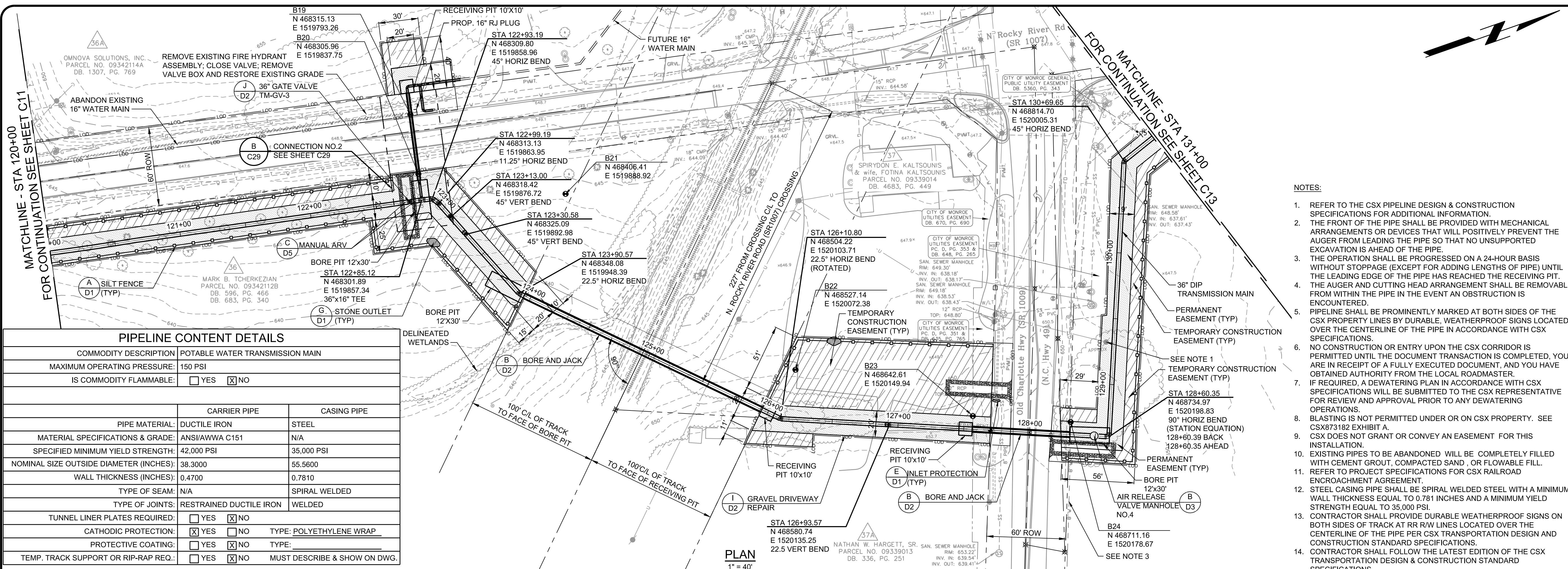
# CSX873182 EXHIBIT A

## CSX GENERAL NOTES:

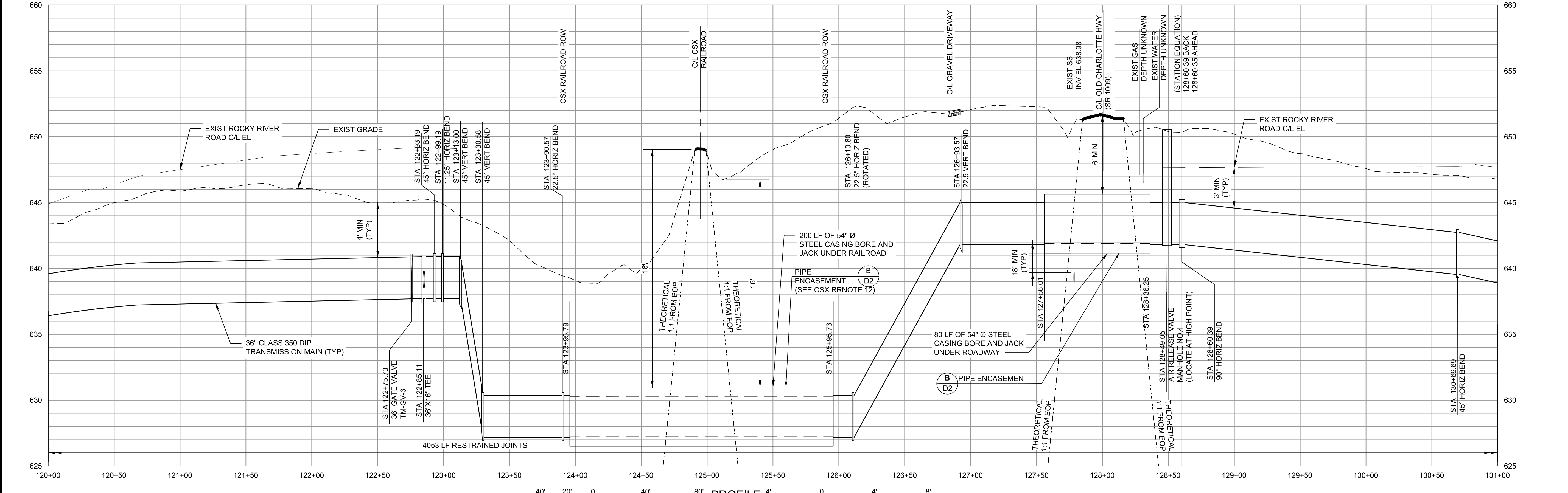
1. REFER TO THE CSX PIPELINE DESIGN & CONSTRUCTION SPECIFICATIONS FOR ADDITIONAL INFORMATION.
2. THE FRONT OF THE PIPE SHALL BE PROVIDED WITH MECHANICAL ARRANGEMENTS OR DEVICES THAT WILL POSITIVELY PREVENT THE AUGER FROM LEADING THE PIPE SO THAT NO UNSUPPORTED EXCAVATION IS AHEAD OF THE PIPE.
3. THE OPERATION SHALL BE PROGRESSED ON A 24-HOUR BASIS WITHOUT STOPPAGE (EXCEPT FOR ADDING LENGTHS OF PIPE) UNTIL THE LEADING EDGE OF THE PIPE HAS REACHED THE RECEIVING PIT.
4. THE AUGER AND CUTTING HEAD ARRANGEMENT SHALL BE REMOVABLE FROM WITHIN THE PIPE IN THE EVENT AN OBSTRUCTION IS ENCOUNTERED.
5. PIPELINE SHALL BE PROMINENTLY MARKED AT BOTH SIDES OF THE CSX PROPERTY LINES BY DURABLE, WEATHERPROOF SIGNS LOCATED OVER THE CENTERLINE OF THE PIPE IN ACCORDANCE WITH CSX SPECIFICATIONS.
6. NO CONSTRUCTION OR ENTRY UPON THE CSX CORRIDOR IS PERMITTED UNTIL THE DOCUMENT TRANSACTION IS COMPLETED, YOU ARE IN RECEIPT OF A FULLY EXECUTED DOCUMENT, AND YOU HAVE OBTAINED AUTHORITY FROM THE LOCAL ROADMASTER.
7. IF REQUIRED, A DEWATERING PLAN IN ACCORDANCE WITH CSX SPECIFICATIONS WILL BE SUBMITTED TO THE CSX REPRESENTATIVE FOR REVIEW AND APPROVAL PRIOR TO ANY DEWATERING OPERATIONS. CSX PROHIBITS THE DISCHARGE OF WATER ONTO ITS PROPERTY WITHOUT PRIOR APPROVAL.
8. BLASTING IS NOT PERMITTED UNDER OR ON CSX PROPERTY.
9. CSX DOES NOT GRANT OR CONVEY AN EASEMENT FOR THIS INSTALLATION.
10. EXISTING PIPES TO BE ABANDONED WILL BE COMPLETELY FILLED WITH CEMENT GROUT OR COMPACTED SAND.
11. PROJECTS THAT GENERATE SOILS FROM CSX PROPERTY MUST ADHERE TO CSX'S SOIL MANAGEMENT POLICIES. CSX REQUIRES SOILS GENERATED FROM ITS PROPERTY TO EITHER BE PROPERLY DISPOSED IN A CSX APPROVED DISPOSAL FACILITY OR REUSED ON CSX PROPERTY. THE MANAGEMENT OF SOILS GENERATED FROM CSX PROPERTY SHOULD BE PLANNED FOR AND PROPERLY PERMITTED (IF APPLICABLE) PRIOR TO INITIATING ANY WORK ON CSX PROPERTY.
12. USE OF CONSTRUCTION SAFETY FENCING IS REQUIRED WHEN A CSX FLAGMAN IS NOT PRESENT. DISTANCE OF SAFETY FENCE FROM NEAREST RAIL TO BE DETERMINED BY CSX ROADMASTER AND WILL BE REMOVED UPON COMPLETION OF PROJECT.

CSX PROPERTY SERVICES REVIEW	
<input checked="" type="checkbox"/> No Exceptions	<input type="checkbox"/> Exceptions Noted
<small>This review is for the general conformance with CSX utility design specifications only. Sole responsibility for all aspects of the overall design shall remain with the facility owner. This review does not constitute approval to proceed without meeting all of CSX's safety and contractual requirements.</small>	
By: <u>THOMAS PAULY</u>	





PIPELINE CONTENT DETAILS		
COMMODITY DESCRIPTION	POTABLE WATER TRANSMISSION MAIN	
MAXIMUM OPERATING PRESSURE:	150 PSI	
IS COMMODITY FLAMMABLE:	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	
PIPE MATERIAL:	CARRIER PIPE	CASING PIPE
MATERIAL SPECIFICATIONS & GRADE:	DUCTILE IRON	STEEL
SPECIFIED MINIMUM YIELD STRENGTH:	ANSI/AWWA C151	N/A
NOMINAL SIZE OUTSIDE DIAMETER (INCHES):	42,000 PSI	35,000 PSI
WALL THICKNESS (INCHES):	38.3000	55.5600
TYPE OF SEAM:	0.4700	0.7810
TYPE OF JOINTS:	N/A	SPIRAL WELDED
TUNNEL LINER PLATES REQUIRED:	RESTRAINED DUCTILE IRON	WELDED
CATHODIC PROTECTION:	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	TYPE: POLYETHYLENE WRAP
PROTECTIVE COATING:	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	TYPE:
TEMP. TRACK SUPPORT OR RIP-RAP REQ.:	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	MUST DESCRIBE & SHOW ON DWG.



- NOTES:**
- REFER TO THE CSX PIPELINE DESIGN & CONSTRUCTION SPECIFICATIONS FOR ADDITIONAL INFORMATION.
  - THE FRONT OF THE PIPE SHALL BE PROVIDED WITH MECHANICAL ARRANGEMENTS OR DEVICES THAT WILL POSITIVELY PREVENT THE AUGER FROM LEADING THE PIPE SO THAT NO UNSUPPORTED EXCAVATION IS AHEAD OF THE PIPE.
  - THE OPERATION SHALL BE PROGRESSED ON A 24-HOUR BASIS WITHOUT STOPPAGE (EXCEPT FOR ADDING LENGTHS OF PIPE) UNTIL THE LEADING EDGE OF THE PIPE HAS REACHED THE RECEIVING PIT. THE AUGER AND CUTTING HEAD ARRANGEMENT SHALL BE REMOVABLE FROM WITHIN THE PIPE IN THE EVENT AN OBSTRUCTION IS ENCOUNTERED.
  - PIPELINE SHALL BE PROMINENTLY MARKED AT BOTH SIDES OF THE CSX PROPERTY LINES BY DURABLE, WEATHERPROOF SIGNS LOCATED OVER THE CENTERLINE OF THE PIPE IN ACCORDANCE WITH CSX SPECIFICATIONS.
  - NO CONSTRUCTION OR ENTRY UPON THE CSX CORRIDOR IS PERMITTED UNTIL THE DOCUMENT TRANSACTION IS COMPLETED, YOU ARE IN RECEIPT OF A FULLY EXECUTED DOCUMENT, AND YOU HAVE OBTAINED AUTHORITY FROM THE LOCAL ROADMASTER.
  - IF REQUIRED, A DEWATERING PLAN IN ACCORDANCE WITH CSX SPECIFICATIONS WILL BE SUBMITTED TO THE CSX REPRESENTATIVE FOR REVIEW AND APPROVAL PRIOR TO ANY DEWATERING OPERATIONS.
  - BLASTING IS NOT PERMITTED UNDER OR ON CSX PROPERTY. SEE CSX873182 EXHIBIT A.
  - CSX DOES NOT GRANT OR CONVEY AN EASEMENT FOR THIS INSTALLATION.
  - EXISTING PIPES TO BE ABANDONED WILL BE COMPLETELY FILLED WITH CEMENT GROUT, COMPACTED SAND, OR FLOWABLE FILL.
  - REFER TO PROJECT SPECIFICATIONS FOR CSX RAILROAD ENCROACHMENT AGREEMENT.
  - STEEL CASING PIPE SHALL BE SPIRAL WELDED STEEL WITH A MINIMUM WALL THICKNESS EQUAL TO 0.781 INCHES AND A MINIMUM YIELD STRENGTH EQUAL TO 35,000 PSI.
  - CONTRACTOR SHALL PROVIDE DURABLE WEATHERPROOF SIGNS ON BOTH SIDES OF TRACK AT RR R/W LINES LOCATED OVER THE CENTERLINE OF THE PIPE PER CSX TRANSPORTATION DESIGN AND CONSTRUCTION STANDARD SPECIFICATIONS.
  - CONTRACTOR SHALL FOLLOW THE LATEST EDITION OF THE CSX TRANSPORTATION DESIGN & CONSTRUCTION STANDARD SPECIFICATIONS.

NO. BY CHK/APP  
REVISIONS AND RECORD OF USE  
DATE

SEAL  
039150  
WILLIAM STOUT  
NORTH CAROLINA  
PROFESSIONAL  
ENGINEER

**BLACK & VEATCH**  
Black & Veatch International Company  
Business License No. F-0794  
10925 David Taylor Drive, Suite 280  
Charlotte, North Carolina 28262

**UNION COUNTY PUBLIC WORKS**  
853W ZONE IMPROVEMENTS  
PHASE I TRANSMISSION MAINS

CIVIL  
PLAN AND PROFILE  
STA 120+00 TO STA 131+00

DESIGNED: MLT, WPS  
DETAILED: KTH  
CHECKED:  
APPROVED:  
DATE: AUGUST 2020

0 1/2 1  
IF THIS BAR DOES NOT  
MEASURE 1" THEN DRAWING  
IS NOT TO FULL SCALE

PROJECT NO.  
186110

**C12**  
SHEET  
16 OF 41

PERMIT SET - NOT FOR CONSTRUCTION



# CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY)

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

**IMPORTANT:** If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

<p><b>PRODUCER</b></p>	<p><b>CONTACT NAME:</b></p> <p><b>PHONE (A/C No. Ext):</b> _____ <b>FAX (A/C No.):</b> _____</p> <p><b>E-MAIL ADDRESS:</b> patty.muncy@reaganinsurance.com</p>
<p><b>INSURED</b></p>	<p><b>INSURER(S) AFFORDING COVERAGE</b></p> <p><b>INSURER A:</b> _____ <b>NAIC #</b> _____</p> <p><b>INSURER B:</b> _____</p> <p><b>INSURER C:</b> _____</p> <p><b>INSURER D:</b> _____</p> <p><b>INSURER E:</b> _____</p> <p><b>INSURER F:</b> _____</p>

The Licensee/Lessee/Industry identified in the agreement must be the named insured. CSXT will not accept the contractor's CGL certificate.

**COVERAGES**                      **CERTIFICATE NUMBER:** \_\_\_\_\_                      **REVISION NUMBER:** \_\_\_\_\_

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDC INSR	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS
A	<p><b>GENERAL LIABILITY</b></p> <p><input checked="" type="checkbox"/> COMMERCIAL GENERAL LIABILITY</p> <p><input type="checkbox"/> CLAIMS-MADE <input checked="" type="checkbox"/> OCCUR</p> <p>GEN'L AGGREGATE LIMIT APPLIES PER:</p> <p><input type="checkbox"/> POLICY <input type="checkbox"/> PROJECT <input type="checkbox"/> LOC</p>	X					<p>EACH OCCURRENCE \$ _____</p> <p>CLAIMS-MADE/PRINTED PREMISES (Ea occurrence) \$ _____</p> <p>MED EXP (Any one person) \$ _____</p> <p>PERSONAL &amp; ADV INJURY \$ _____</p> <p>GENERAL AGGREGATE \$ _____</p> <p>PRODUCTS - COMP/OP AGG \$ _____</p>
	<p><b>AUTOMOBILE LIABILITY</b></p> <p><input type="checkbox"/> ANY AUTO</p> <p><input type="checkbox"/> ALL OWNED AUTOS</p> <p><input type="checkbox"/> HIRED AUTOS</p> <p><input type="checkbox"/> SCHEDULED AUTOS</p> <p><input type="checkbox"/> NON-OWNED AUTOS</p>	X					<p>COMBINED SINGLE LIMIT (Ea accident) \$ _____</p> <p>BODILY INJURY (Per person) \$ _____</p> <p>BODILY INJURY (Per accident) \$ _____</p> <p>PROPERTY DAMAGE (Per accident) \$ _____</p>
	<p><b>UMBRELLA LIAB</b> <input type="checkbox"/> OCCUR</p> <p><b>EXCESS LIAB</b> <input type="checkbox"/> CLAIMS-MADE</p> <p>DED _____ RETENTION \$ _____</p>						<p>EACH OCCURRENCE \$ _____</p> <p>AGGREGATE \$ _____</p>
	<p><b>WORKERS COMPENSATION AND EMPLOYERS' LIABILITY</b></p> <p>ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? (Mandatory in NH) <input type="checkbox"/></p> <p>If yes, describe under DESCRIPTION OF OPERATIONS below</p>		X				<p>WC STATUTORY LIMITS _____ OTHER _____</p> <p>E.L. EACH ACCIDENT \$ _____ X</p> <p>E.L. DISEASE - EA EMPLOYEE \$ _____</p> <p>E.L. DISEASE - POLICY LIMIT \$ _____</p>

The amount in this "Each Occurrence" box must be at least five million dollars (\$5,000,000); or the amount in the box combined with the "Each Occurrence" coverage of any Excess Liability must be at least five million dollars (\$5,000,000)

Combined single limit of not less than one million dollars (\$1,000,000.00)

Standard limits of liability. Must contain a waiver of subrogation in favor of CSXT \$1,000,000.00 per occurrence

**DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (Attach ACORD 101, Additional Remarks Schedule, if more space is required)**

This box should contain the following: CSX Transportation, Inc., is included as additional insured. This certificate applies to all contracts/agreements between the named Insured and CSXT.

**CERTIFICATE HOLDER**                      **CANCELLATION**

CSX Transportation, Inc.  
500 Water Street, J180  
Jacksonville, FL 32202

Per the terms of the agreement this should state: Should any of the above described policies be modified, cancelled, or not renewed, the issuing insurer shall mail 30 days written notice to the certificate holder named herein.



# **APPENDIX G – City of Monroe Utility Encroachment Agreement**



## UCPW Transmission Main – Rocky River Rd & Secrest Short Cut

### SPECIAL PROVISIONS AND INSTRUCTIONS

1. Contact the Engineering Department at (704) 282-4515 at least 48 hours prior to construction. Failure to notify may result in any backfill and patch work having to be re-done to verify compaction.
2. Notify the Engineering Department in writing upon completion to coordinate a final inspection.
3. The City does not guarantee the right-of-way on Westwood Industrial Dr, Union Power Way, Aeropointe Pkwy, James Hamilton Rd, Chatterleigh Dr or Myers Rd nor will it be responsible for any claim for damages brought about by any property owner by reason of this installation.
4. Proper traffic control devices, signs, etc., in accordance with the Manual on Uniform Traffic Control Devices shall be utilized to ensure public safety.
5. Backfill within the right of way (streets, shoulders, sidewalks) will be placed in 6” lifts and meet the following requirements:
  - Streets – 95% compaction from bottom of trench to 1 ft below subgrade  
100% compaction from 1 ft below subgrade to subgrade
  - Shoulders – 95% compaction from bottom of trench to subgrade
  - Sidewalk – 95% compaction from bottom of trench to subgrade
6. A copy of the approved Encroachment Agreement and Special Provisions and Instructions must be maintained on site.
7. All materials and workmanship shall conform to the City of Monroe Standard Specifications and Detail Manual.
8. The City Engineering Department reserves the right to require the Contractor to employ the services of a Geotechnical firm to run density test and to certify the compaction of the backfill material.
9. No open trenches shall be left overnight.
10. Contractor shall call NC One Call at 811 at least 72 hours in advance before initiating any excavation activities for utility locations with special attention being paid to hand dig zones. Contractor shall maintain locates throughout the life of the project. Please note notification timeframe does not begin until midnight of the day the locate is requested.
11. Proper temporary and permanent measures shall be used to control erosion and sedimentation in accordance with all local, State, and Federal regulations.
12. Complete restoration including fertilizing, seeding, and mulching shall be established on all disturbed areas.
13. Contractor shall maintain a minimum of one-foot clearance (both vertical and horizontal) between existing storm drainage system (pipes, drainage structures, and culverts) and proposed utility.

- There is an existing 72" CMP running across Rocky River Road near driveway of 1018 N Rocky River Road.
- There is an existing 18" RCP running across Rocky River Road near driveway of 1122 N Rocky River Road.
- There is an existing 24" RCP running across Rocky River Road near 1318 Rocky River Road.
- There is an existing 15" RCP running across Rocky River Road near the driveway of 1322 Rocky River Road.
- There is an existing 36" RCP running across Rocky River Road between 1322 Rocky River Road and 1402 Rocky River Road.
- There is an existing 15" RCP running across Rocky River Road in front of 1419 Rocky River Road.
- There is an existing 15" RCP running across Rocky River Road in front of 1522 Rocky River Road.
- There is an existing 15" RCP running across Rocky River Road near the driveways of 1610 Rocky River Road.
- There is an existing 18" RCP and (2) 12" RCP running across Aeropointe Pkwy.
- There is an existing 18" RCP running across Rocky River Road near the front right corner of 1803 Rocky River Road.
- There is an existing 66" CMP running across Rocky River Road at creek.
- There is an existing 18" RCP running across Rocky River Road at the back corner of 3702 Old Charlotte Hwy.
- There is an existing 72" CMP running across Rocky River Road at creek
- There is an existing 24" RCP running across Rocky River Road at 2318 Rocky River Road.
- There is an existing 24" RCP running across Hwy 74 at the driveway of 4000 Hwy 74.
- There is an existing 18" CMP running across the driveway at 4000 Hwy 74.
- There is an existing 18" RCP running across Rocky River Road near the driveway of 2855 N Rocky River Road.
- There is an existing 96" RCP running across Rocky River Road at the right corner of 2811 N Rocky River Road.
- There is an existing 48" RCP running across Rocky River Road from back corner of lot of 4100 John Stevenson Lane to the back of 2813 Way Cross Drive.
- There is an existing 18" RCP running across Rocky River Road near the driveway of 3115 N Rocky River Road.
- There is an existing 42" RCP running across Rocky River Road at creek.
- There is an existing 30" RCP running across Rocky River Road at the driveway of 3223 N Rocky River Road.
- There is an existing 18" CMP running across Myers Road at the intersection of N Rocky River Road.
- There is an existing 24" RCP running across Secrest Short Cut at the corner of 5205 Secrest Short Cut.
- There is an existing 24" RCP running across Secrest Short Cut at creek at 5303 Secrest Short Cut.

- There is an existing 15” RCP running across Secret Shor Cut at front left corner of 5306 Secret Short Cut.

### **Additional Provisions Provided by Energy Services Department**

#### Electric

- Call 811 - NC One Call for utility locations with special attention being paid to hand dig zones. For boring activities, please make sure to perform the work per the North Carolina Damage Prevention Law requirements.
- All crossing of City of Monroe underground cable shall be dug (by vacuum or shovel) to prevent cross boring. There shall be, at a minimum, a two (2) ft. separation from all electric lines, vertically for crossings and horizontally for paralleling. A minimum of three (3) feet of separation is required around pad mounted transformers, handboxes, and poles. During the crossings of electric lines, an inspector from the City of Monroe Electric Department shall be onsite. Please give a 48 hour notice to schedule inspector by contacting Eric Howell at 704-282-4609.
- For overhead power lines along the route. Contractors should be observant while using equipment with boom arms in the vicinity of electric overhead. No equipment allowed within 10’ of overhead power lines per OSHA 1926.1408 unless OSHA 1926.1408 and 1926.1410 regulation requirements are met.
- Avoid installation below existing power poles. If in the future it is discovered that the installation of the utilities under existing poles, the City of Monroe will not be responsible for damage to the facility during pole change outs at the same location.

#### Gas

- Call 811 - NC One Call for utility locations with special attention being paid to hand dig zones. For boring activities, please make sure to perform the work per the North Carolina Damage Prevention Law requirements.
- All natural gas pipeline crossings of mains and services shall be exposed (by vacuum or shovel) to prevent cross boring. There shall be, at a minimum, a two (2) ft. separation from all gas main and services, vertically for crossings and horizontally for paralleling. Maintain greater separation than two (2) ft. at all locations possible. During the crossings of a gas main, an inspector from the City of Monroe Natural Gas Department shall be onsite. Please give a 48 hour notice to schedule inspector by contacting Russ Isom at 704-282-5787.
- For any cathodic protection concerns, please contact Mr. Darwin De Los Santos 704-282-4697.

### **Additional Provisions Provided by Water Resources Department**

1. The City has various existing water and sewer facilities in and around the intersections within the scope of the encroachment application and as shown in the associated plans.
2. Contractor is to notify NC One Call for utility locations prior to the project start. Contractor is to maintain locates throughout the life of the project.
3. Whenever a proposed bore crosses a water or sewer main, the water or sewer main must be visually located via soft dig methods.
4. Required water and sewer utility clearances (both requirements must be met when the proposed water main is in the vicinity of water or sewer utilities):
  - a. 12 inch vertical clearance
  - b. 24 inch horizontal separation
5. Should any damage occur to City of Monroe water or sewer utilities, contact the Water Resources department immediately at 704-282-4601.
6. Contractor shall be responsible for any and all damage to any City of Monroe water or sewer facilities resulting from the installation of the proposed water main.
7. Should the Water Resources Department suspect an impact to a sewer utility as a result of the boring, a video inspection of the sewer utility shall be completed by the Contractor and supplied to the Water Resources Department to confirm no impact on the sewer utility has occurred.



STATE OF NORTH CAROLINA  
STREET NAME Westwood Industrial Drive; Union Power Way;  
Aeropointe Pkwy; James Hamilton Road; Chatterleigh Drive;  
Myers Road

COUNTY OF UNION

CITY OF MONROE  
AND  
Union County

RIGHT OF WAY ENCROACHMENT AGREEMENT  
MUNICIPAL STREET SYSTEM  
STANDARD FORM

THIS AGREEMENT, made and entered into this 11th day of December, 2020, by and between the City of Monroe, party of the first part; and Union County, party of the second part,

WITNESSETH:

THAT WHEREAS, the party of the second part desires to encroach on the right of way of the municipal street designated as Westwood Industrial Drive; Union Power Way; Aeropointe Pkwy; James Hamilton Road; Chatterleigh Drive; Myers Road located see attached plans.  
With the installation and/or erection of 36-inch DIP water transmission main with appurtenances and 16-inch DIP water transmission main with appurtenances with the methods and in the locations shown in the attached plans.

WHEREAS, it is to the material advantage of the party of the second part to effect this encroachment, and the party of the first part in the exercise of authority conferred upon it by North Carolina General Statute § 160A-296, is willing to permit the encroachment within the limits of the right of way as indicated, subject to the conditions of this agreement.

NOW, THEREFORE, IT IS AGREED that the party of the first part hereby grants the party of the second part the right and privilege to make the encroachment as shown on the attached plans, specifications, and special provisions, which are made a part hereof on the following conditions, to wit:

That this agreement applies only to the above municipal right of way, which is maintained by the City of Monroe or is to be accepted by the City for maintenance in the future. Party of the second part acknowledges that this encroachment agreement is specific to the existing or proposed municipal right of way described above and does not grant access to right of way areas outside the construction boundaries defined on attached plans. Each new and separate encroachment requires execution of a new encroachment agreement.

The party of the second part acknowledges that encroachment of any state right of way requires permission from and direct coordination with NCDOT, which is the responsibility of the party of the second part.

That the installation, operation, and maintenance of the above-described facility will be accomplished in accordance with the City of Monroe Standard Specifications and Details, along or within the right of way limits herein above described. This applies to all existing municipal rights of way currently maintained by the City and to proposed rights of way to be accepted by the City for maintenance.

That the party of the second part hereby agrees to indemnify and save harmless the party of the first part from all damages and claims for damage that may arise by reason of the installation and maintenance of this encroachment.

That the party of the second part acknowledges that the City of Monroe is in no way responsible for the Contractor's Quality Control/Quality Assurance program. The presence of the City of Monroe construction inspectors or other City employees or designee does not relieve the contractor of his responsibility to ensure the quality of workmanship and to certify that all construction meets the minimum requirements of this encroachment agreement and the City of Monroe's Standard Specifications and Detail Manual.

That the party of the second part agrees to provide, during construction and any subsequent maintenance, proper signs, signal lights, flagman, and other warning devices for the protection of traffic in conformance with the latest Manual on Uniform Traffic Control Devices and Amendments or Supplements thereto. Information as to the above rules and regulations may be obtained from the Engineering Director of the party of the first part.

That the party of the second part agrees to restore all areas disturbed during installation and maintenance to the satisfaction of the Engineering Director of the party of the first part. The party of the second part agrees to exercise every reasonable precaution during construction and maintenance to prevent eroding of soil, sifting or pollution of the rivers, streams, lakes, reservoirs, other water impoundments, ground surfaces or other property, or pollution of the air. Party of the second part shall comply with applicable rules and regulations of the North Carolina Division of Environmental Management, North Carolina Sedimentation Control Commission, and with all Erosion and Sedimentation Control Ordinances of the City of Monroe. When any installation or maintenance operation disturbs the ground surface and existing ground cover, party of the second part agrees to remove and replace the sod or otherwise re-establish the grass cover to meet the satisfaction of the Engineering Director of the party of the first part.

That the party of the second part agrees to assume the actual cost of construction, repairs, and any inspection of the work considered to be necessary by the Engineering Director of the party of the first part.

That the party of the second part assumes full responsibility for locating any existing utilities and developing a working relationship with existing utility owners to prevent damage to existing utilities.

That the party of the second part binds and obligates itself to install the encroaching facility to the horizontal and vertical alignments shown on the attached plans and shall not encroach upon any existing facility in such a way that maintenance or repair of the existing facility becomes burdensome to the existing facilities responsible party.

That the party of the second part binds and obligates itself to install and maintain the encroaching facility in such a safe and proper condition that it will not interfere with or endanger travel upon said street, nor obstruct or interfere with the maintenance thereof, and to reimburse the party of the first part for the cost incurred for any repairs or maintenance to its roadways and structures made necessary by reason of the installation and existence of the facilities of the party of second part, and if at any time the party of the first part shall require the removal of or changes in the location of the said facilities, that the party of the second part binds itself, its successors, and assigns to promptly remove or alter the said facilities without any cost to the party of the first part.

That the party of the second part guarantees all installation and repairs made pursuant to this encroachment agreement against defects in workmanship or materials for a period of 365 days from the date of the acceptance of said repairs, exclusive of the date of acceptance.

That in the case of noncompliance with the terms of this agreement by the party of the second part, the party of the first part reserves the right to stop all work until the facility has been brought into compliance or removed from the right of way at no cost to the party of the first part. In addition, the party of the first part reserves the right to refuse a future encroachment agreement submittals made by the party of the second part.

That it is agreed by both parties that this agreement shall become void if actual construction of the work contemplated herein is not begun within one (1) year from the date of authorization by the party of the first part unless written waiver is secured by the party of the second part.

That the party of the second part agrees to adhere to any special provisions or instructions assigned by the Engineering Director of the party of the first part after his review of this encroachment agreement and all supporting documents.

That the party of the second part agrees to pay inspection fees for encroachments into existing rights of way. Such fees shall be in accordance with the Fee Schedule located in the City of Monroe Code of Ordinances.

IN WITNESS WHEREOF, each of the parties to this agreement has caused the same to be executed in the day and year first above written.

APPLICANT (PARTY OF THE SECOND PART)

Stella Watson

Signature

William M. Watson, County Manager

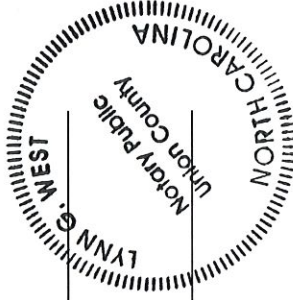
Name and Title (Please Print)

Lynn G. West

a notary public, to certify that William M.

500 N. Main Street

Watson personally appeared before me this day and acknowledged the due execution of the foregoing agreement. Witness my hand and notarial seal this 22nd day of September, 2020.



Monroe, NC 28112

Lynn G. West  
Notary Public (Signature)

City, State, Zip

My Commission expires February 28, 2023

CITY OF MONROE – DEPARTMENT OF ENGINEERING

APPROVED BY: Katie Millican

DATE: 12/11/2020

TITLE: Engineering Technician II

SUBMITTAL INSTRUCTIONS AND REQUIREMENTS

This agreement must be accompanied, in the form of an attachment, by plan, drawings, or other documentation showing the following applicable information:

1. Documentation, including written statements, indicating applicant has put forth reasonable effort in locating all existing utilities and has coordinated with utility owners for assistance in protecting said utilities;
2. Plan showing North arrow, scale, and clearly defined work area including structures, streets, right of way lines, existing utilities, sidewalks, and any other facilities effected by the encroachment;
3. Exact location of encroachment in relation to existing facilities/utilities- Relationship to existing facilities/utilities may be shown by plan, typical cross-section or reference to City of Monroe Standard Details;
4. Over-all dimensions of encroachment to include a cross-section detail of the utility in the right of way or reference to City of Monroe Standard Details, including repair details;
5. Cross-section of all grading operations, including slope ratio and reference by station where applicable;
6. Erosion Control / Drainage Plan when applicable;
7. Traffic Control Plan as required;

# **APPENDIX H – Duke Energy Transmission Line Letter of No Objection**







Duke Energy  
3308 NC Hwy 5  
Aberdeen, NC 28315  
910.944.5249  
[Lorick.Fanning@duke-energy.com](mailto:Lorick.Fanning@duke-energy.com)

October 1, 2020

Patrick Stout, P.E.  
Engineering Manager, Water  
Black & Veatch | 175 Regency Woods Place, Suite 200, Cary, NC 27518  
+1 919-462-7504 p | +1 919-457-7002 m | [StoutP@BV.com](mailto:StoutP@BV.com)  
<https://www.bv.com/markets/water>

Re: Duke Energy Transmission (“DET”) Line Easement Plan Review Conditional Approval  
WO# 31322651  
Project: UNION COUNTY PUBLIC WORKS WATER LINE CROSSING  
Line: CW 1M1993, STR 173.5, STP/1SFADC, MORNING STAR T TO MONROE MN 2018

Dear Andrew,

This office has reviewed the proposed UNION COUNTY PUBLIC WORKS WATER LINE CROSSING (as attached via email) and referred to herein as Attachment “A”. We find the plans as shown on the referenced drawings to be acceptable and in compliance with the attached Use Guidelines for Encroachments involving Transmission Easements. Therefore, Duke Energy Transmission (“DET”) approves the referenced plans, insofar as its transmission easement rights are concerned, subject to the conditions detailed below. If this project construction has not commenced by a period of 12 months from the date of this letter, this approval by DET shall expire, and an additional plan review will be required by DET at that time.

In summary, the following details Duke Energy comments:

- Notwithstanding our review of your development plans, we are not providing a comment on present or future vegetation plantings. However, please be apprised that to ensure safe and reliable service and to maintain the ability to safely access its easement, Duke Energy relies on clear easement areas to provide open spaces for the staging of large equipment. Therefore, Duke Energy has and continues to manage vegetation within or outside of the easement and retains the rights afforded to it in its underlying easement documents, including to remove vegetation that has the potential to or does cause an interference with its easement rights.
- No stockpiling or storage of materials, dirt, or equipment of any kind is permitted within the DET easement area, nor may any combustible materials be placed within the easement area.
- You and/or your contractors operating any and all equipment should be instructed not to operate within 25’ of the poles, towers, or other electrical structures including guy anchors. All slopes shall be 4:1 or less. No spoil dirt is to be placed within the easement limits unless previously approved by DET.
- Any proposed easements must not cross closer than 25’ to DET’s electrical structures including, but not limited to poles, towers, and guy anchors.
- All underground facilities, such as, but not limited to, storm water pipes and domestic water line pipes, must be capable of a heavy equipment load bearing weight of 80,000 lbs. DET will not be responsible for damages to these installed facilities. Additionally, Irrigation systems and signs are not permitted in the easement area.
- All plats, plans, renderings and representations of lots, parcels, designated spaces and/or designated areas having and including area within a DET easement cannot represent, with setbacks or other means, buildable areas(s) within a DET easement.

- Underground Utilities with cathodic protection will require a study of anodic interference on existing DET structures. The developer / owner is responsible for any required remediation as determined by DET. This study shall be provided at no cost to DET for their review and acceptance before a Final Approval shall be issued by DET. This study must be submitted to DET prior to the commissioning of the Underground Utilities.
- Any damage to the transmission line or its associated structures, related to this project, and/or claims due to the damage, is the responsibility of the developer/owner.
- This approval by DET is subject to the paramount right of DET at all times to make use of its entire easement area for the construction, maintenance, reconstruction, and operation of electric lines.
- This letter only addresses issues related to the DET's transmission line easement. Additional easements, approvals, or permits from the underlying property owner(s) or other applicable agencies may be required for you to proceed with this project.

DET also offers these additional comments to ensure that other potential conflicts are not created during or after construction: We have not reviewed, and therefore have not approved, any plans other than Attachment "A".

- If there are design changes to any drawings that involve the transmission easements, DET must review the changes for compliance with the Use Guidelines for Encroachments involving Transmission Easements.
- Proper clearances must be maintained at all times. If any transmission line modification by DET is required to maintain proper clearances, the cost will be the responsibility of the developer/owner. Any such line modifications must be approved and scheduled, through DET well in advance of the project start date.
- To avoid obstructions and interferences all current and future property owners should adhere to the most current version of the DET Use Guidelines for Encroachments involving Transmission Easements.
- DET heavy equipment access must not be restricted during this project due to grading or other activity.
- Please contact me prior to the start of this project to attend any pre-construction meetings.

In not objecting to the use of the transmission easement for use as shown on the drawings, DET is not relinquishing the right to control and maintain the transmission easement as specified in the recorded agreements. Any damages to the transmission lines or its associated structures, and claims caused by the damage, is the responsibility of the developer/contractor. It is the responsibility of the contractors/owners to ensure that all work performed in the proximity of the transmission lines complies with all applicable laws and regulations, including but not limited to the National Electric Safety Code ("NESC"), the Overhead High-Voltage Line Safety Act ("OHVLSA"), and the Occupational Safety and Health Act ("OSHA"), and that all persons working near the electric power lines are made aware of the inherent safety hazards associated with these lines.

Please note that this approval is based in part on the accuracy of the information you have supplied on the plans (Attachment "A"). You are responsible for indicating the correct location of the DET easement and its associated electrical structures along with the correct width of the DET easement limits.

Thank you for your cooperation. If you have any questions, please feel free to contact me at 910-706-1681.

Sincerely,



Lorick Fanning  
 Asset Protection Specialist  
 Transmission Asset Protection

Attachments: Attachment "A", Referenced Site Plans, Duke Energy Use Guidelines for Encroachments involving Transmission Easements, and the Duke Energy "Look Up & Live" Brochure.

Referenced Site Plans:

## UNION COUNTY PUBLIC WORKS 853W ZONE IMPROVEMENTS PHASE I TRANSMISSION MAINS

### Additional Notes – Conditions:

- 1. Provide the below attached Duke Energy “Look Up and Live” Brochure to all those working in proximity to the high voltage transmission power lines.
- 2. During site construction a cement barrier is required as a “Jersey” type barrier to protect any Duke Energy Progress transmission power poles which will be within 50’ of any construction traffic.





LEGEND

Legend table listing symbols for utilities (EIP, CONCRETE MON. FOUND, EXISTING STONE, NPS, RIGHT-OF-WAY MON., WATER MANHOLE, FIRE HYDRANT, WATER VALVE, WATER METER, WATER VAULT, WATER WELL, STORM MANHOLE, CATCH BASIN, DROP INLET, FLARED END SECTION, TELEPHONE POLE, TELEPHONE PEDESTAL, FIBER OPTIC BOX, GAS METER, GAS VALVE, GAS MARKER POST), structures (UTILITY POLE, POWER POLE, LIGHT POLE, TRANSFORMER, GUY WIRE, ELECTRIC METER, ELECTRIC BOX, HEAT PUMP, TRAFFIC SIGNAL BOX, SANITARY SEWER MANHOLE, CLEAN OUT, CABLE TV BOX, UNIDENTIFIED PEDESTAL, UNIDENTIFIED OBJECT, SATELLITE DISH, MONITORING WELL, POST, MAIL BOX, ROAD SIGN, TEMPORARY BENCHMARK), lines (BOUNDARY LINE, RIGHT-OF-WAY LINE, EASEMENT LINE, TIE LINE, MAJOR/MINOR CONTOUR LINE, STORM SEWER PIPE, SANITARY SEWER LINE, SANITARY FORCE MAIN LINE, BURIED WATERLINE, BURIED WATERLINE (BY PLANS), OVERHEAD POWER LINE, OVERHEAD TRAFFIC SIGNAL LINE, OVERHEAD UTILITY LINE, BURIED POWER LINE, BURIED TELEPHONE LINE, BURIED FIBER OPTIC LINE, BURIED CABLE TV LINE, BURIED GAS LINE, BURIED UTILITY LINE (UNIDENTIFIED), FENCE LINE, EDGE OF STREAM/POND, TREE LINE, BRUSH LINE, APPROX. 1% ANNUAL CHANCE FLOODPLAIN, APPROXIMATE FLOODWAY, EDGE OF WETLAND / IMPORTANT STREAM), and other features (EARTH OR GRADE, GRANULAR FILL OR GRAVEL, EXISTING OR PRECAST CONCRETE, TEMPORARY PERMANENT EASEMENT, DEMOLISH AND DISPOSE, ABANDONED, RIP-RAP, EROSION MATTING, WETLANDS, GATE VALVE, BLOW-OFF, SILT FENCE, CONSTRUCTION FENCE, TREE PROTECTION FENCE, WATTLES, STONE OUTLET, GEOTECHNICAL BORING SYMBOL, CONSTRUCTION ENTRANCE, SECTION No. OR DETAIL LETTER, DRAWING NUMBER ON WHICH SECTION OR DETAIL APPEARS, STONE SILT CHECK DAM, HALF-RING INLET PROTECTION).

ABBREVIATIONS

Table of abbreviations for various terms including AC (ACRES), ALUM (ALUMINUM), ARMH (AIR RELEASE MANHOLE), B-B (BACK OF CURB), BC (BURIED CABLE), BH (BORE HOLE), BM (BENCH MARK), BO (BLOW-OFF), BV (BALL VALVE), BW (BARBED WIRE), CATV (CABLE TELEVISION), CB (CATCH BASIN), C&G (CURB AND GUTTER), CIP (CAST IRON PIPE), C/L (CENTER LINE), CMP (CORRUGATED METAL PIPE), CO (CLEANOUT), CONC (CONCRETE), CONSTR (CONSTRUCTION), CM (CONCRETE MONUMENT), CY (CUBIC YARD), DET (DETAIL), DIA (DIAMETER), DIP (DUCTILE IRON PIPE), DOT (DEPARTMENT OF TRANSPORTATION DRIVE), DR (DRIVE), E (EAST), EF (EACH FACE), EIP (EXIST IRON PIPE), EL, ELEV (ELEVATION), ELECT (ELECTRIC(AL)), EP (EDGE OF PAVEMENT), ESMT (EASEMENT), EW (EACH WAY), EXIST (EXISTING), EXP (EXPANSION), EXT (EXTENSION), FH (FIRE HYDRANT), FIN (FINISHED), FL (FLOW LINE), FLG (FLANGE), FM (FORCE MAIN), FO (FIBER OPTIC), FP (FLOOD PLAIN), FW (FLOOD WAY), GALV (GALVANIZED), GRD (GROUND), GR (GRADE), HORIZ (HORIZONTAL), HSE (HOUSE), HWY (HIGHWAY HWY), INV (INVERT), IP (IRON PIPE), LA (LINE AHEAD), LB (LINE BACK, POUND), LF (LINEAR FEET), LN (LANE), LP (LIGHT POLE), LT (LEFT), MAX (MAXIMUM), MB (MAIL BOX), MC (MECHANICAL COUPLING), MH (MANHOLE), MIN (MINIMUM), MJ (MECHANICAL JOINT), MON (MONUMENT), N (NORTH), NCDOT (NORTH CAROLINA DEPARTMENT OF TRANSPORTATION), No. (NUMBER), NTS (NOT TO SCALE), OC (ON CENTER), OD (OUTSIDE DIAMETER), PB (NEWSPAPER BOX), PC (POINT OF CURVATURE), PE (PLAIN END), PED (PEDESTAL), PERM (PERMANENT), PI (POINT OF INTERSECTION), POC (POINT ON CURVE), POT (POINT ON TANGENT), PP (POWER POLE), PT (POINT OF TANGENCY), PVC (POLYVINYL CHLORIDE), PVMT (PAVEMENT), R, RAD (RADIUS), R&C (RING AND COVER), REINF (REINFORCED), RCP (REINFORCED CONCRETE PIPE), RD (ROAD), RR (RAILROAD), RT (RIGHT), R/W (RIGHT-OF-WAY), REQD (REQUIRED), RWTM (RAW WATER TRANSMISSION MAIN), S (SOUTH, SIGN), SB (SEDIMENT BASIN), SF (SQUARE FEET), SHT (SHEET), SL (SURVEY LINE), SPK (SPIKE), SQ (SQUARE), SR (SECONDARY ROAD), SS (SANITARY SEWER), ST (STREET), STA (STATION), STL (STEEL), SY (SQUARE YARD), T (TANGENT), TBM (TEMPORARY BENCH MARK), TCP (TERRA COTTA PIPE), TEL (TELEPHONE), TV (TELEVISION), TYP (TYPICAL), US (UNITED STATES), VC (VITRIFIED CLAY), VERT (VERTICAL), W (WEST, WIDE), WI (WITH), WL (WATERLINE), WM (WATER METER), WV (WATER VALVE), WTP (WATER TREATMENT PLANT), YR (YEAR), YI (YARD INLET), & (AND), @ (AT), C/L (CENTERLINE), Ø (DIAMETER), # (NUMBER), % (PERCENT).

GENERAL NOTES:

- 1. SOME SYMBOLS, MATERIALS AND ABBREVIATIONS MAY NOT BE UTILIZED ON THIS SPECIFIC PROJECT.
2. LOCATION OF EXIST UTILITIES SHOWN ARE APPROXIMATE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING THE RESPECTIVE UTILITY COMPANY TO OBTAIN A MORE PRECISE LOCATION...
3. AERIAL SURVEY PROVIDED BY AVOIMAGE MAPPING SERVICES, INC. FIELD SURVEY AND BASE MAPPING WERE PROVIDED BY CESI CIVIL - GEOTECHNICAL - SURVEYING. HORIZONTAL CONTROL IS BASED UPON LOCALIZED NC GRID COORDINATES SYSTEM, NAD 83(2011). ELEVATIONS ARE BASED UPON NAVD 1988.
4. THE CONTRACTOR SHALL BE RESPONSIBLE AT ALL TIMES FOR WORK ZONE TRAFFIC SAFETY AND CONTROL. ALL WORK ZONE TRAFFIC CONTROL DEVICES AND OPERATIONS USED ON STREET AND HIGHWAY CONSTRUCTION, MAINTENANCE, UTILITY OR INCIDENT MANAGEMENT SHALL CONFORM TO THE APPLICABLE SPECIFICATIONS...
5. CONTRACTOR SHALL CONTACT PROPERTY OWNERS 48 HOURS PRIOR TO WORKING IN AN EASEMENT ON THAT PROPERTY. CONTRACTOR SHALL NOT ACCESS PROPERTY OUTSIDE OF EASEMENT WITHOUT PRIOR WRITTEN PERMISSION FROM PROPERTY OWNER.
6. EASEMENT LINES, RIGHT-OF-WAY LINES, AND PROPERTY LINES ARE SHOWN IN THE DESIGN DRAWINGS AND ARE FOR REFERENCE ONLY.
7. MAIL BOXES, SIGNS, WATER METERS AND RETAINING WALLS SHALL BE REMOVED BY THE CONTRACTOR WHEN NECESSARY FOR PIPE INSTALLATION AND REPLACED WITHOUT DAMAGE.
8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL PROPERTY CORNER MARKERS. PROPERTY CORNER MARKERS DAMAGED BY CONSTRUCTION ACTIVITIES SHALL BE REESTABLISHED BY A PROFESSIONAL SURVEYOR LICENSED IN THE STATE OF NORTH CAROLINA.
9. CONTRACTOR MAY CLEAR AND GRUB AREAS WITHIN PERMANENT EASEMENT AND TEMPORARY EASEMENT AS REQUIRED FOR CONSTRUCTION OF PIPELINE. CONTRACTOR SHALL LIMIT CLEARING WITHIN THE TEMPORARY CONSTRUCTION EASEMENT TO WHAT IS NECESSARY TO COMPLETE THE WORK WHERE NOTED, TREES AND SHRUBS SHALL BE PROTECTED AND SAVED.
10. CONTRACTOR SHALL INSTALL ALL PIPELINES, PAVING, WALKWAYS, AND CURB AND GUTTER ALONG EXISTING GRADE BETWEEN ELEVATIONS DEPICTED ON THE DRAWINGS.
11. THE CONTRACTOR'S OPERATIONS SHALL CONFORM TO OSHA, LOCAL, OR STATE REGULATIONS, WHICHEVER IS MORE STRINGENT, PERTAINING TO EXCAVATION AND TRENCHING.
12. RESTRAINED JOINTS SHALL BE PROVIDED FOR BURIED PIPING AS INDICATED ON THE DRAWINGS.
13. RESTORATION OF STRUCTURES SUCH AS CURBS AND GUTTERS, CONCRETE AND ASPHALT DRIVES AND WALKWAYS, PAVING BRICKS, FENCING, RETAINING WALLS, ETC., CROSSED BY THE PIPELINE ARE NOT ALL INDICATED ON PLANS. CONTRACTOR SHALL RESTORE ANY EXISTING STRUCTURES THAT ARE DISTURBED, DAMAGED, OR REMOVED BY CONSTRUCTION.
14. CONTRACTOR SHALL REPLACE IN THEIR ENTIRETY EXISTING PIPE CULVERTS THAT ARE REMOVED TO INSTALL THE NEW PIPELINE. CONTRACTOR TO PROVIDE AND INSTALL NEW PIPE CULVERTS OF THE SAME SIZE, MATERIAL AND CONSTRUCTION AT THE SAME LOCATION AND INVERT ELEVATION AS THOSE THAT WERE REMOVED, AND SHAPE THE DITCH TO DRAIN WITH THE REPLACED CULVERT.
15. HORIZONTAL STATIONING ALONG THE PIPELINE ALIGNMENT IS FOR LEVEL LINE MEASUREMENT AND FOR PAYMENT OF THE PIPELINES. CONTRACTOR SHALL PROVIDE AND INSTALL THE ACTUAL PIPE LENGTH TO BE DETERMINED BY THE SLOPE OR CURVE ON WHICH THE PIPE IS INSTALLED.
16. PIPELINE SHALL BE INSTALLED AS SHOWN ON THE DRAWINGS WITH A MINIMUM PIPE COVER OF 4 FEET BELOW EXISTING GRADE OR 3 FEET BELOW ROCKY RIVER ROAD CENTERLINE WHICHEVER IS GREATER, UNLESS OTHERWISE NOTED.
17. AIR RELEASE MANHOLES (MH) SHALL BE LOCATED AT HIGH POINTS IN THE PIPELINES AS SHOWN IN PROFILE OR WHERE DIRECTED BY ENGINEER.
18. CONTRACTOR SHALL FIELD VERIFY PRECISE LOCATION, ELEVATION, AND ARRANGEMENT OF CONNECTIONS OF NEW PIPELINES WITH EXISTING PIPELINES BASED ON FIELD CONDITIONS, INCLUDING EXPOSING EXISTING PIPING PRIOR TO FABRICATING NEW PIPING.
19. AT LOCATIONS WHERE THE PIPELINE CROSSES AN EXISTING FENCE, THE FENCE SHALL BE TEMPORARILY REMOVED DURING CONSTRUCTION.
20. CONTRACTOR SHALL VERIFY EXISTING PIPE OUTSIDE DIAMETERS AND HAVE APPROPRIATELY SIZED SLEEVES AND ALL OTHER REQUIRED PIPE AND FITTINGS ON SITE PRIOR TO CONNECTION TO EXISTING PIPELINES.
21. STATION CALL OUTS ALONG PERMANENT EASEMENTS AND CONSTRUCTION EASEMENTS ARE ALONG THE CENTER LINE OF THE WATERLINE.
22. RESTRAINED JOINT PIPING IS REQUIRED IN THE LOCATIONS INDICATED ON THE DRAWINGS BASED UPON THE VALVE AND FITTING LOCATIONS SHOWN.
23. EXISTING ASBESTOS CEMENT PIPELINES ARE LOCATED THROUGHOUT THE PROJECT AREA. CONTRACTOR IS RESPONSIBLE FOR ALL HEALTH AND SAFETY PRECAUTIONS FOR WORKING WITH AND NEAR ASBESTOS MATERIALS.
24. THE CONTRACTOR SHALL REVIEW AND UNDERSTAND THE EPA REGULATIONS REGARDING REGULATED AND NON-REGULATED ASBESTOS CONTAINING MATERIALS AND UNDERSTAND THE CONSTRUCTION PROCEDURES REQUIRED TO MAINTAIN THE NON-REGULATED STATUS OF BURIED ASBESTOS CEMENT PIPE.
25. ADDITIONAL EROSION CONTROL MEASURES MAY BE REQUIRED BASED ON SPECIFIC SITE CONDITIONS.
26. CONTRACTOR SHALL VIDEO THE ENTIRE WATER TRANSMISSION MAIN ROUTE IN ADVANCE OF COMMENCING CONSTRUCTION.
27. CONTRACTOR SHALL MAINTAIN ACCESS TO ALL PARKING FACILITIES, BUSINESSES, AND RESIDENCES AT ALL TIMES UNLESS OTHERWISE COORDINATED AND APPROVED BY THE PROPERTY OWNER AND/OR ENGINEER.
28. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE TO CITY OF MONROE FACILITIES AS RESULT OF CONSTRUCTION ACTIVITIES.
29. ANY TEST HOLES FOR AC MAINS SHALL BE BACKFILLED WITH EXCAVATABLE FLOWABLE FILL (LESS THAN 200 PSI COMPRESSIVE STRENGTH) FROM THE TRENCH FLOOR TO A MINIMUM OF 2-FEET ABOVE THE TOP OF THE MAIN.
30. IF ANY AC WATER MAIN IS EXPOSED AT A TRENCH CROSSING, SAID WATER MAIN SHALL BE REPLACED TO THE NEAREST JOINT OUTSIDE THE TRENCH WALLS WITH CLASS 350 DIP AND CONNECTED BACK BY USE OF HYMAX COUPLING OR APPROVED EQUAL.
31. CONTRACTOR WILL NOT BE ALLOWED TO WASTE EXCESS SOIL ON THE WORK SITE. ALL DISTURBED AREAS ARE TO BE RETURNED TO PRE-CONSTRUCTION GRADES UNLESS OTHERWISE NOTED.
32. EXISTING VALVE OPERATIONS WILL BE PERFORMED BY UNION COUNTY PERSONNEL ONLY. CONTRACTOR SHALL COORDINATE WITH UNION COUNTY A MINIMUM OF 96 HOURS PRIOR TO ANY SERVICE INTERRUPTIONS OR VALVE OPERATIONS.



Project information and administrative area including: UNION COUNTY PUBLIC WORKS 853W ZONE IMPROVEMENTS PHASE I TRANSMISSION MAINS; LEGEND, ABBREVIATIONS, AND GENERAL NOTES; DESIGNER: MLT, WPS; DATE: MARCH 2020; PROJECT NO. 186110; SHEET 2 OF 45; A1; and a table for REVISIONS AND RECORD OF USE.















## USE GUIDELINES FOR ENCROACHMENTS INVOLVING TRANSMISSION EASEMENTS

Duke Energy has a property interest called an easement (or sometimes a right-of-way) in land that you own or are considering purchasing. This easement grants Duke Energy the right to use the easement area for purposes described in the easement document that is filed and recorded in the county's recorder office. This property interest stays with the land when it is bought and sold and generally is perpetual in duration. A series of easements often form a corridor in which the transmission facilities are located and access up and down the corridor is part of the reason Duke Energy obtains these rights.

Broadly stated, easements allow Duke Energy to use another person's property to construct, operate, maintain, repair, and replace electrical facilities for the transmission of high voltage power. The landowner may continue to use the easement area so long as the use is not inconsistent with the easement document or Duke Energy's use of the easement. Any incompatible use by the landowner is called an encroachment. Where an encroachment is under construction, Duke Energy will request that it be stopped and removed; where an encroachment is already installed, Duke Energy will request that it be removed. Where a landowner fails to cooperate, Duke Energy will seek legal recourse to remove the encroachment.

Electricity is a public service and subject to state and federal regulations with which Duke Energy must comply. Any use by the landowner that does or could create regulatory issues is an encroachment. Power lines in the transmission easement are uninsulated and electricity is a dangerous instrumentality. Any landowner use that increases the danger to the landowner, the public or Duke Energy in its use of the easement is also an encroachment.

Over years of designing, constructing, operating, repairing, upgrading and maintaining electric facilities in transmission easements, Duke Energy has developed an understanding of the types of uses by landowners that do, or potentially can, interfere with the easement's purposes and Duke Energy's ability to provide safe and reliable service. This guidance, which supersedes all prior versions, provides a brief overview of types of things that do, or can, interfere with Duke Energy's easement rights and thereby create encroachments.

This overview cannot address all possible situations and is intended to provide general guidance. Please contact the Asset Protection Specialist if you have additional questions or concerns about the use of the easements. Please discuss any proposed activity in the transmission easements with Duke Energy to avoid creating an encroachment or interference. The Asset Protection Specialist can assist and help avoid a subsequent need by the landowner to revise plans or remove obstructions from the easements. Engineering plans may be required by Duke Energy to fully understand any proposed use by the landowner.

By providing these guidelines, Duke Energy does not waive any rights it has in its easements or under the law. Duke Energy's concurrence that a proposed use does not constitute an interference with its easement rights does not mean that requirements of local, county, state or federal governments or other agencies with governing authority have been met.

The following are not permitted in Duke Energy's transmission easements as they interfere with Duke Energy's use of the easements for transmission of electricity by, among other things, interfering with full use the easement, interfering with existing facilities, interfering with access to the facilities, interfering with future expansion in the easement, increasing the danger to the public or those who may be required to work in the easement, creating regulatory violations and generally, making the transmission of electricity more dangerous, costly and/or unreliable: Examples include but are not limited to:

- Permanent or temporary structures and buildings, including for example, permanent or manufactured/mobile homes (and home additions and extensions), garages, sheds, satellite systems, intersections, cul-de-sacs, entrances, streets, swimming pools (any associated equipment and decking), playground equipment, graves, billboards, dumpsters, signs, wells, deer stands, retaining walls, septic systems or tanks (whether above or below ground).
- Mounding or stockpiling any material, such as spoils, dirt, logs, construction or building material, wrecked or disabled vehicles, (e.g. may create clearance and access issues and/or increases dangers in using the easement).
- Transformers, telephone/cable pedestals and associated equipment (unless specifically addressed in a joint use agreement), fire hydrants, manholes, water valves, water meters, backflow preventers & irrigation heads, (e.g. may increase the likelihood of safety hazards & access issues).

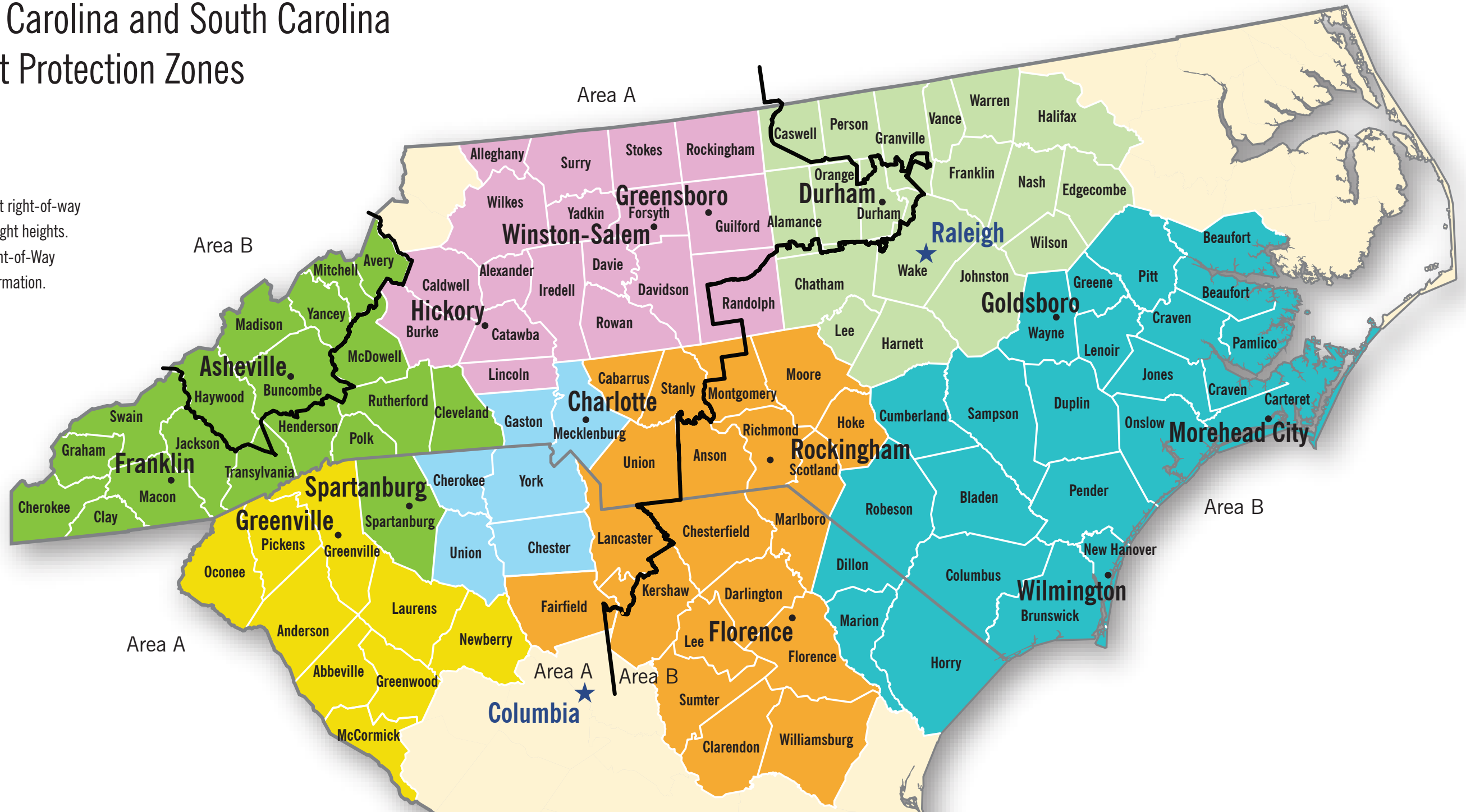
- Attachments to Duke Energy structures in the easement; (unless specifically addressed in a joint use agreement).
- Streets, roads, driveways, sewer/water lines, other utility lines or any underground facilities that run in parallel to the centerline in the easement or cross in one contiguous segment from outside edge of easement to opposing outside edge of easement, at any angle that is less than 30 degrees or greater than 90 degrees as measured from the centerline. No portion of such facility shall be located within 25 feet of Duke Energy's facilities (unless specifically addressed in a joint use agreement.)
- Fences or utilities that cross the easement in multiple segments in a non-continuous alignment from outside edge of easement to opposing outside edge of easement at any angle of less than 30 degrees or greater than 90 degrees as measured from the centerline. This generally creates an interference as the ability to access and utilize the full easement and reach facilities in the easement is substantially impaired. If a fence crosses the easement at an angle greater than or equal to 30 degrees and less than or equal to 90 degrees with the centerline, a gate (16 feet wide at each crossing) shall be installed by the landowner, per Duke Energy's specifications. Duke Energy will supply a lock. The landowner is required to install the Duke Energy lock on the gate to ensure access. The lock can be interlocked with the landowner's lock. Fences and gates that exceed 10 feet in height are prohibited because they create a clearance issue and are an interference. Fences that inhibit Duke Energy's access because they lack a gate that is at least 16 feet wide, interfere with Duke Energy's easement use.
- Grading (cuts or fill) in the easement that is closer than 25 feet to transmission facilities i.e. poles, towers, guys and anchors and/or slopes greater than 4:1 no matter where located or that otherwise change clearances or topography.
- Parking or lighting facilities which affect clearances, access or Duke Energy's ability to make full use of its easement.
- Placement of combustible materials and/or the purposeful burning of anything within the easement are inconsistent with electric facilities, the transmission of power and create safety hazards and system reliability issues.
- Any water feature in the easement, such as a detention and retention pond, stream or lake. Where a structure outside the easement causes erosion or directs storm water toward the easement or the electric facilities or access to or around the electric facilities, such structure will interfere with Duke Energy's use and must be altered to eliminate that effect.
- Incompatible vegetation above ground transmission lines - Vegetation within or outside of the transmission easement that will mature to a height or size that will pose a grow-in, fall-in, or blowing-together threat to the transmission conductor (typical maximum mature height greater than 15 feet within the transmission easement depending on location and voltage).
- Incompatible vegetation underground transmission lines - Vegetation within or outside of the transmission easement that is capable of posing a threat (e.g., root systems, etc.) to the underground transmission conductor by **a**) causing damage to the underground pipes / cables or **b**) reducing the moisture in the soil, thus altering the thermal properties of the surrounding soil / backfill and thereby negatively impacting the cable ampacity rating (typical maximum mature height within the easement - greater than 3 feet depending on location and voltage).
- Incompatible vegetation for safe and reliable operation and access on all transmission lines - Vegetation that will limit or block access, limit the safe and reliable operation, emergency restoration, or maintenance of the transmission facilities, limit the full use of the transmission easement for its intended purposes or vegetation which is typically within a horizontal distance of 25 feet of any Duke Energy facilities (towers, poles, guy wires, guy anchors, manholes, dip-poles, substation equipment, etc.).

As discussed, these guidelines are not exhaustive and there may be other interferences on a case-by-case basis depending on individual circumstances. Certain conditions such as line voltage, line criticality, frequency of required access and structure type may require heightened restrictions in the easements to provide safe and reliable service.

If you have additional questions or plan any activity not mentioned above, please contact customer service and ask for your local Transmission Asset Protection Specialist.

# Duke Energy North Carolina and South Carolina Transmission Asset Protection Zones

Area A and Area B have different right-of-way restrictions related to tree and light heights. Please refer to the attached Right-of-Way Restrictions Guide for more information.



## Asset Protection Right-of-Way Specialist Zones

- |  |   |  |  |
|--|---|--|--|
| <span style="color: green;">■</span> Zone 1 – Craig Garrett 828.258.5018<br>craig.garrett@duke-energy.com    | <span style="color: lightblue;">■</span> Zone 3 – Stephen Lord 704.812.2316<br>stephen.lord@duke-energy.com | <span style="color: orange;">■</span> Zone 5 – Lorick Fanning 910.944.5249<br>lorick.fanning@duke-energy.com | <span style="color: lightgreen;">■</span> Zone 7 – Bruce Pait 919.431.4831<br>bruce.pait@duke-energy.com |
| <span style="color: yellow;">■</span> Zone 2 – Johnny Wagner 864.234.4382<br>jonathan.wagner@duke-energy.com | <span style="color: pink;">■</span> Zone 4 – Ethan Pardue 336.526.2524<br>ethan.pardue@duke-energy.com      | <span style="color: teal;">■</span> Zone 6 – Bill Wilder 910.772.4903<br>bill.wilder@duke-energy.com         |  |

Legend – updated 12/17/19





## Your safety is our priority

We have a goal at Duke Energy – to eliminate injury and death from needless power line contacts. We want to provide you with the information you need to stay safe at work.

## Important OSHA minimum approach regulation

The following table is from OSHA 1910.333 and applies to nonqualified persons working in proximity to energized power lines. The minimum approach distance is to be maintained for nonqualified workers. When using equipment classified as a crane or derrick, OSHA 29 CFR 1926.1407-1411 must be followed.

OSHA - 1910.333 Applies to NonQualified Persons Minimum Approach Distance	
Up to 50 kV	10 Feet
50 kV up to 200 kV	15 Feet
200 kV up to 350	20 Feet
350 to 500 kV	25 Feet
500 kV to 750 kV	35 Feet

## Important OSHA crane regulation

Cranes and derricks near transmission power lines – OSHA 29 CFR 1926.1407-1411

This regulation applies to power-operated equipment used in construction that can hoist, lower and horizontally move a suspended load. Such equipment includes, but is not limited to:

If any part of equipment, load line or load could get closer than 20 feet to less than 350 kV power lines or 50 feet for greater than 350 kV power lines, you must speak with a Duke Energy representative before beginning work.

Such equipment includes, but is not limited to:

- Articulating cranes (such as knuckle boom cranes)
- Floating cranes
- Locomotive cranes
- Multipurpose machines when configured to hoist and lower (by means of a winch or hook) and horizontally move a suspended load
- Industrial cranes (such as carry deck cranes)
- Pedestal cranes
- Straddle cranes
- Derricks
- Overhead bridge and gantry cranes NOT permanently installed
- Crawler cranes
- Cranes on barges
- Side boom tractors
- Base-mounted drum hoists only when used with derricks
- Tower cranes
- Portal cranes
- Service/mechanic trucks with a hoisting device
- Dedicated pile drivers
- Mobile cranes (such as wheel-mounted, rough-terrain, all-terrain, commercial truck-mounted and boom truck cranes)
- Variations of these types of equipment



## Look up and live.

Working around high-voltage transmission lines



Know how to protect yourself, your crew and the public when working around transmission lines.

## Contact us

For more information, please visit [duke-energy.com/safety](http://duke-energy.com/safety) or call:

Duke Energy Carolinas  
800.777.9898 or 800.POWERON

Duke Energy Indiana  
800.521.2232

Duke Energy Kentucky or Ohio  
800.544.6900

Duke Energy Progress  
800.452.2777

Duke Energy Florida  
800.700.8744

Duke Energy cares about your safety. This brochure contains important information for:

- Anyone working around power lines
- Grading contractors
- Forklift operators
- Crane operators
- Developers (residential, commercial, industrial)
- Architects and engineers
- Dump truck operators

550 South Tryon Street  
Charlotte, NC 28202



[www.duke-energy.com](http://www.duke-energy.com)

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## Know your voltage, know your clearance

## A planned project is a safe project

Federal law requires that all contractors maintain at least a 10-foot clearance from overhead power lines up to 50 kV. Greater clearance is required for higher-voltage power lines and cranes and derricks in construction.

Contact Duke Energy at least three working days before you start working near overhead power lines and equipment so that safety recommendations can be made.

Treat all transmission lines, regardless of their operating voltage, with caution:

- 44 kV and 100 kV lines look similar.
- Never assume a voltage based on the illustration.
- Minimum clearance includes maximum sag, which must be calculated for each instance.
- Injury or death can occur without touching power lines.
- Assume all overhead power lines are energized.
- Contact Duke Energy if you are in doubt about safe operating distances.

### Fact 1.

Power lines that serve your homes and businesses are not insulated like home appliance cords.

### Fact 2.

Power lines carry 4,000 to 500,000 volts of electricity that can seriously injure or kill on contact.

### Fact 3.

The simplest way to stay safe is to know where your power lines are located and stay away.

Check the job site for hazards and know the location of all overhead power lines and electric equipment, including poles and guy wires.

Consider all overhead lines as energized. Mark the work site boundaries to keep workers, vehicles, tools and equipment a safe distance from electric lines and equipment.

Hold a pre-work safety meeting, pointing out areas where overhead lines and electric equipment are located.

We can help you:

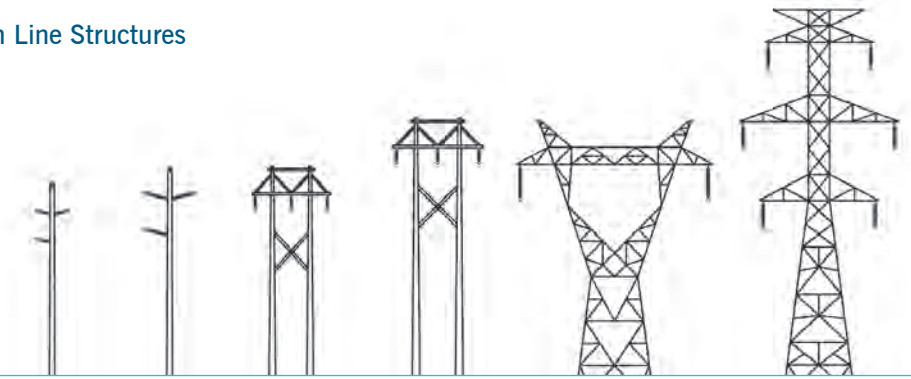
- Confirm voltage
- Confirm clearance
- Confirm wire height under peak conditions
- Provide safety guidance around power lines
- Review and approve drawings for:
  - Compliance with right-of-way restrictions
  - Compliance to National Electric Safety Code
- Identify the best, safe solution

Emergency situations

If your equipment makes contact with an overhead power line, notify Duke Energy immediately and take these precautions:

- Have someone call 911.
- Do not attempt to turn off engines or generators.
- Move equipment away from the line only if it is safe to do so.
- Remain on equipment until utility workers arrive and de-energize the line.
- Warn others to stay away. Those on the ground can be injured or killed if they make contact with the equipment.
- If you must leave the equipment because of fire or other dangers, jump off with your feet together. Never touch the ground and equipment at the same time. Keeping your feet together, shuffle or hop away until you are clear of the area.

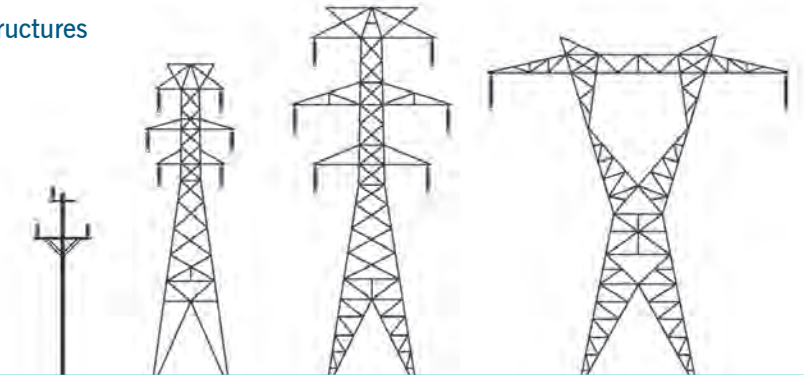
Duke Energy Midwest Transmission Line Structures



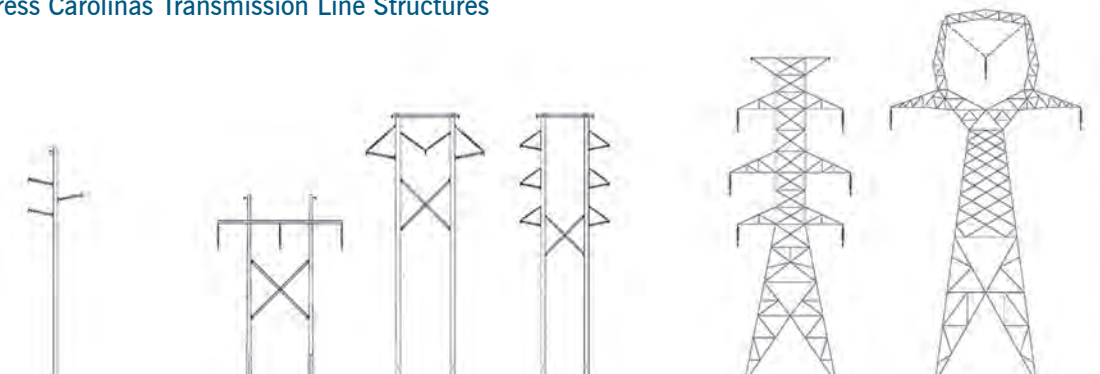
Duke Energy Florida Transmission Line Structures



Duke Energy Carolinas Transmission Line Structures



Duke Energy Progress Carolinas Transmission Line Structures



For more information, visit [duke-energy.com/safety](http://duke-energy.com/safety).



**APPENDIX I – Piedmont Natural Gas/Duke Energy Gas  
Encroachment Agreement**

**To be issued via Addendum**



Section 01025

MEASUREMENT AND PAYMENT

1. SCOPE. This section covers methods of measurement and payment for items of Work under this Contract.
  
2. GENERAL. The Contract Price shall cover all Work required by the Contract Documents. All costs in connection with the proper and successful completion of the Work, including furnishing all materials, equipment, supplies, and appurtenances; providing all construction plant, equipment, and tools; and performing all necessary labor and supervision to fully complete the Work, shall be included in the unit and lump sum prices bid. All Work not specifically set forth as a pay item in the Bid Form shall be considered a subsidiary obligation of Contractor and all costs in connection therewith shall be included in the prices bid.
  
3. ESTIMATED QUANTITIES. All estimated quantities stipulated in the Bid Form 00410 Section 5.01 or other Contract Documents are approximate and are to be used only (a) as a basis for estimating the probable cost of the Work and (b) for the purpose of comparing the Bids submitted for the Work. The actual amounts of work done and materials furnished under unit price items may differ from the estimated quantities. The basis of payment for work and materials will be the actual amount of work done and materials furnished. Contractor agrees that it will make no claim for damages, anticipated profits, or otherwise on account of any difference between the amounts of work actually performed and materials actually furnished and the estimated amounts therefor.
  
4. EXCAVATION AND TRENCHING. Except where otherwise specified, the unit or lump sum price bid for each item of Work which involves excavation or trenching shall include all costs for such Work. No separate payment shall be made for excavation or trenching. All trenching shall be unclassified as to materials which may be encountered, and trenches shall be unclassified as to depth. All excavation work required for structures shall be unclassified as to materials which may be encountered; such excavation work shall be considered to be a subsidiary obligation of Contractor and the cost of such excavation shall be included in the prices bid for the structures.
  - 4.01. TRENCHING.
    - a. For Transmission Mains. No separate payment shall be made for depths of trenching work required for water mains. All such work shall be considered a subsidiary obligation of Contractor and all costs in connection therewith shall be included in the unit price bid per linear foot of pipe in place.

4.02. STRUCTURE EXCAVATION. All excavation work required for structures, not otherwise paid for as trenching, shall be considered to be a subsidiary obligation of Contractor and the cost of such excavation shall be included in the prices bid for the structures.

5. POWERLINE TEMPORARY SUPPORTS AND SHIELDING. No separate payment will be made for temporary support of power poles or utility poles or for shielding of powerlines from Contractor's operations. All such cost shall be included in the price of the pipeline.

6. UTILITY LOCATIONS & RELOCATIONS. No separate payment will be made for relocation of power poles, telephone poles, fiber optic, underground telephone or any other existing utilities. All such work shall be considered as included in the price of the Work. Additionally, no separate payment will be made for the location of any utilities.

7. RESODDING. No separate payment shall be made in connection with resodding as specified or required. All costs in connection with resodding shall be included in the cost of the pipeline.

8. DEWATERING. No separate payment shall be made in connection with dewatering of the pipeline trench as specified or required. All costs in connection with dewatering shall be included in the cost of the pipeline.

9. WORK WITHIN ROADWAY RIGHT-OF-WAY. No separate payment shall be made in connection with any insurance, training, coordination, traffic control, flagging, inspections or other permitting requirements associated with Work within roadway rights-of-way. All such costs associated with Work within roadway rights-of-way shall be included in the cost of the pipeline.

10. WORK WITHIN RAILROAD RIGHT-OF-WAY. No separate payment shall be made in connection with any insurance, training, coordination, traffic control, flagging, inspections or other permitting requirements associated with Work within railroad right-of-way. All such costs associated with Work within railroad right-of-way shall be included in the cost of the railroad crossing bore & jack.

11. UNIT PRICE. The item numbers listed in Specification Section 00410, Bid Form, are described and referenced below.

Item No. 1 - Mobilization. The lump sum price for mobilization shall include Contractor's preparatory work and operations, including but not limited to those necessary for the movement of personnel, equipment, supplies, and incidentals to the project site; demobilization; and other work and operations which must be performed, or cost incurred, prior to beginning work and at the completion of work at the Site. The lump sum price shall not exceed 3% of the Total Bid.

Items 2a thru 2d – Pipeline. Pipe that is to be paid for on a unit price basis shall be measured for payment on a horizontal plane after installation of the pipe. Where lines are laid to conform to stationed profiles, payment shall be made on linear quantities based on the pipeline stationing as determined by surveys made after installation. No payment will be made for restrained joint pipe installed outside the limits indicated on the Drawings. Polyethylene tube protection shall be included in the unit prices for pipelines where indicated on the Drawings.

The measurement of the length of each line or run of pipe of each size will begin and end at:

- a. The end of the pipe where connected to an existing pipe, fitting, or valve; or at the end of a dead-end run.
- b. The center line intersection of run and branch on tees, crosses, or laterals where a branch line connecting therewith is constructed under this Contract. Where a branch fitting is installed under this Contract, and the branch or connecting line is to be constructed by others at some future date or under another contract, the pay measurement will include the entire laying length of the branch or branches of such fitting.
- c. The measurement of each line of pipe of each size which is to be paid for on a unit price basis will be continuous through, and shall include the full laying lengths of, all fittings and valves installed between the ends of each line; except that the laying lengths of reducers and increasers will be divided equally between the connected pipe sizes.

Pipeline pay items shall include furnishing all materials, equipment, and labor required to install the pipelines complete, as specified and as shown on the Drawings. This item shall also include, but not be limited to, the cost of the following:

- a. All excavation required for pipe installation including the excavation of rock. No separate payment will be made for rock excavation.
- b. All necessary and/or required taps, plugs, polyethylene encasement, conductive tracer, and all other appurtenances not covered under another pay item to properly install and completely test the pipe.
- c. Pipe embedment.

- d. Furnishing, placing, and compacting suitable backfill materials as required.
- e. All erosion control measures for which there is no separate pay item, including temporary fertilizing, seeding, and mulching.
- f. Correcting any damage which may occur when there is no separate pay item.
- g. Restoring the Site to a condition equal to or better than original condition.
- h. Temporary patching of driveways, walkways, roadways, parking lots etc., immediately following construction and maintaining same until permanent repairs are made and maintenance of access throughout construction.
- i. Traffic control measures and signage for which there is no separate pay item.
- j. Locating and working around existing utility locations including removing and replacing existing utility services impacted by the Work and/or as noted on the Drawings.
- k. Protecting existing curb and gutter and asphalt pavement from surface scars or damage. Any damage shall be repaired at no cost to Owner.
- l. All required project signs and removal and replacement of all signage impacted by the Work.
- m. Providing temporary fencing and removing, replacing and relocating existing fencing and gates as required for the installation of the pipeline and/or as noted on the Contract Drawings.
- n. All required wetland matting for construction in wetland areas.
- o. Sheeting and shoring for trench or excavations.
- p. All required easement provisions noted on the Contract Drawings including sign removal, stockpile and replacement; mailbox removal and replacement; temporary gravel parking area; temporary gravel walkway; topsoil removal, stockpile and replacement; additional clearing area outside of easement areas;



relocated sheds and doghouses and any associated fencing; temporary fencing for dog containment; location, protection, and repair of existing irrigation systems; tree protection with one-year inspection and replacement if needed; and removal and replacement of existing backflow preventer and associated piping.

- q. All other items required that are not included in a separate pay item.

Items 3a and 3b – Ductile Iron Fittings. Ductile iron fittings shall be paid for at the unit price bid per pound of weight, including accessories, for each size. The unit price shall include all costs incurred in completing the fitting installation over and above the amount paid for piping in place. The unit price shall include furnishing and installing the fitting, blocking and restraint as required, excavation and backfill not included under piping, and all other costs not included under other Bid items.

For purposes of estimating the total cost of the Work and comparing Bids received, the following weights of fittings were used:

Fitting	Weight (lbs)
36-inch 90 degree bend	2740
36-inch 45 degree bend	2189
36-inch 22.5 degree bend	2105
36-inch 11.25 degree bend	2059
16-inch 90 degree bend	520
16-inch 45 degree bend	430
16-inch 22.5 degree bend	435
16-inch 11.25 degree bend	440
36-inch x 36-inch x 16-inch tee	3003
36-inch Tee	3238
16-inch Tee	675
16-inch x 8-inch tee	570
16-inch x 6-inch tee	550
36-inch x 24-inch Reducer	1902
24-inch X 16-inch Reducer	784
36-inch plug	1250
16-inch plug	205

Items 4a and 4b – Gate Valves. Gate valves in water mains will be paid for at the unit price bid for each size. The unit price shall include all costs incurred in completing the gate valve installation over and above the amount paid

for piping in place. The unit price shall include furnishing and installing the gate valve, valve boxes, flushing connections and valves, concrete stabilization pads and collars; all appurtenances; excavation and backfill not included under piping; and all other costs not included under other bid items.

Items 5a thru 5r – Bore & Jack Crossings. Where trenchless installation is required, each crossing shall be measured for payment horizontally along the longitudinal center line of the casing pipe or pipe installed therein, from end to end of the casing pipe. The unit price bid for casing installed trenchless shall include all costs in connection with excavation and backfilling, casing, jointing materials, installing casing, pits, grouting, casing pipe, restrained carrier pipe, spacers, end closures, geotechnical instrumentation and monitoring where indicated on the Drawings, and all other work for and in connection with the crossings and casing installation, not paid for separately. In addition, all cost in connection with any insurance, training, coordination, traffic control, flagging, or other permitting requirements associated with Work within roadway or railroad right-of-ways shall be included in the unit price along with all costs associated with any Work within railroad right-of-ways.

If bore is unsuccessful or unacceptable, the casing pipe will be grouted with an approved portland cement concrete and no payment of any type will be made for the unsuccessful or unacceptable bore. The Contractor shall shift bore location and submit revised bore alignment to Engineer for approval.

No separate payment will be made for work associated with excavating, uncovering, or supporting existing sanitary sewer pipelines, water mains, gas pipelines, fiber optic, or any other utilities as required for verification of separation from water transmission mains or installation of casing pipe.

Items 6a and 6b – Open Cut Crossings. Where open cut installation of casing pipe is required, each crossing shall be measured for payment horizontally along the longitudinal center line of the casing pipe or pipe installed therein, from end to end of the casing pipe. The unit price bid for casing installed shall include all costs in connection with excavation and backfilling, casing, jointing materials, installing casing, casing pipe, restrained carrier pipe, spacers, end closures and all other work for and in connection with the crossings and casing installation, not paid for separately. In addition, all cost in connection with any training, coordination, traffic control, flagging, or other permitting requirements associated with Work within roadway.

No separate payment will be made for work associated with excavating, uncovering, or supporting existing sanitary sewer pipelines, water mains, gas pipelines, fiber optic, or any other utilities as required for verification of separation from water transmission mains or installation of casing pipe.

Item 7 – Anti-Seep Collar. The unit price bid for anti-seep collars shall include all labor, equipment and materials necessary for the installation of anti-seep collars as shown on the plans. Payment shall be for each anti-seep collar installed.

Item 8a and 8e – Stream/Creek Crossing. The unit price bid for ditch, stream and creek crossings shall apply when rip-rap or erosion control matting are required and shall include all costs of materials and labor for installing the pipelines beneath the streams/creeks over and above the amount paid for piping in place. The cost shall include temporary stream diversion, temporary stream pump around, excavation, backfill, dewatering, riprap, erosion control matting, removal of all diversion materials, and restoration and stabilization of any disturbed areas within confines of stream or stream banks. Unit price shall also include all costs associated with the construction of temporary stream crossings installed per the Drawing details.

Measurement for creek crossing payment shall be made along a horizontal plane stationing along the pipeline to the extents of the riprap/erosion control matting restoration indicated on the Drawings.

Items 9a and 9b – Air Release Valve Manholes. The unit price bid for air release valve manholes shall include furnishing all materials, equipment, and labor required to install the air release valve and manhole including excavation and backfill , precast manhole and aluminum access hatch and top slab as indicated on the Drawings, all piping, fittings, isolation valves, pipe supports, air release valve, vent piping, stone, filter fabric, stabilizing pads, and all other appurtenances necessary for a complete system as specified and as shown on the Drawings. The unit price bid shall be for each ARV manhole installed and shall be over and above that paid for piping in place.

Items 10a and 10b – Manual Air Release Valves. The unit price bid for manual air release valves shall include furnishing all materials, equipment, and labor required to install the manual air release valve including excavation and backfill , concrete rings and blocking as indicated on the Drawings, all piping, fittings, valves and valve boxes, tapping saddles, and all other appurtenances necessary for a complete system as specified and as shown on the Drawings. The unit price bid shall be for each manual ARV installed and shall be over and above that paid for piping in place.

Items 11a and 11b – Blow Offs. The unit price bid blow offs shall include furnishing all materials, equipment, and labor required to install the blow offs including excavation and backfill, tangential outlet or tapped plug, valves, restrained blow off piping, concrete pad, and riprap drainage channel, and all other appurtenances necessary for a complete blow off as specified and as shown on the Drawings.

Item 12 – Connection to Existing 36-inch Transmission Main (Station 10+00). Connection to existing 36-inch water transmission main will be paid for at the lump sum price bid. The lump sum price shall include all costs incurred for making the connection over and above the price of the connecting piping in place and restraint which will be paid for separately. The lump sum price shall include removal and disposal of the existing restrained joint plug and corp stop, and restrained connection to the existing piping including all excavation and backfilling work and all other costs not included under other bid items.

Item 13 – Existing 16” Water Main Connection (Station 58+21). The lump sum price stated in the bid shall include all materials, equipment, labor and all other incidental expenses associated with the connection to the existing water main, installation of the new 16” water main, fittings, valves, thrust collar and appurtenances as well as the connection to the 36” water main as shown on the Drawings. The lump sum price shall include excavation, excavation of rock, dewatering, furnishing and installing pipe, valves, and appurtenances, pipe embedment, and backfill. The measurement for payment shall be lump sum for the connection to the existing water main, installation of the new water main and connection to the 36” x 16” tee, complete in place, tested and accepted.

Item 14 – Existing 16” Water Main Connection (W/L Station 1+01.94). The lump sum price stated in the bid shall include all materials, equipment, labor and all other incidental expenses associated with the connection to the existing water main, installation of the 16” water main, fittings, valves, thrust collar and appurtenances as well as the connection to the 16” water main as shown on the Drawings. The lump sum price shall include excavation, excavation of rock, dewatering, furnishing and installing pipe, valves, and appurtenances, pipe embedment, and backfill. The measurement for payment shall be lump sum for the connection to the existing water main, installation of the new water main and connection to the 16” x 16” tee, complete in place, tested and accepted.

Item 15 – Existing 16” Water Main Connection (Station 133+03). The lump sum price stated in the bid shall include all materials, equipment, labor and all other incidental expenses associated with the connection to the existing water main, installation of the 16” water main, fittings, valves, thrust collar and appurtenances as well as the connection to the 36” water main as shown on the Drawings. The lump sum price shall include excavation, excavation of rock, dewatering, furnishing and installing pipe, valves, and appurtenances, pipe embedment, and backfill. The measurement for payment shall be lump sum for the connection to the existing water main, installation of the new water main and connection to the 36” x 16” tee, complete in place, tested and accepted.

Item 16 – Existing 16” Water Main Connection (Station 165+37). The lump sum price stated in the bid shall include all materials, equipment, labor and all other incidental expenses associated with the connection to the existing water

main, installation of the 16" water main, fittings, valves, thrust collar and appurtenances as well as the connection to the 36" water main as shown on the Drawings. The lump sum price shall include excavation, excavation of rock, dewatering, furnishing and installing pipe, valves, and appurtenances, pipe embedment, and backfill. The measurement for payment shall be lump sum for the connection to the existing water main, installation of the new water main and connection to the 36" x 16" tee, complete in place, tested and accepted.

Item 17 – Existing 6" Water Main Connection (Station 275+95). The lump sum price stated in the bid shall include all materials, equipment, labor and all other incidental expenses associated with the installation of the 6" water main from and including the connection to the 16" x 6" tee to and including the interconnection with the existing 6" water main complete as shown on the Drawings. The lump sum price shall include excavation, excavation of rock, dewatering, furnishing and installing pipe, fittings, valves, fire hydrant assembly including piping, tee, blocking, restraint and valve, appurtenances, pipe embedment, backfill and site restoration. The measurement for payment shall be lump sum completed in place, tested and accepted.

Item 18 – Existing 8" Water Main Connection (Station 284+51). The lump sum price stated in the bid shall include all materials, equipment, labor and all other incidental expenses associated with the installation of the 8" water main from and including the connection to the 16" x 8" tee to and including the interconnection with the existing 8" water main complete as shown on the Drawings. The lump sum price shall include excavation, excavation of rock, bore and jack, dewatering, furnishing and installing pipe and casing pipe, fittings, valves, thrust collar, appurtenances, pipe embedment, backfill and site restoration. The lump sum price shall also include all costs associated with plugging the existing 8" waterline and installing thrust collar. The measurement for payment shall be lump sum completed in place, tested and accepted.

Item 19a, 19b and 19c – Abandon Water Main. The lump sum price stated in the bid shall include all materials, equipment, labor and all other incidental expenses associated with the abandonment of the water main including cutting and capping the existing line to be abandoned with concrete (or MJ plug, as needed) on all ends of each section to be abandoned, closing existing valves and removing valve boxes, and removing existing fire hydrant assemblies. The lump sum price shall include excavation, excavation of rock, dewatering, furnishing and installing all materials, all disposal, backfill and restoring grade to existing state. The measurement for payment shall be lump sum for the abandonment of the water mains complete in place.

Item 20 – Remove and Replace Existing 8" & 12" Gravity Sewer. Gravity sewer shall be removed and replaced at the existing grades as shown on the Drawings. Payment will be made on the basis of the unit price bid. Measurement

for payment shall be the actual number of linear feet of pipe removed and replaced, measured horizontally along the centerline of the pipe. The unit price bid per linear foot for construction of the Gravity Sewers shall include all of the Contractor's cost of the complete construction of Gravity Sewers including materials, couplings, bypass pumping, and CCTV inspection, exclusive of items provided for elsewhere in the Bid Form.

Item 21 - Asphalt Pavement Removal and Replacement. Pavement removal and replacement shall be measured for payment horizontally along the center line of the pipe to the edges of the existing pavement; or, where the edge of the existing pavement is not clearly defined, to the edge of the pavement replacement. The maximum width considered for payment shall be 20 feet. Where centerline of pipe is more than 4 feet horizontally from edge of pavement and not beneath pavement, no payment will be made under this item.

In areas where parking lots are noted on the Drawings to be removed and replaced, the pavement removal and replacement shall be measured for payment based on the area noted to be removed and replaced.

The Unit Prices Bid for pavement removal and replacement shall include all costs in connection therewith, including cutting, removal, and disposal of old pavement; construction of new pavement; and all extra compaction effort required for backfill beneath pavement. Cost shall also include temporary and permanent stripping where needed.

Item 22 – Fire Hydrant Assembly. The unit price for fire hydrant assembly shall include furnishing all materials, equipment, and labor required to install the fire hydrant including excavation and backfill, 6" piping, valves, restraints and blocking, hydrant, connection to and including the mainline tee, and all other appurtenances necessary for a complete fire hydrant assembly as specified and as shown on the Drawings.

Item 23 – Short Side Water Service. Short side water services shall be installed by open cut at the grades and locations shown on the Drawings. Payment will be made on the basis of the unit price bid. The unit price bid for construction of the short side water service shall include all of the Contractor's cost of the complete construction of the water service, exclusive of the items provided elsewhere on the Bid Form.

Item 24 – Long Side Water Service. Long side water services shall be installed by trenchless methods where services cross an existing road at the grades and locations shown on the Drawings. Payment will be made on the basis of the unit price bid. The unit price bid for construction of the long side water service shall include all of the Contractor's cost of the complete construction of the water service, exclusive of the items provided elsewhere on the Bid Form.

Items 25a and 25b – Driveway Crossings. The unit price bid for driveway crossings shall be measured for payment horizontally along the center line of the pipe and to the edge of the existing driveway or, where the edge of the existing driveway is not clearly defined, to the edge of the driveway replacement. The maximum width considered for payment shall be 20 feet.

The unit price bid for concrete driveway repair shall include all costs involved in cutting and removing existing concrete and all labor and materials including, but not limited to, subgrade, stone, base courses, expansion joint material, and new concrete, required to replace the concrete driveway.

Item 26 – Miscellaneous Concrete. Concrete for encasement or blocking of pipe and fittings not included in other unit price items will be measured for payment as the actual volume of concrete placed within the limits as indicated or specified.

Concrete for arch encasement of pipe shall be computed using the dimensions shown for arch encasement on Figure 1-02202, Embedments for Conduits in Section 02202.

Concrete for total encasement shall be computed using the maximum allowable trench width (or pipe OD plus 24 inches where no maximum is specified), the minimum clear depth below the pipe, and the minimum cover over the pipe, less the volume occupied by the pipe itself.

The Unit Price Bid for miscellaneous concrete shall include concrete, reinforcing steel (when required), forms, finishing, curing, and all other work or materials required to complete the concrete work.

Quantities for payment shall be approved by Engineer's representative at the time the work is done.

Item 27 – Curb & Gutter Removal & Replacement. The unit prices bid for curb and gutter removal and replacement shall include all costs involved in removing curb and gutter and all labor and materials required to replace the curb and gutter to match existing.

Measurement for payment for curb and gutter removal and replacement shall be on a linear foot basis and shall include only the length removed to perform the work to nearest joint.

Item 28 – Trench Stabilization Stone. Trench stabilization stone shall include furnishing all materials, equipment, and labor required to install stabilization stone as required and approved by Engineer.

Cost for stabilization stone includes removal and disposal of any unsuitable material from beneath the pipe and replacement with stabilization stone material as required by Engineer. Embedment material is paid elsewhere and is not a part of this unit price item.

Quantities for payment shall be approved by the Engineer's representative at the time the work is done.

Item 29 – Erosion Control. Erosion control shall include the cost of all erosion control measures required. The unit prices bid shall include providing and installing the measures prior to the start of any land disturbance, maintenance of the measures until the disturbed areas are stabilized with permanent ground cover or grass, and removal of the temporary measures. Costs shall be paid on a unit price basis for each item providing controls as shown on the Drawings or have been approved by Engineer.

- A. Construction Entrances. Payment for this item shall be per entrance constructed in accordance with the detail on the Drawings including concrete washout pits.
- B. Stone Outlet. Payment for this item shall be per stone outlet constructed in accordance with the detail on the Drawings.
- C. Silt Fence. Payment for this item shall be per linear foot of silt fence installed in accordance with the detail on the Drawings.
- D. Half-Ring Inlet Protection. Payment for this item shall be per inlet pipe protected in accordance with the detail on the Drawings.
- E. Erosion Control Matting. Payment for this item shall be per square yard of matting required other than that indicated as a part of the stream crossings.
- F. Wattle. Payment for this item shall for each wattle installed in accordance with the detail on the Drawings.

Item 30 – Pipeline Pressure Leakage Testing. The unit prices bid for pipeline testing shall include all costs associated with pressure testing of the pipeline as required by the Contract Documents. This payment shall be made on a linear foot basis along the pipeline route. Measurements shall be consistent with the description of measurement for the length of pipeline installed contained elsewhere in this section. All costs associated with pipeline testing including, but not limited to, connections required for filling, special fittings, pressure gauges, additional blow offs, water required for filling pipeline, and pressurizing the pipeline shall be included in this unit price.



Item 31 – Cleaning and Disinfection of Pipelines. The lump sum price for cleaning and disinfection of pipelines shall include all costs associated with cleaning and disinfection of the pipeline in accordance with the Contract Documents and all Laws and Regulations governing potable water supply. All costs associated with cleaning and disinfection including, but not limited to, connections required for filling not already covered in this section, special fittings for sample collection and chlorine injection, water required for filling pipeline not already covered in this section, sufficient quantities of chlorine disinfectant, all costs associated with bacteriological testing to ensure proper disinfection, and any costs associated with de-chlorination of water prior to discharge shall be included in this lump sum price. Payment for this bid item shall be made as a percentage of the total pipeline cleaned and disinfected.

Item 32 – Fertilizing and Seeding. Fertilizing and seeding shall include furnishing all materials, equipment, and labor required to prepare the seed bed, fertilize, seed, and mulch the entire width of the easement, plant site, and any other disturbed areas. Payment will be made on a linear foot of pipeline basis for all areas that pipeline crosses requiring seeding. Generally, this should exclude the paved and graveled areas and creeks.

Item 33 – Clearing & Grubbing. The lump sum for Clearing and Grubbing shall include the removal and disposal of all trees, stumps, brush, and shrubs within the permanent and temporary easements shown on the Drawings and/or as specifically noted on the Drawings as required for the construction of the Work. Clearing and Grubbing in temporary easement areas shall be limited to the area necessary to perform the Work. This bid item shall also include protection of trees and shrubs noted on the plans to be saved and protection of all trees, shrubs and plants outside the permanent and temporary easement areas

Item 34 – Landscaping. The lump sum for landscaping shall include the replacement of landscape and trees where noted on the Drawings. Landscaping shall include replacing all plants, bedding, and materials with like kind as required to restore the landscape to the pre-construction condition. Landscaping shall also include the replacment of trees with like-kind where noted on the Drawings. Replacement trees shall be 15 gallon size “starter trees” unless otherwise noted on the Drawings. Landscaping shall include furnishing all materials, equipment, and labor required to excavate and install new materials including preparing the planting bed, fertilizer, coordination with Owner and property owner regarding location, and providing all recommended care required to establish the new plantings including watering, maintenance and fertilizer through final completion. All trees and container plants shall be guaranteed through a plant establishment period of 1 year after installation. Replacement of any trees or container plants during the plant establishment period shall be included in the lump sum price for landscaping. Payment for this bid item shall be made as a percentage of the total pipeline installed.

Item 35a, 35b and 35c – Additional Restorative Planting. The lump sum for Additional Restorative Planting shall include the replacement of landscape and trees where noted on the Drawings for the lots indicated in the bid items. Additional Restorative Planting shall include providing and installing all plants and bedding required in the planting schedules noted on the Drawings. This bid shall include furnishing all materials, equipment, and labor required to excavate and install new materials including preparing the planting bed, fertilizer, coordination with Owner and property owner regarding location, and providing all recommended care required to establish the new plantings including watering, maintenance and fertilizer through final completion. All trees and container plants shall be guaranteed through a plant establishment period of 1 year after installation. Replacement of any trees or container plants during the plant establishment period shall be included in the lump sum price for landscaping.

Item 36 – Magnetic Markers. The lump sum for Magnetic Markers shall include all materials and installation required to install magnetic markers at all horizontal bends and ends of casing pipe for all piping installed as part of the Work. The magnetic markers shall be InfraMarker IMDEEP-1 markers, or equal and shall be blue in color. The markers shall be installed as close as possible to the centerline of the bend or end of casing pipe, no deeper than 4' below grade or as recommended by manufacturer. At the completion of the Work, the Engineer's surveyor will locate the magnetic markers. If any magnetic markers can not be located, the Contractor shall perform all work necessary to either install a missing marker or to determine the location of the marker including excavation, if needed. All costs associated with the materials, installation, and location coordination shall be included in the lump sum bid price. Payment for this bid item shall be made as a percentage of the total pipeline installed.

End of Section

Section 01070

ABBREVIATIONS AND ACRONYMS

1. LIST OF ABBREVIATIONS. Abbreviations for standards and organizations used in the Contract Documents are defined as follows:

AA	Aluminum Association
AABC	Associated Air Balance Council
AAMA	Architectural Aluminum Manufacturers Association
AASHTO	American Association of State Highway and Transportation Officials
ABMA	American Bearing Manufacturers Association
ACI	American Concrete Institute
ACPA	American Concrete Pipe Association
AEIC	Association of Edison Illuminating Companies
AFBMA	Antifriction Bearing Manufacturers Association now recognized as the ABMA
AFPA	American Forest & Paper Association
AGA	American Gas Association
AGMA	American Gear Manufacturers Association
AHA	American Hardboard Association
AHRI	Air-Conditioning, Heating and Refrigeration Institute
AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute
AITC	American Institute of Timber Construction
AMCA	Air Movement and Control Association International
ANSI	American National Standards Institute
APA	Engineered Wood Association (formerly American Plywood Association)
API	American Petroleum Institute
AREMA	American Railway Engineers and Maintenance-of-Way Association
ASAHC	American Society of Architectural Hardware Consultants
ASCE	American Society of Civil Engineers
ASHRAE	American Society of Heating, Refrigerating, and Air-Conditioning Engineers
ASME	American Society of Mechanical Engineers
ASSE	American Society of Sanitary Engineers
ASTM	ASTM International
AWG	American Wire Gauge
AWI	Architectural Woodwork Institute
AWPA	American Wood-Preservers' Association
AWS	American Welding Society

AWWA	American Water Works Association
BHMA	Builders Hardware Manufacturers Association
BIA	Brick Institute of America (formerly SCPI)
CDA	Copper Development Association
CISPI	Cast Iron Soil Pipe Institute
CMAA	Crane Manufacturers Association of America
CRA	California Redwood Association
CRSI	Concrete Reinforcing Steel Institute
CS	Commercial Standard (U.S. Department of Commerce)
DHI	Door and Hardware Institute
DIPRA	Ductile Iron Pipe Research Association
EEI	Edison Electric Institute
EJCDC	Engineers' Joint Contract Documents Committee
EPA	Environmental Protection Agency
FCC	Federal Communications Commission
FCI	Fluid Controls Institute
Fed Spec	Federal Specification
FGMA	Flat Glass Marketing Association
FHWA	Federal Highway Administration
FIA	Factory Insurance Association
FM	Factory Mutual
FSA	Fluid Sealing Association
HEI	Heat Exchange Institute
HMI	Hoist Manufacturers Institute
HPMA	Hardwood Plywood Manufacturers Association
HTI	Hand Tools Institute
I-B-R	Institute of Boiler and Radiator Manufacturers
IEEE	Institute of Electrical and Electronics Engineers
IBC	International Building Code
IES	Illuminating Engineering Society
IFI	Industrial Fasteners Institute
IPCEA	Insulated Power Cable Engineers Association
IRI	Industrial Risk Insurers
ISA	International Society of Automation
LEED	Leadership in Energy and Environmental Design

MHI	Materials Handling Institute
MIL	Military Specification
MMA	Monorail Manufacturers Association
MSS	Manufacturers Standardization Society of Valve and Fitting Industry
NAAMM	National Association of Architectural Metals Manufacturers
NACE	NACE International
NBBPVI	National Board of Boiler and Pressure Vessel Inspectors
NBS	See NIST
NCSPA	National Corrugated Steel Pipe Association
NEBB	National Environmental Balancing Bureau
NEC	National Electrical Code
NECA	National Electrical Contractors Association
NEII	National Elevator Industry, Inc.
NEMA	National Electrical Manufacturers Association
NFPA	National Fire Protection Association
NIST	National Institute of Standards and Technology (formerly NBS)
NLA	National Lime Association
NPC	National Plumbing Code
NPT	National Pipe Thread
NRMCA	National Ready Mixed Concrete Association
NSC	National Safety Council
NSF	NSF International (formerly National Sanitation Foundation)
NTMA	National Terrazzo and Mosaic Association
NWMA	National Woodwork Manufacturers Association
OSHA	Occupational Safety and Health Administration
PCA	Portland Cement Association
PCI	Precast/Prestressed Concrete Institute
PS	Product Standard
RIS	Redwood Inspection Service
SAE	SAE International
SDI	Steel Door Institute
SFPA	Southern Forest Products Association
SI	Système International des Unités (International System of Units)
SIGMA	Sealed Insulating Glass Manufacturers Association
SJI	Steel Joist Institute
SMA	Screen Manufacturers Association

SMACNA	Sheet Metal and Air Conditioning Contractors National Association
SPFA	Steel Plate Fabricators Association
SPI	Society of the Plastics Industry
SPTA	Southern Pressure Treaters Association
SSFI	Scaffolding, Shoring & Forming Institute, Inc
SSPC	SSPC: The Society for Protective Coatings
TABB	Testing, Adjusting, and Balancing Bureau
UL	Underwriters' Laboratories
USBR	U.S. Bureau of Reclamation
USGBC	U.S. Green Building Council
WEF	Water Environment Federation

End of Section

Section 01300

SUBMITTAL PROCEDURES

1. SHOP DRAWINGS AND ENGINEERING DATA.

1.01. General. Shop Drawings and engineering data (submittals) covering all equipment and all fabricated components and building materials which will become a permanent part of the Work under this Contract shall be submitted to Engineer for review, as required. Submittals shall verify compliance with the Contract Documents, and shall include drawings and descriptive information in sufficient detail to show the kind, size, arrangement, and the operation of component materials and devices; the external connections, anchorages, and supports required; the performance characteristics; and dimensions needed for installation and correlation with other materials and equipment.

Each submittal shall cover items from only one section of the specification unless the item consists of components from several sources. Contractor shall submit a complete initial submittal including all components. When an item consists of components from several sources, Contractor's initial submittal shall be complete including all components.

All submittals, regardless of origin, shall be approved by Contractor and clearly identified with the name and number of this Contract, Contractor's name, and references to applicable specification paragraphs and Contract Drawings. Each copy of all submittals, regardless of origin, shall be stamped or affixed with an approval statement of Contractor. Each submittal shall indicate the intended use of the item in the Work. When catalog pages are submitted, applicable items shall be clearly identified and inapplicable data crossed out. The current revision, issue number, and date shall be indicated on all drawings and other descriptive data.

Contractor shall be solely responsible for the completeness of each submittal. Contractor's stamp or affixed approval statement of a submittal, per Figure 1-01300, is a representation to Engineer that Contractor accepts sole responsibility for determining and verifying all field measurements, quantities, dimensions, specified performance and design criteria, installation requirements, materials, catalog numbers, and similar information with respect thereto, and that Contractor has reviewed and coordinated each submittal with other Shop Drawings and with the requirements of the Work and the Contract Documents.

All deviations from the requirements of the Contract Documents shall be identified as deviations on each submittal and shall be tabulated in Contractor's letter of transmittal using Figure 2-01300. Such submittals shall, as pertinent to

the deviation, indicate essential details of all changes proposed by Contractor (including modifications to other facilities that may be a result of the deviation) and all required piping and wiring diagrams.

For electronic submittals, drawings and the necessary data shall be submitted electronically to Engineer and as specified below. Submittal documents shall be in color to facilitate use of red line markups. All electronic files shall be in Portable Document Format (PDF) as generated by Adobe Acrobat Professional Version 7.0 or higher. The PDF file(s) shall be fully indexed using the Table of Contents, searchable with thumbnails generated. PDF images must be at a readable resolution. For most documents, they should be scanned or generated at 300 dots per inch (dpi). Use of higher resolution is acceptable with Owner and Engineer approval. Optical Character Recognition (OCR) capture must be performed on these images so that text can be searched, selected and copied from the generated PDF file. The PDF documents shall have a bookmark created in the navigation frame for each major entry ("Section" or "Chapter") in the Table of Contents. Thumbnails shall be generated for each page or graphic in the PDF file.

The opening view for each PDF document shall be as follows:

Initial View: Bookmarks and Page

Magnification: Fit In Window

The file shall open to Contractor's transmittal letter, with bookmarks to the left. The first bookmark shall be linked to the Table of Contents.

PDF document properties shall include the submittal number for the document title and Contractor's name for the author.

Electronic submittal file sizes shall be limited to 10 MB. When multiple files are required for a submittal the least number of files possible shall be created.

Contractor shall post submittals and retrieve Engineer's submittal review comments through the Project website accessible through the Internet. Instruction on procedures for posting and retrieving submittals will be provided after award of the Contract.

Facsimiles (fax) will not be acceptable. Submittals will not be accepted from anyone but Contractor. Submittals shall be consecutively numbered in direct sequence of submittal and without division by subcontracts or trades.

1.02. Engineer's Review of Submittals. Engineer's review of submittals covers only general conformity to the Drawings and Specifications, external connections, and dimensions that affect the layout; it does not indicate thorough review of all



dimensions, quantities, and details of the material, equipment, device, or item covered. Engineer's review shall not relieve Contractor of sole responsibility for errors, omissions, or deviations in the drawings and data, nor of Contractor's sole responsibility for compliance with the Contract Documents.

Engineer's submittal review period shall be 21 consecutive calendar days and shall commence on the first calendar day following receipt of the submittal or resubmittal in Engineer's office. The time required to mail the submittal or resubmittal back to Contractor shall not be considered a part of the submittal review period.

When the drawings and data are returned with review status "NOT ACCEPTABLE" or "RETURNED FOR CORRECTION", the corrections shall be made as instructed by Engineer. If submittals are made electronically, the corrected drawings and data shall be resubmitted through the Project website. Resubmittals by facsimile or e-mail will not be accepted. When the drawings and data are returned with review status "EXCEPTIONS NOTED", "NO EXCEPTIONS NOTED", or "RECORD COPY", no additional copies need be furnished unless specifically requested by Engineer.

1.03. Resubmittal of Shop Drawings and Data. Contractor shall accept full responsibility for the completeness of each resubmittal. Contractor shall verify that all corrected data and additional information previously requested by Engineer are provided on the resubmittal.

When corrected copies are resubmitted, Contractor shall direct specific attention to all revisions in writing and shall list separately any revisions made other than those called for by Engineer on previous submittals. Requirements specified for initial submittals shall also apply to resubmittals. Resubmittals shall bear the number of the first submittal followed by a letter (A, B, etc.) or a unique identification that indicates the initial submittal and correct sequence of each resubmittal.

If more than one resubmittal is required because of failure of Contractor to provide all previously requested corrected data or additional information, Contractor shall reimburse Owner for the charges of Engineer for review of the additional resubmittals. This does not include initial submittal data such as shop tests and field tests that are submitted after initial submittal.

Resubmittals shall be made within 30 days of the date of the letter returning the material to be modified or corrected, unless within 14 days Contractor submits an acceptable request for an extension of the stipulated time period, listing the reasons the resubmittal cannot be completed within that time.

The need for more than one resubmittal, or any other delay in Engineer's review of submittals, will not entitle Contractor to extension of the Contract Times unless delay of the Work is the direct result of a change in the Work authorized by a Change Order or failure of Engineer to review and return any submittal to Contractor within the specified review period.

2. OPERATION AND MAINTENANCE DATA AND MANUALS. Adequate operation and maintenance information shall be supplied for all equipment requiring maintenance or other attention. The equipment Supplier shall prepare a Project specific operation and maintenance manual for each type of equipment indicated in the individual equipment sections or the equipment schedule.

Unless otherwise agreed by Engineer, the operation and maintenance manual for each type of equipment shall only be submitted for review following completion of review of all shop drawings and engineering data pertaining to that equipment.

Parts lists and operating and maintenance instructions shall be furnished for other equipment not listed in the individual equipment sections or the equipment schedule.

Operation and maintenance manuals shall include the following:

- a. Equipment function, normal operating characteristics, and limiting conditions.
- b. Assembly, installation, alignment, adjustment, and checking instructions.
- c. Operating instructions for startup, routine and normal operation, regulation and control, shutdown, and emergency conditions.
- d. Lubrication and maintenance instructions.
- e. Guide to troubleshooting.
- f. Parts lists and predicted life of parts subject to wear.
- g. Outline, cross section, and assembly drawings; engineering data; and wiring diagrams.
- h. Test data and performance curves, where applicable.

The operation and maintenance manuals shall be in addition to any instructions or parts lists packed with or attached to the equipment when delivered, or which may be required by Contractor.

Three hard copies of each manual shall be submitted to Engineer prior to the date of shipment of the equipment. When the O&M manuals are returned with the review status "RETURNED FOR CORRECTION", the corrections shall be made as instructed by Engineer, and two copies of the corrected portion(s) and one complete corrected copy of the O&M manual returned to Engineer. After review by Engineer is complete, three hard copies and one electronic copy of each operation and maintenance manual shall be prepared and delivered to Engineer not later than 30 days prior to placing the equipment in operation. The electronic copy shall be submitted through the Project website, and will be reviewed for content and organization and assigned a review status by Engineer. When corrections are required, a corrected version of the electronic copy shall be resubmitted. Procedures for submission of the electronic copy will be provided after award of the Contract. When review of the electronic copy by Engineer is complete, three copies of each electronic O&M manual shall be delivered on CD-ROM to Engineer. Each CD shall contain only one copy of one manual.

All material shall be marked with Project identification, and inapplicable information shall be marked out or deleted.

Shipment of equipment will not be considered complete until all required manuals and data have been received.

2.01. Hard Copy Operation and Maintenance Manuals. Hard copies submitted for review shall be temporarily bound in heavy paper covers bearing suitable identification. All manuals and other data shall be printed on heavy, first quality 8-1/2 x 11 inch paper, with standard three-hole punching. Drawings and diagrams shall be reduced to 8-1/2 x 11 inches or 11 x 17 inches. Where reduction is not practicable, larger drawings shall be folded separately and placed in envelopes, which are bound into the manuals. Each envelope shall be suitably identified on the outside. Each volume containing data for three or more items of equipment shall include a table of contents and index tabs. The final hard copy of each manual shall be prepared and delivered in substantial, permanent, three-ring or three-post binders with a table of contents and suitable index tabs.

2.02. Electronic Operation and Maintenance Manuals. Electronic manuals shall be in Adobe Acrobat's Portable Document Format (PDF), and shall be prepared at a resolution between 300 and 600 dots per inch (dpi), depending on document type. Optical Character Recognition (OCR) capture shall be performed on these documents. OCR settings shall be performed with the "original image with hidden text" option in Adobe Acrobat Exchange.

File size shall be limited to 10 MB. A single PDF file greater than 10 MB may only be submitted if acceptable to Owner. When multiple files are required the least number of files possible shall be created. File names shall be in the format

OMXXXXX-YYYYZ-V.pdf, where XXXXX is the five digit number corresponding to the specification section, YYY is a three digit O&M manual number, e.g. 001, Z is the letter signifying a resubmittal, A, B, C, etc., and V is a number used only when more than one 10 MB file is required for an O&M manual.

Documents prepared in PDF format shall be processed as follows:

1. Pages shall be searchable (processed for optical character recognition) and indexed when multiple files are required.
2. Pages shall be rotated for viewing in proper orientation.
3. A bookmark shall be provided in the navigation frame for each entry in the Table of Contents.
4. Embedded thumbnails shall be generated for each completed PDF file.
5. The opening view for PDF files shall be as follows:
  - Initial View: Bookmarks and Page
  - Page Number: Title Page (usually Page 1)
  - Magnification: Set to Fit in Window
  - Page: Single Page
6. Where the bookmark structure is longer than one page the bookmarks shall be collapsed to show the chapter headings only.
7. When multiple files are required the first file of the series (the parent file) shall list every major topic in the Table of Contents. The parent file shall also include minor headings bookmarked based on the Table of Contents. Major headings, whose content is contained in subsequent files (children) shall be linked to be called from the parent to the specific location in the child file. The child file shall contain bookmark entries for both major and minor headings contained in the child file. The first bookmark of any child file shall link back to the parent file and shall read as follows "Return to the *Equipment Name* Table of Contents", e.g. Return to the Polymer Feed System Table of Contents.
8. Drawings shall be bookmarked individually.
9. Files shall be delivered without security settings to permit editing, insertion and deletion of material to update the manual provided by the manufacturer.

2.03. Labeling. As a minimum, the following information shall be included on all final O&M manual materials, including CD-ROM disks, jewel cases, and hard copy manuals:

Equipment name and/or O&M title spelled out in complete words.

Project Name.

Owner Project/Contract Number.

Specification Section Number. Example: "Section 15500"

Manufacturer's name.

File Name and Date.

For example:

Air Release Valve Operation and Maintenance Manual  
853W Zone Improvements – Phase 1  
Union County/Contract No. \_\_\_\_\_  
Specification Section 11110  
Manufacturer  
OM11110-001.pdf, 5/05/19

End of Section



Section 01310

CONSTRUCTION PROGRESS SCHEDULE

1. GENERAL OVERVIEW. A Progress Schedule shall be used to control the Work and to provide a definitive basis for determining project progress. The Progress Schedule shall be prepared, maintained and updated by Contractor and historical dates agreed monthly with Engineer. Contractor shall submit a preliminary Progress Schedule and a Progress Schedule for acceptance by Engineer. These schedules shall be Contractor's working schedules and shall be used to plan, organize and execute the Work, record and report actual performance and progress, and show how Contractor plans to complete all remaining Work as of the end of each progress report period.

The Progress Schedule shall comprise all the detailed construction-related activities using the critical path method (CPM). The Progress Schedule shall provide sufficient detail and clarity to reflect the intricacies and interdependencies of activities so Contractor can plan, schedule, monitor, control and report on the progress of his work. In addition, it shall provide Engineer and Owner a tool to monitor and follow the progress for all phases of the Work.

2. PRE-CONSTRUCTION SCHEDULING CONFERENCE. The Engineer will conduct a pre-construction scheduling conference with Contractor to review requirements for the schedules including Schedule of Values, cost-loading and schedule configuration. The conference shall be conducted sufficiently early to allow Contractor to submit the preliminary Progress Schedule within ten days of the Effective Date of the Contract.

At this meeting, Contractor shall explain in detail the procedure to be used to develop the schedule activity cost-loading or Schedule of Values and cash flow. This procedure is subject to the review and acceptance of Engineer.

3. PRELIMINARY PROGRESS SCHEDULE. Following the pre-construction scheduling conference but within ten calendar days after the Effective Date of the Contract, Contractor shall submit a preliminary Progress Schedule for review by Engineer. The preliminary Progress Schedule shall show detailed construction-related activities for the first 45 days of the project. The remainder of the Contract activities shall be shown as summary bars within the milestones of the Work. If Engineer has comments on the preliminary Progress Schedule, Contractor shall make the necessary changes and resubmit it within ten calendar days. No progress payments will be made during the period specified above for the preliminary Progress Schedule until the preliminary Progress Schedule has been accepted by Engineer.

The preliminary Progress Schedule shall:

- a. Illustrate a feasible schedule for completion of the Work within the Contract Times and Milestones specified.
- b. Provide an elementary example of the schedule in the format to be used for the Progress Schedule.
- c. Include the activity code structure as described in Paragraph 19 of this specification.

3.01. Preliminary Progress Schedule Submittal Format: Contractor shall submit an electronic version of the preliminary Progress Schedule. A brief narrative shall accompany the submittal, describing Contractor's scheduling approach to the project. The narrative shall include a description of the Contract milestones, approach for construction activities during the period of the preliminary Progress Schedule, description of the general approach of the activities for the work beyond the preliminary Progress Schedule period, a description of the project's critical path, identification of critical long-lead submittals, and planned outages. The narrative shall also incorporate activity codes, calendars, weather days, milestone constraints, and work breakdown structure in accordance with the requirements specified herein.

4. PROGRESS SCHEDULE The Progress Schedule comprises all the construction-related activities for the Work and shall show the order in which Contractor proposes to carry out the work. Contractor shall include milestones, coordination necessitated by limited access and available work areas, and the availability and use of manpower, material and equipment. Contractor shall use the Progress Schedule to plan, schedule and coordinate the Work including activities of subcontractors, equipment vendors, and suppliers.

The Progress Schedule shall be to the level of detail acceptable to Engineer, and shall include the following:

- a. Organization and structural breakdown of the Project;
- b. Milestones and completion dates;
- c. Type of work to be performed and the labor trades involved;
- d. Purchase, manufacture and delivery activities for major materials and equipment;
- e. Preparation, submittal, and acceptance of shop drawings and material samples;



- f. Deliveries of owner-furnished equipment and/or materials;
- g. Acceptances required by regulatory agencies and/or other third parties;
- h. Assignment of responsibility for each activity;
- i. Access requirements to work areas;
- j. Identification of interfaces and dependencies with preceding, concurrent and follow-on contractors;
- k. Tests, submittal of test reports and acceptance of test results;
- l. Planning for phased or total acceptance by Owner; including start up and commissioning;
- m. Identification of any manpower, material and equipment restrictions.
- n. Sequence of construction to maintain plant operations;
- o. Planned outages.

The activities included in the Progress Schedule shall be defined in work days. Durations shall be based on the labor (crafts), equipment, and materials required to perform each activity on a normal workday basis. Activity durations shall be 20 working days or less except in the case of non-construction activities such as procurement of materials, delivery of equipment, and concrete curing. All durations shall be the result of definitive manpower and resource planning by Contractor to perform the Work, in consideration of contractually defined on-site work conditions and Contractor's planned means and methods.

When the Progress Schedule is accepted by Engineer, Engineer will save a copy of the Progress Schedule as the baseline schedule, and will use it for analysis of Contractor's progress.

Contractor shall update the Progress Schedule monthly.

5. ELECTRONIC PROGRESS SCHEDULE FORMAT AND REPORTING. The Progress Schedule shall be created using Primavera P6 scheduling software. Contractor shall use Engineer's file-naming format throughout the project.

- a. Electronic schedule files shall be saved with .XML or .XER file extensions.



7. RESOURCE-LOADING. Not used.

8. COORDINATING PROGRESS SCHEDULE WITH OTHER CONTRACT SCHEDULES. Not used.

9. SUBMITTALS. The Progress Schedule and associated reports shall be submitted to Engineer for acceptance within the period of the preliminary Progress Schedule specified herein. If the Progress Schedule is not submitted, no progress payments will be made after the due date until the Progress Schedule has been submitted.

Printouts and electronic layouts required as part of the Progress Schedule submittal and monthly updates are as follows:

- a. Summary Schedule: one page milestone and summary schedule, sorted by total Float, early-start, early-finish;
- b. Detailed Project Schedule: organized by Work Breakdown Structure (WBS) or area of work; sorted by total Float, early-start, early-finish;
- c. Critical Path Schedule: sorted based on the total Float, early-start, early-finish;
- d. 60-Day Look Ahead Schedule: sorted by total Float, early-start, early-finish;
- e. Activities in Progress: organized by WBS or area of work; sorted by total Float, early-start, early-finish;
- f. Cash Flow Trending Report: presented in an S-Curve format based on original planned early start and late start forecasted expenditures. In addition, the historical actual data point(s) are to be graphed within the S-Curve graphic report;
- g. Monthly payment projections;
- h. Out-of-sequence Report: tabular report showing work performed out-of-sequence.

Contractor shall submit additional layouts if directed by Engineer.

The submittal shall include the following:

- a. Narrative report summarizing the milestones, critical path, project approach including phasing or use of crews, significant submittal and fabrication items, coordination or interface requirements, Owner-provided items, and list of subcontractors and vendors.
- b. Graphic reports including critical path report (longest path), summary schedule report, total Float report by early-start early-finish, look-ahead report grouped by work breakdown structure or project phasing, and cash flow projection. Cash flow projections include estimated cumulative cost curves based on early and late start dates and projection of monthly payments over the life of the project

The schedule, critical path, and look-ahead schedules shall be submitted on 22"x34" size paper;

The Progress Schedule file shall be submitted in an executable format, using Primavera Project Manager (P6) format on a read-write compact disk.

The narrative and graphic reports shall be provided on 8"x11" paper and E-size plots respectively.

Contractor shall submit 4 copies of each deliverable.

10. MONTHLY SCHEDULE UPDATES. Monthly Progress Schedule updates shall be submitted for the duration of the Contract on a date agreed to by Owner, Engineer, and Contractor. If monthly Progress Schedule updates are not submitted by the due date, progress payments will be withheld until the required information is submitted.

The updated schedule shall be reviewed each month in a meeting with Engineer to verify:

- a. Actual start dates,
- b. Actual completion dates,
- c. Activity percent completion,
- d. Revised logic (as-built and projected) and changes in activity durations, cost assigned,
- e. Cost influence of change orders, if any,
- f. Revisions due to extension of time.

Prior to each meeting, Contractor shall prepare a complete and accurate report of current procurement and construction progress through the end of the update period, and a depiction of how Contractor plans to continue the Work to meet all contract completion dates. All network changes and status data agreed to during each update meeting shall be considered as accepted by both parties unless written notice of any exceptions is given within five calendar days after the meeting.

For major network changes that cannot be agreed to during an updating meeting, Contractor shall submit the proposed changes for Engineer's acceptance prior to inserting such changes into the network. Submittals may be in the form of marked-up networks, fragnets, or schedule abstracts, provided they are submitted with a letter of transmittal. A fragnet is defined as a sequence of new activities and/or activity revisions that are proposed to be added to the existing schedule to demonstrate how project events have an impact on the schedule.

11. DATA DATE. The data date is the re-settable date in P6 that serves as the end of a reporting period. The reporting period will be recorded on a monthly basis, e.g., January 1st through January 31st with the 31st as the data date. If required for coordination purposes by Owner, Engineer will provide specific data dates to be used by Contractor.

12. REVIEW PROCESS. Engineer will review Contractor's preliminary Progress Schedule and full Progress Schedule submittals within 15 calendar days after receipt of all required information.

At the request of Owner or Engineer, Contractor shall participate in any meetings necessary to reach a mutual agreement and acceptance of the preliminary Progress Schedule, Progress Schedules, or Cash Flow Projections.

If any of the required submittals are returned to Contractor for corrections or revisions, they shall be resubmitted within ten calendar days after the return mailing date. Resubmittals shall include all information and media included in the first submittal. Review and response by Engineer will be given within 10 calendar days after receipt of each resubmittal.

Schedules shall show contract completion of the Work on the Contract completion date and with zero or positive total Float even if Contractor plans to finish early. In no event shall acceptance of the Progress Schedule be a basis for a claim for delay against Owner or Engineer by Contractor for an early finish. A Progress Schedule containing activities with negative Float or that extend beyond the date that the Work is completed and ready for final payment will not be acceptable.

Acceptance of the Progress Schedule by Engineer does not relieve Contractor of responsibility for accomplishing the Work by the Contract completion date.

Omissions and errors in the accepted Progress Schedule shall not relieve Contractor of obligations under the Contract. Acceptance by Engineer in no way makes Engineer or Owner an insurer of the Progress Schedule's success or liable for time or cost overruns. Engineer and Owner hereby disclaim any obligation or liability by reason of acceptance of the Progress Schedule by Engineer.

13. RESPONSIBILITY FOR SCHEDULE COMPLIANCE. Whenever it becomes apparent from the current Progress Schedule that the critical path is delayed and the contract completion date will not be met, Contractor shall mitigate the delay by taking some or all of the following actions at no additional cost to Owner.

- a. Increase construction manpower in such quantities and crafts as will bring the project back on schedule within the completion dates and milestones.
- b. Increase the number of working hours per shift, shifts per day, working days per week, and the amount of construction equipment, or any combination of the foregoing, to substantially eliminate the backlog of work.
- c. Re-schedule activities to achieve maximum practical concurrence of activities and to comply with the schedule date(s).

Within ten calendar days of Engineer's request, Contractor shall submit a recovery schedule and written statement of the steps intended to remove or arrest the delay to the critical path in the schedule. If Contractor fails to submit the required information or should fail to take measures acceptable to Engineer, Engineer with Owner concurrence may direct Contractor to increase man-power, equipment and scheduled work hours to remove or arrest the delay to the critical path and Contractor shall promptly provide such level of effort at no additional cost to Owner.

In the event Contractor fails to follow the updated or revised recovery schedule, Owner may elect to withhold progress payments until Contractor complies with the revised schedule.

Should Contractor's efforts not remove or arrest the delay to the critical path of the accepted schedule, then Owner shall be entitled to supplement Contractor's work-force and equipment to remove and arrest any delay, and shall be entitled to deduct all costs and expenses associated therewith from payments due to Contractor. If insufficient Contract funds remain, Owner may recover such funds from Contractor and its Surety.

14. CHANGES IN THE WORK, DELAYS, AND EXTENSIONS OF TIME. When changes in the Work or delays are experienced by Contractor and Contractor requests an extension of time, Contractor shall submit a written time impact analysis to Engineer illustrating the influence of each change or delay to the current Contract Times. Each time impact analysis shall include a fragnet incorporating the change or delay into the Progress Schedule to demonstrate how Contractor was delayed.

Each time impact analysis shall demonstrate the estimated time impact based on the events of the change or the delay; the date the change was given to Contractor or the delay incurred, the status of construction at that point in time, and the event time computation of all activities affected by the change or delay. The event times used in the analysis shall be those included in the latest update of the Progress Schedule or as adjusted for the events of delay.

Three copies of the time impact analysis and an electronic copy on compact disk shall be submitted within seven calendar days of delay occurrence or direction to proceed with a change is given to Contractor. No time extensions will be considered if the time impact analysis is not submitted within the specified time.

Engineer will review Contractor's time impact analysis. Contractor shall furnish such justification and supporting evidence as Engineer deems necessary to determine whether Contractor is entitled to an extension of time. Engineer's review of each time impact analysis will be made within five working days of receipt of the time impact analysis and additional information as required by Engineer, unless subsequent meetings and negotiations are necessary.

The Contract Times will be adjusted only for causes specified in paragraph 15. Time extensions will be granted only to the extent that equitable time adjustments for the activity or activities affected exceed the total or remaining Float along the critical path at the time of actual delay. Delays in activities which are not on the critical path and do not affect Contract Times, will not be considered for an extension of time.

15. CAUSES FOR EXTENSIONS OF TIME. Additional positive total Float in the Progress Schedule generated by efficiencies of Owner or Contractor is a shared commodity to be reasonably used by either party, and belongs exclusively to the Project. Contractor is not entitled to any additional compensation for completion of the project prior to expiration of the Contract Times.

15.01. Owner-Initiated Changes. Owner initiated changes to the Work that absorb Float time will not be considered for an extension of time. Owner-initiated changes that affect the critical path of the Progress Schedule shall be grounds for extending or shortening completion dates. Use of Float time for Contractor initiated changes will require Owner's concurrence. Contractor's changes,





16. AS-BUILT SCHEDULE. As a condition precedent to release of final payment, the last update to the Progress Schedule submitted shall be identified by Contractor as the "As-Built Schedule". The "As-Built Schedule" shall reflect the exact manner in which the project was actually constructed (including actual start and completion dates, activities, sequences, and logic) and shall be signed and certified by Contractor's project manager.

17. SCHEDULING SOFTWARE APPLICATION. Scheduling software shall be Primavera Project Manager (P6) without exception.

18. SCHEDULE SOFTWARE SETTINGS AND RESTRICTIONS: Contractor shall consult with Engineer for acceptable Primavera Project Manager software settings and restrictions. The following shall apply unless otherwise directed by Engineer.

- a. Schedule Options:
  - i. Shall be defined only to "Use expected finish dates";
  - ii. Scheduling progressed activities to be set to "Use only retained logic", not progress override option;
  - iii. Critical Path activities defined as total Float less than or equal to zero;
  - iv. Calculating start-to-start lag from "early start" dates; and computing total Float as "finish Float = late finish – early finish";
  - v. Calendar to be set for scheduling relationship lag as "Predecessor Activity Calendar."
- b. Activity progress shall be shown using Remaining Duration. Date format shall be DDMMYY.
- c. Default activity type shall be set to "Independent Task".
- d. Date/time activity constraint(s), other than those required by the Contract, will not be allowed unless accepted by Engineer. Contractor shall identify proposed constraints and explain the constraint purpose in the Narrative Report.
- e. Lags shall not be used in the creation of an activity that will perform the same function, e.g., concrete cure time. Lag durations contained in the Progress Schedule shall not have a negative

value. Contractor shall identify any lag proposed and explain the purpose of the lag in the Narrative Report.

- f. Actual Start and Finish dates shall not be automatically updated by default mechanism that may be included in the CPM scheduling software system. Actual Start and Actual Finish dates on the CPM schedule shall be updated by actual work progression.

19. ACTIVITY CODES. The Primavera (P6) activity codes and work breakdown structure (WBS) to be confirmed or revised by Engineer are listed below. Confirmation or revision of the activity codes and WBS will be provided to Contractor within three workdays of the Effective Date of the Contract. Use of Engineer prescribed activity codes and WBS is mandatory.

“Project Codes” as defined by Primavera P6 is reserved for Owner. Only “Activity Codes” at Project Level will be permitted for Contractor use.

<u>Activity Code</u>	<u>Code Value</u>	<u>Description</u>
Phase	0005	Construction Phase
Construction Phase	A	Milestones
	BC	Administrative
	D	Submittals
	E	Construction Activities
		Closeout Phase
Submittals	SUB	Submittals
	R&A	Review & Approve
	F&D	Fabricate & Deliver

*Other Codes to be prescribed by Engineer or requested by Contractor for project specific criteria.*

20. ACTIVITY RELATIONSHIPS. Relationships between activities shall be identified with the following information:

- a. Predecessor and successor activity ID.
- b. Relationship types:
  - i. FS - Finish to start

- ii. SS - Start to start
- iii. FF - Finish to finish
- iv. SF - Start to finish – This relationship is not allowed, unless authorized by Engineer.

21. PROJECT CALENDARS. Project Calendars shall use workdays and calendar days as the planning unit for the schedule. Use of Global Calendars is reserved for Owner. Each calendar shall be set to start on Mondays with holidays in accordance with Owner policy. The following calendars shall be used for each activity except as otherwise accepted by Engineer:

- a. 5-Day x 8 Hour Workweek (with holidays) shall be used for 5-day 40-hour workweek activities: Monday through Friday. All holidays and non-work days shall be assigned to this calendar. This calendar shall be used for all normal work activities, submittals, and fabricate and delivery activities. This calendar shall be the default calendar for the project unless otherwise specified.
- b. 5-Day x 10-Hour Workweek (with holidays) shall be used for 5-day 50-hour workweek activities: Monday through Friday. All holidays and non-work days shall be assigned to this calendar.
- c. 6-Day x 10-Hour Workweek (with holidays) shall be used for 6-day 60-hour workweek activities. Monday through Saturday. All holiday and non-work days shall be assigned to this calendar.
- d. 7-Day Calendar (no holidays) shall be used for 7-day workweek activities. No non-work days shall be entered into this calendar.
- e. Additional Calendars may be assigned depending on need. However, Contractor shall consult with Engineer before other calendars are entered and/or used in the Progress Schedule.

The work day to calendar day correlation shall be based on a single shift and 5-day work week with adequate allowance for holidays, adverse weather and all other special requirements of the Work. Contractor may, at his option, propose alternate baseline calendars to allow a second shift and/or a single shift on Saturdays subject to the concurrence and acceptance of Owner. Under no circumstances will a schedule be accepted which allows regularly scheduled work on Sundays.

The holidays observed by Owner are as follows:

New Year's Day  
Memorial Day  
July 4<sup>th</sup>  
Labor Day  
Thanksgiving Day and the following Friday  
Christmas Day

22. FLOAT. Contractor shall not use Float suppression techniques, including preferential sequencing (arranging critical path through activities more susceptible to Owner caused delay); lag logic restraints; zero total or free Float constraints; extended activity times; or imposing constraint dates other than as required by the Contract. Float suppression will be cause for rejection of the preliminary Progress Schedule or full Progress Schedule and its updates.

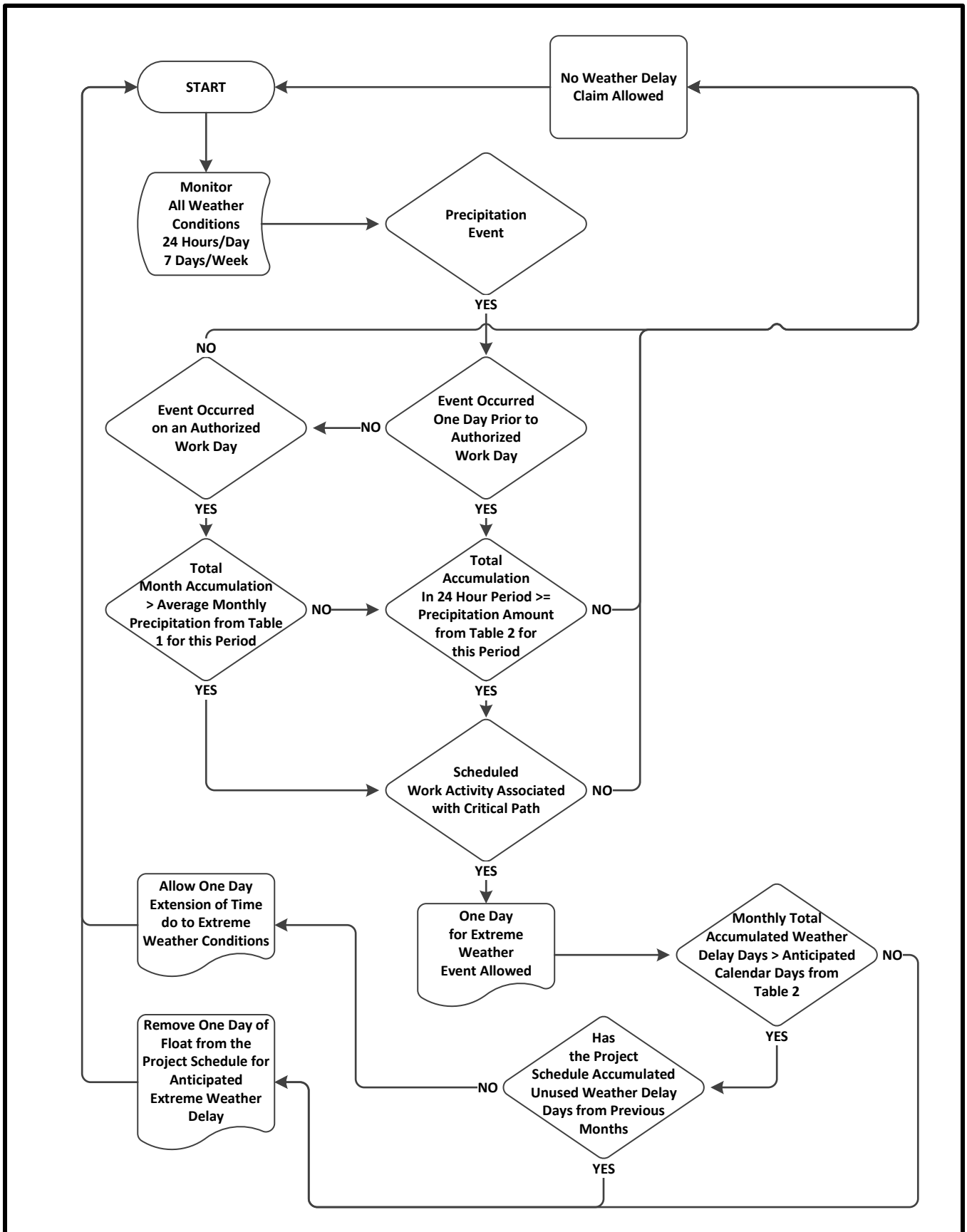
23. MANDATORY MILESTONES. The Contract duration shall be equal to the time period between the Notice to Proceed and the completion of the Work in readiness for final payment. The following milestones are mandatory.

- a. Project Award
- b. Notice to Proceed
- c. Milestones, if any, as indicated in Contractor's Bid
- d. Substantial Completion as indicated in Contractor's Bid
- e. Completion and readiness for final payment, as indicated in Contractor's Bid

The following additional milestones are to be considered and incorporated into the Progress Schedule in accordance with the Contract, if applicable.

- a. Permit constraints
- b. Facility shut down or outage milestone requirements
- c. Applicable phasing milestones
- d. Other milestones deemed appropriate by Engineer

End of Section



**EXTREME WEATHER EVENT DELAY CLAIM  
DECISION MAKING FLOW CHART**





Section 01320

CONSTRUCTION PROGRESS DOCUMENTATION

1. GENERAL.

1.01. Units of Measurement. When both inch-pound (English) and SI (metric) units of measurement are specified herein, the values expressed in inch-pound units shall govern.

2. SCHEDULE OF PAYMENTS. Within 30 days after award of contract, Contractor shall furnish to Engineer a schedule of estimated monthly payments. The schedule shall be revised and resubmitted each time an Application for Payment varies more than 10 percent from the estimated payment schedule.

3. SURVEY DATA. All field books, notes, and other data developed by Contractor in performing surveys required as part of the Work shall be available to Engineer for examination throughout the construction period. All such data shall be submitted to Engineer with the other documentation required for final acceptance of the Work.

4. LAYOUT DATA. Contractor shall keep neat and legible notes of measurements and calculations made in connection with the layout of the Work. Copies of such data shall be furnished to the Resident Project Representative for use in checking Contractor's layout as provided in the project requirements section. All such data considered of value to Owner will be transmitted to Owner by Engineer with other records upon completion of the Work.

End of Section





Section 01380

PHOTOGRAPHIC DOCUMENTATION

1. CONSTRUCTION PHOTOGRAPHS BY CONTRACTOR. Contractor shall be responsible for the production of construction photographs as provided herein. Engineer shall designate the subject of each photograph.

For pipeline projects, photographs shall be taken along the route of the pipeline before the commencement of Work, and promptly submitted to Engineer. The photographs shall be at intervals of 50 feet. The same views shall be rephotographed upon completion of construction activities on any section of the pipeline, and submitted with Contractor's Application for Payment for Work on that section.

All photographs shall be color digital, produced by a competent professional photographer. Contractor shall submit the photographs electronically and two copies of 4 by 5 inch prints. Digital images shall be compiled on CD and provided with a descriptive index of the images. Prints shall be mounted on linen with flap for binding or enclosed in clear plastic binders, and marked with the name and number of the Contract, name of Contractor, description and location of view, and date photographed.

Engineer will transmit the digital files and one copy of the prints to Owner.

End of Section



Section 01400

QUALITY CONTROL

1. TESTING SERVICES. Testing services shall be provided in accordance with Paragraph 13.03 of the General Conditions. All tests to determine compliance with the Contract Documents shall be performed by an independent commercial testing firm acceptable to Engineer excluding testing as specified to be conducted directly by Contractor. The testing firm's laboratory shall be staffed with experienced technicians, properly equipped and fully qualified to perform the tests in accordance with the specified standards.

Testing services provided by Owner are for the sole benefit of Owner and/or as required by the governing building code; however, test results shall be available to Contractor. Testing necessary to satisfy Contractor's internal quality control procedures shall be the sole responsibility of Contractor.

1.01. Testing Services Provided by Contractor. Unless otherwise specified, Contractor shall provide all testing services in connection with the following:

Any Work or part thereof specifically to be inspected, tested or approved by an employee or representative of an Authority Having Jurisdiction. Contractor shall assume full responsibility for arranging and obtaining such inspections, tests or approvals. Contractor shall pay all costs associated for these activities and shall provide the required certificates of inspection or approval.

Any inspections, tests or approvals required for Owner or Engineer acceptance of materials or equipment to be incorporated in the Work. This includes any items required for acceptance of materials, concrete mix designs or equipment submitted for approval prior to Contractor's purchase for incorporation in the Work.

Testing, adjusting and balancing of mechanical, electrical and other equipment and systems as specified to be incorporated into the Work. This includes services required by manufacturers of equipment or other products such as concrete repair products, pipe, coatings, linings and roof membranes furnished under the Contract Documents.

Tightness testing of containment structures and pressure or leakage testing of piping as specified.

Any Work (or part thereof) required by the Contract Documents to be approved by Owner, Engineer or other designated individual or entity. Contractor shall assume full responsibility for arranging and obtaining such approvals, pay all costs in connection therewith and submit to

Engineer the required certificates of approval.

Excluding those conducted directly by an Authority Having Jurisdiction or expressly specified to be conducted directly by Contractor, inspections and tests shall be performed by independent inspectors, approved agencies or other qualified individuals or entities acceptable to Owner and Engineer.

Contractor shall also employ and pay for the services of an independent testing laboratory, approved agency or other qualified individual or entities for inspections, tests or approvals required by the Contract Documents for field quality control. These include items indicated as Contractor provided in the following:

02202 Trenching and Backfilling

02512 Asphalt Paving

02675 Cleaning and Disinfection of Water Pipelines

03340 Low Density Cellular Concrete

1.02. Testing Services and Special Inspections Provided by Owner.

Contractor shall provide access to the site and Work in accordance with Paragraphs 13.02 and 13.03 of the General Conditions. Contractor shall give timely notice of the readiness of the Work for inspection, tests or approvals and shall cooperate with the inspection and testing personnel to facilitate the required tests and inspections. Contractor shall furnish all sample materials and cooperate in the testing activities, including sampling. Contractor shall interrupt the Work when necessary to allow testing, including sampling, to be performed. Contractor shall have no Claim for an increase in Contract Price or Contract Times due to such interruption. When testing activities, including sampling, are performed in the field by Engineer or Agency personnel, Contractor shall furnish personnel and facilities to assist in the activities as required.

1.03. Transmittal of Test Reports. Written reports of tests and engineering data furnished by Contractor for Engineer's review of materials and equipment proposed to be used in the Work shall be submitted as specified for Shop Drawings.

The Approved Agency retained by Contractor will furnish five copies of a written report of each test. Two copies of each test report will be transmitted to the Resident Project Representative, one copy to the Owner, one copy to Engineer, and one copy to Contractor, within 3 days after each test is completed.

End of Section

Section 01500

TEMPORARY FACILITIES AND CONTROLS

1. OFFICE AT SITE OF WORK. During the performance of this Contract, Contractor shall maintain a suitable office at or near the Site which shall be the headquarters of its representative authorized to receive drawings, instructions, or other communication or articles. Any communication given to the said representative or delivered at Contractor's office at the Site in the representative's absence shall be deemed to have been delivered to Contractor.

Copies of the Drawings, Specifications, and other Contract Documents shall be kept at Contractor's office at the Site and available for use at all times.

Locate the offices and other Contractor facilities to limit site disturbance as specified in the Project Requirements section.

2. WATER. All water required for and in connection with the Work to be performed shall be furnished by and at the expense of Contractor through meters installed on hydrants. Contractor shall supply all necessary tools, hose, and pipe, or otherwise transport the water to the point of use, and shall make its own arrangements with the County or City Water Department as to the amount of water required and the time when the water will be needed. Union County or City of Monroe water use requests shall be made two weeks in advance and are subject to approval. Indiscriminate use of water so furnished will not be permitted. Special hydrant wrenches shall be used for opening and closing fire hydrants. In no case shall pipe wrenches be used for this purpose.

3. POWER. Contractor shall provide all power for heating, lighting, operation of Contractor's plant or equipment, or for any other use by Contractor. Temporary heat and lighting shall be maintained until the Work is accepted.

4. VOICE AND DATA SERVICES. Contractor shall make all necessary arrangements and pay all installation charges for voice and data lines in its offices at the Site and shall provide all telephone instruments.

5. SANITARY FACILITIES. Contractor shall furnish temporary sanitary facilities at the Site, as provided herein, for the needs of all construction workers and others performing work or furnishing services on the Project.

Sanitary facilities shall be of reasonable capacity, properly maintained throughout the construction period, and obscured from public view to the greatest practical extent. If toilets of the chemically treated type are used, at least one toilet will be

furnished for each 20 persons. Contractor shall enforce the use of such sanitary facilities by all personnel at the Site.

6. MAINTENANCE OF TRAFFIC. Contractor shall conduct its work to interfere as little as possible with public travel, whether vehicular or pedestrian. Whenever it is necessary to cross, obstruct, or close roads, driveways, and walks, whether public or private, Contractor shall provide and maintain suitable and safe bridges, detours, or other temporary expedients for the accommodation of public and private travel, and shall give reasonable notice to owners of private drives before interfering with them. Such maintenance of traffic will not be required when Contractor has obtained permission from the owner and tenant of private property, or from the authority having jurisdiction over public property involved, to obstruct traffic at the designated point.

In making open-cut street crossings, Contractor shall not block more than one-half of the street at a time. Whenever possible, Contractor shall widen the shoulder on the opposite side to facilitate traffic flow. Temporary surfacing shall be provided as necessary on shoulders.

6.01. Temporary Bridges. Contractor shall construct substantial bridges at all points where it is necessary to maintain traffic across pipeline construction. Bridges in public streets, roads, and highways shall be acceptable to the authority having jurisdiction. Bridges erected in private roads and driveways shall be adequate for the service to which they will be subjected. Bridges shall be provided with substantial guardrails and with suitably protected approaches. Foot bridges shall be at least 4 feet wide, provided with handrails and uprights of dressed lumber. Bridges shall be maintained in place as long as the conditions of the Work require their use for safety of the public. When necessary for the proper prosecution of the Work in the immediate vicinity of a bridge, the bridge may be relocated or temporarily removed for such period as Engineer may permit.

6.02. Detours. Where required by the authority having jurisdiction that traffic be maintained over any construction work in a public street, road, or highway, and the traffic cannot be maintained on the alignment of the original roadbed or pavement, Contractor shall, at its own expense, construct and maintain a detour around the construction work. Each detour shall include a bridge across the pipe trench and all necessary barricades, guardrails, approaches, lights, signals, signs, and other devices and precautions necessary for protection of the Work and safety of the public. Contractor shall prepare traffic control plan and detour plan as required by the Authority Having Jurisdiction and provide a copy to Engineer.

7. BARRICADES AND LIGHTS. All streets, roads, highways, and other public thoroughfares which are closed to traffic shall be protected by effective barricades on which shall be placed acceptable warning signs. Barricades shall

be located at the nearest intersecting public highway or street on each side of the blocked section.

All open trenches and other excavations shall have suitable barricades, signs, and lights to provide adequate protection to the public. Obstructions, such as material piles and equipment, shall be provided with similar warning signs and lights.

All barricades and obstructions shall be illuminated with warning lights from sunset to sunrise. Material storage and conduct of the Work on or alongside public streets and highways shall cause the minimum obstruction and inconvenience to the traveling public.

All barricades, signs, lights, and other protective devices shall be installed and maintained in conformity with applicable statutory requirements and, where within railroad and highway rights-of-way, as required by the authority having jurisdiction.

8. FENCES. All existing fences affected by the Work shall be maintained by Contractor until completion of the Work. Fences which interfere with construction operations shall not be relocated or dismantled until written permission is obtained from the owner of the fence, and the period the fence may be left relocated or dismantled has been agreed upon. Where fences must be maintained across the construction easement, adequate gates shall be installed. Gates shall be kept closed and locked at all times when not in use.

On completion of the Work across any tract of land, Contractor shall restore all fences to their original or to a better condition and to their original locations.

9. PROTECTION OF PUBLIC AND PRIVATE PROPERTY. Contractor shall protect, shore, brace, support, and maintain all underground pipes, conduits, drains, and other underground construction uncovered or otherwise affected by its construction operations. All pavement, surfacing, driveways, curbs, walks, buildings, utility poles, guy wires, fences, and other surface structures affected by construction operations, together with all sod and shrubs in yards, parkways, and medians, shall be restored to their original condition, whether within or outside the easement. All replacements shall be made with new materials.

No trees shall be removed outside the permanent easement, except where authorized by Engineer. Whenever practicable, Contractor shall tunnel beneath trees in yards and parkings when on or near the line of trench. Hand excavation shall be employed as necessary to prevent injury to trees. Trees left standing shall be adequately protected against damage from construction operations.

Contractor shall be responsible for all damage to streets, roads, highways, shoulders, ditches, embankments, culverts, bridges, and other public or private property, regardless of location or character, which may be caused by transporting equipment, materials, or workers to or from the Work or any part or site thereof, whether by Contractor or its Subcontractors. Contractor shall make satisfactory and acceptable arrangements with the owner of, or the agency or authority having jurisdiction over, the damaged property concerning its repair or replacement or payment of costs incurred in connection with the damage.

All fire hydrants and water control valves shall be kept free from obstruction and available for use at all times.

10. DAMAGE TO EXISTING PROPERTY. Contractor will be held responsible for any damage to existing structures, Work, materials, or equipment because of his operations and shall repair or replace any damaged structures, Work, materials, or equipment to the satisfaction of, and at no additional cost to, Owner.

Contractor shall protect all existing structures and property from damage and shall provide bracing, shoring, or other work necessary for such protection.

Contractor shall be responsible for all damage to streets, roads, curbs, sidewalks, highways, shoulders, ditches, embankments, culverts, bridges, or other public or private property, which may be caused by transporting equipment, materials, or workers to or from the Work. Contractor shall make satisfactory and acceptable arrangements with the agency having jurisdiction over the damaged property concerning its repair or replacement.

11. TREE AND PLANT PROTECTION. All trees and other vegetation which must be removed to perform the Work which will not be relocated shall be removed and disposed of by Contractor; however, no trees or cultured plants shall be unnecessarily removed unless their removal is indicated on the Drawings. All trees and plants not removed shall be protected against injury from construction operations.

Contractor shall take extra measures to protect trees designated to be preserved, such as erecting barricades, trimming to prevent damage from construction equipment, and installing pipe and other Work by means of hand excavation or tunneling methods. Such trees shall not be endangered by stockpiling excavated material or storing equipment against their trunks.

When injuring or removal of trees designated to be preserved cannot be avoided, or when removal and replacement is indicated on the Drawings, each tree injured beyond repair or removed shall be replaced with a similar tree of the nearest size possible.



All trimming, repair, and replacement of trees and plants shall be performed by qualified nurserymen or horticulturists.

12. SECURITY. Contractor shall be responsible for protection of the Site, and all Work, materials, equipment, and existing facilities thereon, against vandals and other unauthorized persons.

No Claim shall be made against Owner by reason of any act of an employee or trespasser, and Contractor shall make good all damage to Owner's property resulting from Contractor's failure to provide security measures as specified.

Security measures shall be at least equal to those usually provided by Owner to protect Owner's existing facilities during normal operation, but shall also include such additional security fencing, barricades, lighting, and other measures as required to protect the Site.

13. ACCESS ROADS. Contractor shall establish and maintain temporary access roads to various parts of the Site as required to complete the Project. Such roads shall be available for the use of all others performing work or furnishing services in connection with the Project.

14. PARKING. Contractor shall provide and maintain suitable parking areas for the use of all workers and others performing work or furnishing services in connection with the Project, as required to avoid any need for parking personal vehicles where they may interfere with public traffic, Owner's operations, or construction activities.

15. NOISE CONTROL. Contractor shall take reasonable measures to avoid unnecessary noise. Such measures shall be appropriate for the normal ambient sound levels in the area during working hours. All construction machinery and vehicles shall be equipped with practical sound-muffling devices, and operated in a manner to cause the least noise consistent with efficient performance of the Work.

During construction activities on or adjacent to occupied buildings, and when appropriate, Contractor shall erect screens or barriers effective in reducing noise in the building and shall conduct its operations to avoid unnecessary noise which might interfere with the activities of building occupants.

16. DUST CONTROL. Contractor shall take reasonable measures to prevent unnecessary dust. Earth surfaces subject to dusting shall be kept moist with water or by application of a chemical dust suppressant. When practicable, dusty materials in piles or in transit shall be covered to prevent blowing dust.

Buildings or operating facilities which may be affected adversely by dust shall be adequately protected from dust. Existing or new machinery, motors, instrument panels, or similar equipment shall be protected by suitable dust screens. Proper ventilation shall be included with dust screens.

17. TEMPORARY DRAINAGE PROVISIONS. Contractor shall provide for the drainage of storm water and such water as may be applied or discharged on the Site in performance of the Work. Drainage facilities shall be adequate to prevent damage to the Work, the Site, and adjacent property.

Existing drainage channels and conduits shall be cleaned, enlarged, or supplemented as necessary to carry all increased runoff attributable to Contractor's operations. Dikes shall be constructed as necessary to divert increased runoff from entering adjacent property (except in natural channels), to protect Owner's facilities and the Work, and to direct water to drainage channels or conduits. Ponding shall be provided as necessary to prevent downstream flooding.

18. EROSION CONTROL. Contractor shall prevent erosion of soil on the Site and adjacent property resulting from its construction activities. Effective measures shall be initiated prior to the commencement of clearing, grading, excavation, or other operation that will disturb the natural protection.

Work shall be scheduled to expose areas subject to erosion for the shortest possible time, and natural vegetation shall be preserved to the greatest extent practicable. Temporary storage and construction buildings shall be located, and construction traffic routed, to minimize erosion. Temporary fast-growing vegetation or other suitable ground cover shall be provided as necessary to control runoff.

19. POLLUTION CONTROL. Contractor shall prevent the pollution of drains and watercourses by sanitary wastes, sediment, debris, and other substances resulting from construction activities. No sanitary wastes shall be permitted to enter any drain or watercourse other than sanitary sewers. No sediment, debris, or other substance shall be permitted to enter sanitary sewers, and reasonable measures shall be taken to prevent such materials from entering any drain or watercourse.

20. PROJECT IDENTIFICATION AND CONSTRUCTION SIGNS. Contractor shall provide six project identification signs as specified below. The signs shall be erected along the construction work in locations designated by the Owner. At completion of the work, the signs shall be removed by the Contractor.

In addition, Contractor and its Subcontractors shall provide business signs on their field offices, storage facilities, and temporary buildings.

Contractor shall provide informational signs as required by applicable laws, ordinances, standards, and codes to help maintain the safety and health at the work site, such as “Danger”, “High Voltage”, etc.

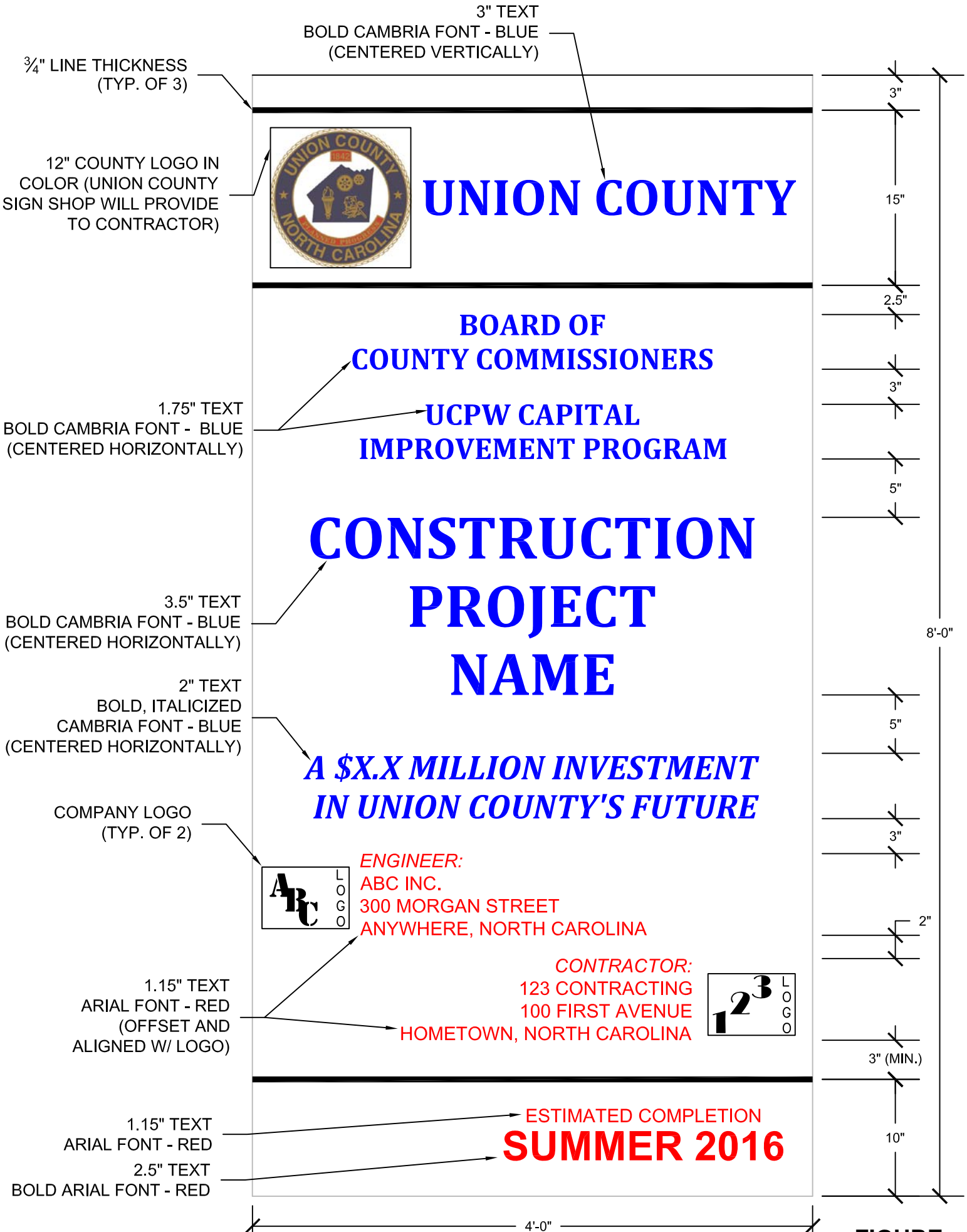
Any additional signs requested by Contractor must be approved by the Owner.

20.01. Project Identification Sign. Three project Identification signs shall be provided at locations directed by the Owner and as indicated herein. The sign shall be 4 feet wide by 8 feet high and shall contain the text indicated on the attached Figure 1-01500.

The sign supports shall be fabricated from pressure treated structural lumber. The sign face shall be fabricated from overlaid plywood, exterior grade. All surfaces of the sign shall be given a suitable primer coat and two finish coats of wood-protective paint. The final coat shall be of the color indicated for sign background color. The Contractor shall provide all requirements for lettering the sign in the format indicated in Figure 1-01500.

End of Section





3" TEXT  
 BOLD CAMBRIA FONT - BLUE  
 (CENTERED VERTICALLY)

3/4" LINE THICKNESS  
 (TYP. OF 3)

12" COUNTY LOGO IN COLOR  
 (UNION COUNTY SIGN SHOP WILL PROVIDE TO CONTRACTOR)



**UNION COUNTY**

**BOARD OF  
 COUNTY COMMISSIONERS**

1.75" TEXT  
 BOLD CAMBRIA FONT - BLUE  
 (CENTERED HORIZONTALLY)

**UCPW CAPITAL  
 IMPROVEMENT PROGRAM**

**CONSTRUCTION  
 PROJECT  
 NAME**

3.5" TEXT  
 BOLD CAMBRIA FONT - BLUE  
 (CENTERED HORIZONTALLY)

2" TEXT  
 BOLD, ITALICIZED  
 CAMBRIA FONT - BLUE  
 (CENTERED HORIZONTALLY)

***A \$X.X MILLION INVESTMENT  
 IN UNION COUNTY'S FUTURE***

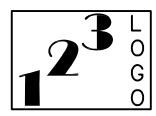
COMPANY LOGO  
 (TYP. OF 2)



**ENGINEER:**  
**ABC INC.**  
**300 MORGAN STREET**  
**ANYWHERE, NORTH CAROLINA**

1.15" TEXT  
 ARIAL FONT - RED  
 (OFFSET AND  
 ALIGNED W/ LOGO)

**CONTRACTOR:**  
**123 CONTRACTING**  
**100 FIRST AVENUE**  
**HOMETOWN, NORTH CAROLINA**



1.15" TEXT  
 ARIAL FONT - RED  
 2.5" TEXT  
 BOLD ARIAL FONT - RED

**ESTIMATED COMPLETION  
 SUMMER 2016**

**STANDARD CONSTRUCTION PROJECT SIGN** **FIGURE 1-01500**



## Section 01610

### GENERAL EQUIPMENT STIPULATIONS

1. SCOPE. When an equipment specification section in this Contract references this section, the equipment shall conform to the general stipulations set forth in this section, except as otherwise specified in other sections.

2. COORDINATION. Contractor shall coordinate all details of the equipment with other related parts of the Work, including verification that all structures, piping, wiring, and equipment components are compatible. Contractor shall be responsible for all structural and other alterations in the Work required to accommodate equipment differing in dimensions or other characteristics from that contemplated in the Drawings or Specifications.

3. MANUFACTURER'S EXPERIENCE. Unless specifically named in the Specifications, a manufacturer shall have furnished equipment of the type and size specified which has been in successful operation for not less than the past 5 years.

4. WORKMANSHIP AND MATERIALS. Contractor shall guarantee all equipment against faulty or inadequate design, improper assembly or erection, defective workmanship or materials, and leakage, breakage, or other failure. Materials shall be suitable for service conditions.

All equipment shall be designed, fabricated, and assembled in accordance with recognized and acceptable engineering and shop practice. Individual parts shall be manufactured to standard sizes and thicknesses so that repair parts, furnished at any time, can be installed in the field. Like parts of duplicate units shall be interchangeable. Equipment shall not have been in service at any time prior to delivery, except as required by tests.

Except where otherwise specified, structural and miscellaneous fabricated steel used in equipment shall conform to AISC standards. All structural members shall be designed for shock or vibratory loads. Unless otherwise specified, all steel which will be submerged, all or in part, during normal operation of the equipment shall be at least 1/4 inch thick. When dissimilar metal components are used, consideration shall be given to prevention of galvanic corrosion.

5. STRUCTURAL DESIGN REQUIREMENTS. Not used.

6. LUBRICATION. Equipment shall be adequately lubricated by systems which require attention no more frequently than weekly during continuous operation.

Lubrication systems shall not require attention during startup or shutdown and shall not waste lubricants.

Lubricants of the types recommended by the equipment manufacturer shall be provided in sufficient quantities to fill all lubricant reservoirs and to replace all consumption during testing, startup, and operation prior to acceptance of equipment by Owner. Lubricants for equipment where the lubricants may come in contact with water before or during a potable water treatment process or with potable water, shall be food grade lubricants. This includes lubricants for equipment not normally in contact with water, but where accidental leakage of the lubricants may contaminate the water.

Lubrication facilities shall be convenient and accessible. Oil drains and fill openings shall be easily accessible from the normal operating area or platform. Drains shall allow for convenient collection of waste oil in containers from the normal operating area or platform without removing the unit from its normal installed position.

7. ELEVATION. The elevation of the site shall be as indicated on the Drawings.

8. ELECTRIC MOTORS. Not used.

9. DRIVE UNITS. Not used.

10. SAFETY GUARDS. Not used.

11. ANCHOR BOLTS. Not used.

12. EQUIPMENT BASES. Not used.

13. SPECIAL TOOLS AND ACCESSORIES. Equipment requiring periodic repair and adjustment shall be furnished complete with all special tools, instruments, and accessories required for proper maintenance. Equipment requiring special devices for lifting or handling shall be furnished complete with those devices.

14. SHOP PAINTING. All iron and steel surfaces of the equipment shall be protected with suitable protective coatings applied in the shop. Surfaces of the equipment that will be inaccessible after assembly shall be protected for the life of the equipment. Coatings shall be suitable for the environment where the equipment is installed. Exposed surfaces shall be finished, thoroughly cleaned, and filled as necessary to provide a smooth, uniform base for painting. Electric motors, speed reducers, starters, and other self-contained or enclosed components shall be shop primed or finished with an epoxy or polyurethane



enamel or universal type primer suitable for top coating in the field with a universal primer and aliphatic polyurethane system.

Surfaces to be coated after installation shall be prepared for painting as recommended by the paint manufacturer for the intended service, and then shop painted with one or more coats of a universal primer.

Machined, polished, and nonferrous surfaces which are not to be painted shall be coated with rust-preventive compound as recommended by the equipment manufacturer.

15. PREPARATION FOR SHIPMENT. Equipment shall be prepared for shipment as specified in the Product Delivery Requirements section.

16. STORAGE. Handling and storage of equipment shall be as specified in the Product Storage and Handling Requirements section.

17. INSTALLATION AND OPERATION. Installation and operation shall be as specified in respective equipment sections and the Startup Requirements section.

18. OBSERVATION OF PERFORMANCE TESTS. Where the Specifications require the presence of Engineer, initial tests shall be observed or witnessed by Engineer. Owner shall be reimbursed by Contractor for all costs of subsequent visits by Engineer to witness or observe incomplete tests, retesting, or subsequent tests.

End of Section



Section 01612

PRODUCT DELIVERY REQUIREMENTS

1. SCOPE. This section covers packaging and shipping of materials and equipment.

2. PREPARATION FOR SHIPMENT. All equipment shall be suitably packaged to facilitate handling and to protect against damage during transit and storage. All equipment shall be boxed, crated, or otherwise completely enclosed and protected during shipment, handling, and storage. All equipment shall be protected from exposure to the elements and shall be kept dry at all times.

Painted and coated surfaces shall be protected against impact, abrasion, discoloration, and other damage. Painted and coated surfaces which are damaged prior to acceptance of equipment shall be repainted to the satisfaction of Engineer.

Grease and lubricating oil shall be applied to all bearings and similar items.

3. SHIPPING. Before shipping each item of equipment shall be tagged or marked as identified in the delivery schedule or on the Shop Drawings. Complete packing lists and bills of material shall be included with each shipment.

End of Section



## Section 01614

### PRODUCT STORAGE AND HANDLING REQUIREMENTS

1. SCOPE. This section covers delivery, storage, and handling of materials and equipment.

2. DELIVERY. Contractor shall bear the responsibility for delivery of equipment, spare parts, special tools, and materials to the site and shall comply with the requirements specified herein and shall provide required information concerning the shipment and delivery of the materials specified in this Contract. These requirements also apply to any subsuppliers making direct shipments to the Site.

Contractor shall, either directly or through contractual arrangements with others, accept responsibility for the safe handling and protection of the equipment and materials furnished under this Contract before and after receipt at the port of entry. Acceptance of the equipment shall be made after it is installed, tested, placed in operation and found to comply with all the specified requirements.

All items shall be checked against packing lists immediately on delivery to the site for damage and for shortages. Damage and shortages shall be remedied with the minimum of delay.

Delivery of portions of the equipment in several individual shipments shall be subject to review of Engineer before shipment. When permitted, all such partial shipments shall be plainly marked to identify, to permit easy accumulation, and to facilitate eventual installation.

3. STORAGE. Upon delivery, all equipment and materials shall immediately be stored and protected until installed in the Work.

Stacked items shall be suitably protected from damage by spacers or load distributing supports that are safely arranged. No metalwork (miscellaneous steel shapes and reinforcing steel) shall be stored directly on the ground. Masonry products shall be handled and stored in a manner to hold breakage, chipping, cracking, and spalling to a minimum. Cement, lime, and similar products shall be stored off the ground on pallets and shall be covered and kept completely dry at all times. Pipe, fittings, and valves may be stored out of doors, but must be placed on wooden blocking. PVC pipe, geomembranes, plastic liner, and other plastic materials shall be stored off the ground on pallets and protected from direct sunlight.

Pumps, motors, electrical equipment, and all equipment with antifriction or sleeve bearings shall be stored in weathertight structures maintained at a temperature

above 60°F. Electrical equipment controls, and insulation shall be protected against moisture and water damage. All space heaters furnished in equipment shall be connected and operated continuously.

Equipment having moving parts, such as gears, bearings, and seals, shall be stored fully lubricated with oil, grease, etc., unless otherwise instructed by the manufacturer. Manufacturer's storage instructions shall be carefully followed by Contractor.

When required by the equipment manufacturer, moving parts shall be rotated a minimum of twice a month to ensure proper lubrication and to avoid metal to metal "welding". Upon installation of the equipment, Contractor shall, at the discretion of Engineer, start the equipment at one-half load for an adequate period of time to ensure that the equipment does not deteriorate from lack of use.

When required by the equipment manufacturer, lubricants shall be changed upon completion of installation and as frequently as required thereafter during the period between installation and acceptance. New lubricants shall be put into the equipment by Contractor at the time of acceptance.

Equipment and materials shall not show any pitting, rust, decay, or other deleterious effects of storage when installed in the Work.

In addition to the protection specified for prolonged storage, the packaging of spare units and spare parts shall be for export packing and shall be suitable for long-term storage in a damp location. Each spare item shall be packed separately and shall be completely identified on the outside of the container.

4. HANDLING. Stored items shall be laid out to facilitate their retrieval for use in the Work. Care shall be taken when removing the equipment for use to ensure the precise piece of equipment is removed and that it is handled in a manner that does not damage the equipment.

During handling, carbon steel constructed material including chains, straps, and forks on lifting equipment shall not directly contact any equipment or material constructed of stainless steel. It shall be the Contractor's responsibility to correct any carbon steel contamination of stainless steel.

End of Section

Section 01615

EQUIPMENT AND VALVE IDENTIFICATION

PART 1 – GENERAL

1-1. SCOPE. This section covers the furnishing and installation of nameplates and tags for identification of equipment, valves, panels, and instruments.

1-2. GENERAL. Except as otherwise specified in equipment, valve, and instrumentation sections, nameplates and tags shall be as specified herein. Nameplates or tags shall be provided for all equipment, valves, operator interfaces, control and electrical panels, cabinets, instruments, and instrument racks that have been named and/or tagged on the Drawings.

1-3. SUBMITTALS. Drawings and data shall be submitted in accordance with the requirements of the Submittals Procedures section for each type of tag provided including materials, colors, sizes, letter sizes, and installation instructions.

PART 2 - PRODUCTS

2-1. EQUIPMENT NUMBER PLATES. Not used.

2-2. EQUIPMENT INFORMATION PLATES. Not used.

2-3. VALVE AND GATE TAGS.

2-3.01. Temporary Tags. Each valve and gate with an identifying number indicated on the Drawings or listed in the valve or gate schedule, shall be tagged or marked in the factory with the identifying number.

2-3.02. Permanent Tags. All valves and gates, except buried or submerged valves, that have been assigned a number on the Drawings or in the valve or gate schedule, shall be provided with a permanent number plate. Tags shall be permanently attached to valves and gates with stainless steel mechanical fasteners or with stainless steel chains. Numerals shall be 3/4 inch high and shall be black baked enamel on an anodized aluminum plate.

All buried valves shall be tagged with a brass plate cast into a 6-inch by 6 inch concrete pad at grade next to the valve box. The valve number shall be engraved in the brass plate with lettering and numerals at least 1 inch high.

2-4. PANEL NAMEPLATES. Not used

2-5. INSTRUMENT TAGS. Not used.

PART 3 – EXECUTION

Not used.

End of Section





- Advise Owner of pending insurance changeover requirements.
- Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.
- Complete startup and testing of systems and equipment.
- Perform preventive maintenance on equipment used prior to Substantial Completion.
- Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems. Submit demonstration and training video recordings specified elsewhere.
- Advise Owner of changeover in utility services.
- Participate with Owner in conducting inspection and walkthrough with local emergency responders.
- Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
- Complete final cleaning requirements.
- Touch up paint and otherwise repair and restore marred exposed finishes to eliminate visual defects.

1.4. Inspection. Contractor shall submit a written request for inspection to determine Substantial Completion a minimum of 10 days prior to date the Work will be completed and ready for final inspection and tests. On receipt of request, Engineer will either proceed with inspection or notify Contractor of unfulfilled requirements. Engineer will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Engineer, that must be completed or corrected before certificate will be issued.

- Contractor shall request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.
- Results of completed inspection will form the basis of requirements for final completion.

2. FINAL COMPLETION PROCEDURES. Procedures for achieving Final Completion on the Project shall be as indicated in the Division 00 Sections and as indicated below.

2.1. Submittals Prior to Final Completion. Contractor shall submit the following to Engineering before requesting final inspection for determining final completion:

- Submit a final Application for Payment
- Certified List of Incomplete Items: Certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
- Certificate of Insurance: Submit evidence of final, continuing insurance coverage complying with insurance requirements.

- Submit final completion photographic documentation.

2.2. Inspection. Submit a written request for final inspection to determine acceptance a minimum of 10 days prior to date the work will be completed and ready for final inspection and tests. On receipt of request, Engineer will either proceed with inspection or notify Contractor of unfulfilled requirements. Engineer will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.

Contractor shall request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

3. SUBMITTAL OF PROJECT WARRANTIES. Project Warranty information and documentation shall be submitted as indicated in the Division 00 Sections and as indicated below.

3.1. Time of Submittal. Contractor shall submit written warranties on request of Engineer for designated portions of the Work where warranties are indicated to commence on dates other than date of Substantial Completion, or when delay in submittal of warranties might limit Owner's rights under warranty.

3.2. Partial Occupancy. Not used.

3.3. Warranty Documentation. Contractor shall organize warranty documents into an orderly sequence based on the table of contents of Project Specifications.

Where warranty documentation is electronic, Contractor shall submit warranties and bonds in PDF format. Assemble complete warranty and bond submittal package into a single electronic PDF file with bookmarks enabling navigation to each item. Provide bookmarked table of contents at beginning of document.

Where warranty documentation is in hard copy format, Contractor shall submit warranties and bonds as follows:

- Bind warranties and bonds in heavy-duty, three-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch (215-by-280-mm) paper.
- Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of Installer.

- Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project name, and name of Contractor.

End of Section





Section 02050

EXCAVATED MATERIAL DISPOSAL

PART 1 - GENERAL

1-1. SCOPE. This Section covers disposal of material generated from microtunneling.

All unsuitable materials shall be removed from the site and disposed of by the Contractor at no additional cost to the Owner.

1-2. RELATED SECTIONS. The work of the following Sections is related to the work of this Section. Other Sections, not referenced below, may also be related to the proper performance of this work. It is the Contractor's responsibility to perform all Work required by the Contract Documents.

Section 02202, Trenching and Backfilling  
Section 02231, Jack & Bore

1-3. REFERENCE STANDARDS. This Section incorporates by reference the latest revision of the following documents. These references are a part of this Section as specified and modified. In case of conflict between the requirements of this Section and those of a listed document, the requirements of this Section shall prevail.

- a. Code of Federal Regulations (CFR): 40 CFR 258.

1-4. SUBMITTALS. The following documents shall be submitted in accordance with the Submittals section.

- a. Permits for any proposed off-site disposal sites if required by local, state and federal ordinances.
- b. Written permission from the property owner of proposed off-site disposal site.
- c. Data to document that excavated materials managed offsite meet NC DENR DEMLR requirements.

PART 2 – PRODUCTS Not Used.

## PART 3 - EXECUTION

3-1. SALVAGEABLE MATERIAL. Not Used.

3-2. EXCESS MATERIAL.

- a. Vegetation, rubble, broken concrete, debris, asphaltic concrete pavement, excess soil, rock, and other materials shall become the property of Contractor and shall be removed from the job site and disposed of legally, unless otherwise indicated on the drawings.
- b. Excess soil may be deposited on private property when written permission is obtained from the owner in accordance with Submittals Paragraph 1-4.
- c. Contractor shall verify the flood plain status of any proposed disposal site and shall not dispose of excavated materials in an area designated as being within the 100-year Flood Hazard Area.
- d. Waste materials shall be removed daily from the site by the Contractor, such that the site is maintained in a neat and orderly condition.

End of Section



## Section 02202

### TRENCHING AND BACKFILLING

#### PART 1 - GENERAL

1-1. SCOPE. This section covers clearing, grubbing, and preparation of the site; removal and disposal of all debris; excavation and trenching; tunneled (trenchless construction) crossings; the handling, storage, transportation, and disposal of all excavated material; all necessary sheeting, shoring, and protection work; preparation of subgrades; pumping and dewatering as necessary; protection of adjacent property; backfilling; pipe embedment; surfacing and grading; and other appurtenant work.

1-2. GENERAL. With reference to the terms and conditions of the construction standards for excavations set forth in OSHA "Safety and Health Regulations for Construction", Chapter XVII of Title 29, CFR, Part 1926, Contractor shall employ a competent person and, when necessary based on the regulations, a licensed or registered professional engineer, to act upon all pertinent matters of the work of this section.

1-3. SUBMITTALS. Drawings, specifications, and data covering the proposed materials shall be submitted in accordance with the Submittals Procedures section.

At least 30 days before starting construction on the sheeting and shoring, and in accordance with the OSHA requirements identified above, the Contractor shall ensure that the sheeting and shoring design engineer shall complete and submit to Engineer the Protection System Design Certificate (Figure 2-02202) and the Contractor shall use the sheeting and shoring design. If required by the OSHA requirements identified above or to protect existing facilities, the Contractor shall submit a separate certificate for each unique design. If required for protection of existing facilities or as required by the OSHA regulations identified above, the certificate(s) shall be signed and sealed by the registered professional engineer that designed the protection system.

1-3.01. Filter Fabric Data. Complete descriptive and engineering data for the fabric shall be submitted. Data submitted shall include:

A 12 inch square sample of fabric.

Manufacturer's descriptive product data.

Installation instructions.

1-3.02. Embedment and Backfill Materials. Complete test results covering tests performed by an independent commercial testing laboratory retained by the Contractor for all materials described in the Materials Testing section shall be submitted.

1-4. BASIS FOR PAYMENT.

1-4.01. Trench Sheeting. No additional payment above the Contract Price will be made for trench sheeting left in place.

1-5. INSURANCE. Professional liability insurance shall be provided as specified in the General and Supplementary Conditions sections.

PART 2 - PRODUCTS

2-1. MATERIALS.

2-1.01. Filter Fabric. The fabric shall be provided in rolls wrapped with covering for protection from mud, dirt, dust, and debris.

2-1.01.01. Filter Fabric Type A. Filter fabric Type A shall be provided for installation at locations indicated on the Drawings and as specified herein. Filter Fabric Type A shall be a nonwoven fabric consisting of only continuous chains of polymeric filaments or yarns of polyester formed into a stable network by needle punching. The fabric shall be inert to commonly encountered chemicals; shall be resistant to mildew, rot, ultraviolet light, insects, and rodents; and shall have the indicated properties:

<u>Property</u>	<u>Test Method</u>	<u>Unit</u>	<u>Minimum Average Roll Value *</u>
Fabric Weight	ASTM D3776	oz/yd <sup>2</sup>	5.7
Grab Strength	ASTM D4632	lb.	155
Grab Elongation	ASTM D4632	percent	50
Mullen Burst Strength	ASTM D3786	psi	190
Apparent Opening Size	CW-02215	U.S. Standard Sieve Size	70

\* Minimum average roll value in weakest principal direction.

2-1.01.02. Filter Fabric Type B. Not used.

2-1.02. Polyethylene Film. Polyethylene film beneath concrete slabs or slab base course material shall be Product Standard PS17, 6 mil minimum thickness.

2-1.03. Tunnel Materials. All tunnel materials shall be in accordance with the Jack and Bore specification.

2-1.04. Backfill Materials.

2-1.04.01. Job Excavated Material. Job excavated material may be used for either uncompacted or compacted trench backfill when the job excavated material is finely divided and free from debris, organic material, cinders, corrosive material, and stones larger than 3 inches in greatest dimension. Masses of moist, stiff clay shall not be used.

2-1.04.02. Inundated Sand Fill. Not used.

2-1.04.03. Graded Gravel Fill. Graded gravel for compacted trench backfill shall conform to the following gradation:

<u>Sieve Size</u>	<u>Percent Passing by Weight</u>
1 inch	100
3/4 inch	85 – 100
3/8 inch	50 – 80
No. 4	35 – 60
No. 40	15 – 30
No. 200	5 – 10

The gravel mixture shall contain no clay lumps or organic matter. The fraction passing the No. 4 sieve shall have a liquid limit not greater than 25 and a plasticity index not greater than 5.

2-1.04.04. Granular Fill. Granular fill material shall be crushed rock or gravel. Granular fill shall be free from dust, clay, and trash; shall be hard, durable, and non-friable; and shall be graded 3/4 inch to No. 4 as defined in ASTM C33 for No. 67 coarse aggregate. Granular fill shall meet the quality requirements for ASTM C33 coarse aggregate.

2-1.05. Controlled Low Strength Material (CLSM) Fill. CLSM shall consist of a mixture of Portland cement, fly ash, sand, and water and shall be placed at locations indicated on the Drawings or as directed by Engineer. The class of CLSM shall be as specified below.

The type of cement in CLSM shall be ASTM C150 Type I. The class of fly ash in CLSM shall be ASTM C618 Class C, except loss on ignition shall not exceed 4 percent. Fine aggregate in CLSM shall be clean natural sand, ASTM C33, except that clay particles shall not exceed one percent. Water in CLSM shall be potable.

Contractor shall design and test the CLSM and submit the mix design and test results to Engineer for review and acceptance. Initial set time shall be 8 hours plus or minus one hour as determined by ASTM C403. CLSM shall have an efflux time of 10 to 26 seconds through a special flow cone with a 1/2 inch discharge tube.

The batch proportions accepted by Engineer shall apply only for materials from the same source and having the same characteristics as the materials used in the mix design. Materials from any other source shall be used only with the acceptance of Engineer. If a change in sources of materials is proposed, a new mix design shall be developed by Contractor before the new material is used. When unsatisfactory results or other conditions make it necessary, Contractor shall develop a new mix design to obtain the desired results.

During the progress of the work, no change shall be made in the batch proportions of the ingredients without the acceptance of Engineer.

2-1.05.01. Class A CLSM. The initial trial mixture for Class A CLSM shall consist of the following minimum proportions per cubic yard:

Cement	50 lb.
Fly Ash	250 lb.
Sand (SSD)	2860 lb.
Water	370 lb.
Air Entraining Agent	6 percent
Compressive strength range at 56 days	100-150 psi

2-1.05.02. Class B CLSM. Not used.

2-1.05.03. Class C CLSM. Not used.

2-1.06. Pipe Embedment Material. Pipe embedment material shall be placed as indicated in Figure 1-02202.

2-1.06.01. Granular Embedment. Granular embedment shall consist of crushed rock and crushed gravel or pea gravel, meeting the quality and gradation requirements of coarse aggregate size number 7 of ASTM C33.

2-1.06.02. Hand Placed Embedment. Hand placed embedment shall be finely divided job excavated or imported material, free from organic materials, debris, and stones.

2-1.06.03. Compacted Embedment. Compacted embedment shall be finely divided job excavated material free from debris, organic material, and stones. Graded gravel may be substituted for compacted embedment. Granular embedment may be substituted for all or part of the compacted embedment at the option of the Contractor.

## 2-2. MATERIALS TESTING.

2-2.01. Preliminary Review of Materials. As stipulated in the Quality Control section, all tests required for preliminary review of materials shall be made by an acceptable independent testing laboratory at the expense of Contractor. Two initial gradation tests shall be made for each type of embedment, fill, backfill, or other material, and one additional gradation test shall be made for each additional 500 tons of each material delivered to the site. In addition, one set of initial Atterberg Limits test shall be made for each fill materials containing more than 20 percent by weight passing the No. 200 sieve. One additional Atterberg Limits test shall be made for each additional 500 tons of each material delivered to the site.

All material testing on CLSM shall be made by an independent testing laboratory at the expense of Contractor.

2-2.02. Field Testing Expense. All moisture-density (Proctor) tests and relative density tests on the materials, and all in-place field density tests, shall be made by an independent testing laboratory at the expense of Contractor. Contractor shall provide access to the materials and work area and shall assist the laboratory as needed in obtaining representative samples.

2-2.03. Required Tests. For planning purposes, the following guidelines shall be used for frequency of field tests. Additional tests shall be performed as necessary for job conditions and number of failed tests. Test results shall be submitted as specified in the Submittals Procedures section.

- a. Two moisture density (Proctor) tests in accordance with ASTM D698 (or, when required, ASTM D1557), or two relative density tests in accordance with ASTM D4253 and D4254 for each type of general fill, designated fill, backfill, or other material proposed.
- b. In-place field density and moisture tests (ASTM D2922 and ASTM

- D3017) at intervals of 1000 feet maximum along the trench.
- c. One in-place field density and moisture test (ASTM D2922 and ASTM D3017) for every 200 cubic yards of backfill.
  - d. One in-place density and moisture test (ASTM D2922 and ASTM D3017) whenever there is a suspicion of a change in the quality of moisture control or effectiveness of compaction.
  - e. Additional gradation, Proctor, and relative density tests whenever the source or quality of material changes.
  - f. Testing of CLSM shall be as follows:
    - Compressive Strength. For every 200 cubic yards of CLSM placed, fill four 6 by 12 inch plastic cylinder molds to overflowing and then tap sides lightly. Cure cylinders in the molds covered until time of testing, at least 14 days. Strip the cylinders carefully using a knife to cut away the plastic mold. Cap the cylinders with high strength gypsum plaster or other capping process that will not break these low strength materials. Test cylinders in accordance with ASTM C39. Two cylinders shall be tested at 7 days and the other two cylinders shall be tested at 56 days.
    - Flow of Fill. Once each day that CLSM is placed, test the fill material in accordance with ASTM C939 for the efflux time. Wet screening may be required to remove coarse particles.
    - Unit Weight and Yield. Once each day that CLSM is placed, determine unit weight and yield in accordance with ASTM C138.
    - Air Content. Once each day that CLSM is placed, determine air content in accordance with ASTM C231.
    - Penetration Resistance. Once each day that CLSM is placed, determine early bearing strength in accordance with ASTM C403 penetration procedure.

### PART 3 - EXECUTION

3-1. CLEARING. All clearing shall be performed as necessary for access, stringing of pipeline materials, and construction of the pipeline and appurtenant structures.

3-2. EXCAVATION. Excavations shall provide adequate working space and clearances for the work to be performed therein and for installation and removal of concrete forms. In no case shall excavation faces be undercut for extended footings.

Subgrade surfaces shall be clean and free of loose material of any kind when concrete is placed thereon.

Except where exterior surfaces are specified to be damp-proofed, monolithic concrete manholes and other concrete structures or parts thereof, which do not have footings that extend beyond the outside face of exterior walls, may be placed directly against excavation faces without the use of outer forms, provided that such faces are stable and also provided that a layer of polyethylene film is placed between the earth and the concrete.

Excavations for manholes and similar structures constructed of masonry units shall have such horizontal dimensions that not less than 6 inches clearance is provided for outside plastering.

3-2.01. Classification of Excavated Materials. No classification of excavated materials will be made for payment purposes. Excavation and trenching work shall include the removal and subsequent handling of all materials excavated or otherwise removed in performance of the work, regardless of the type, character, composition, or condition thereof.

3-2.02. Preservation of Trees. No trees shall be removed outside the permanent easement area indicated on the Drawings. Trees left standing shall be adequately protected from permanent damage by construction operations.

For limits of tree removal along pipeline routes, see the Temporary Facilities section under "Protection of Public and Private Property".

3-2.03. Blasting. Blasting will be permitted when approved by Owner, utilities, and all other appropriate agencies and authorities where the Work is to be performed. Blasting shall be performed in accordance with all laws, regulations, and ordinances in effect at the time of blasting and required by the authority having jurisdiction thereover. Contractor shall engage the services of a qualified blasting engineer to develop blasting procedures and of an independent firm to perform pre-blast and post-blast surveys and assist in monitoring blasting operations.

Contractor shall notify all affected adjacent property occupants at least 24 hours prior to any blasting. Contractor shall be responsible for all damage caused by blasting operations and shall be responsible for responding to and resolving all complaints. Suitable methods shall be employed to confine all materials lifted by blasting within the limits of the excavation or trench. Provide adequate blanket protection to ensure that there will not be fragments of rock or other debris flying through the air when discharging explosives.

All rock which cannot be handled, crushed, processed, and compacted as earth shall be kept separate from other excavated materials and shall not be mixed with backfill or embankment materials except as specified or directed.

Blasting or other use of explosives for excavation adjacent to existing utilities, structures, and other facilities shall be in conformity with the requirements of the local ordinance and the authority having jurisdiction thereover and shall not cause damage to any adjacent structures. Contractor shall consult with and obtain written approval for blasting procedures from the appropriate utility or agency before blasting adjacent to their utilities, structures, or other facilities. Certain utilities, including gas pipelines and fiber optics, and agencies have requirements that will not permit blasting adjacent to or within a minimum distance from their utilities or structures, including utilities and structures outside the construction easements or on the opposite side of the street, if applicable. The blasting procedures shall be in conformity with the requirements of the utility, if applicable. Prior to blasting, Contractor shall submit to Owner, through Engineer, a copy of the detailed blasting procedure including, but not limited to, blasting consultant, blasting plan, blasting procedures, and blast monitoring sealed by the blasting engineer for record purposes.

A blasting report shall be submitted within 24 hours following each blast. The blasting report form shall include date, time, location, and all blast measurement records. A copy of the blast report form shall be included in the detailed blast procedure submitted for review.

All complaints received regarding blasting shall be submitted in writing to Engineer within 24 hours or receipt. Complaint report shall include date and time of complaint, name and address of complaining party, description of complaint and date and time of blast. A copy of the blast complaint form shall be included in the detailed blast procedure submitted for review.

Contractor shall be responsible for obtaining all required blasting permits from the city, county, state and federal agencies and shall provide sufficient prior notice as specified by code, ordinance or other regulation to the county engineer, county sheriff, fire districts, police departments, and all other appropriate agencies and authorities where the blasting is to be performed. A copy of the blasting permit shall be on the site before and during the blasting operations. Contractor shall furnish to Owner a copy of all blasting permits at least 7 days prior to blasting. Contractor to employ personnel certified by Union County to execute blasting operations if the County requires such certification. Explosive permits shall be obtained from the County as per County requirements.

Any damage to existing construction or other features caused by blasting operations to be repaired and paid for by Contractor.

3-2.03.01. Pre-blast Survey. Contractor shall perform a pre-blast survey of all utilities, structures, and other facilities adjacent to the blast sites to determine the conditions of each utility, house, building, bridge, overpass, and other structures and facilities susceptible to damage from blasting operations. The pre-blast



survey shall include all structures and utilities within a minimum of 500 feet radius of the area to be blasted. The survey notification to all property owners, tenants, utilities, and other agencies and the area of survey shall be in conformity with the requirements of the authority having jurisdiction thereover or as determined by Contractor's insurance company if no local ordinance applies. Contractor shall submit the pre-blast survey report for record purposes, to Owner at least 30 days prior to blasting.

3-2.03.02. Blast Monitoring. Prior to the start of Contractor's blasting, Contractor shall measure background ground vibrations.

Seismographs shall be placed on the ground adjacent to structures subjected to ground shock to measure peak particle velocity components in three mutually perpendicular directions during blasting operations.

The peak particle velocity, defined as the maximum of the three velocity components of vibration, at any location shall not exceed values that will cause damage to the adjacent structures. Air overpressure shall be measured at adjacent structures. Air overpressure at adjacent structures shall not exceed values that will cause damage to the adjacent structures or personnel. The maximum peak particle velocity and air overpressure values that will not cause damage shall be determined by the blasting engineer retained by Contractor and shall be stated in the blasting procedures.

Contractor shall submit measurement records of the blast monitoring to Owner for record purposes within 24 hours after each blast.

3-2.03.03. Post-blast Survey. Contractor shall perform a post-blast survey of the same utilities, structures, and other facilities surveyed in the pre-blast survey to determine the effect of the blasting operations. Contractor shall submit the post-blast survey report to Owner for record purposes within 14 days after completion of blasting.

3-2.04. Dewatering. Dewatering equipment shall be provided to remove and dispose of all surface water and groundwater entering excavations, trenches, or other parts of the work. Each excavation shall be kept dry during subgrade preparation and continually thereafter until the structure or tunnel to be built, or the pipe to be installed therein, is completed to the extent that no damage from hydrostatic pressure, flotation, or other cause will result.

All excavations for concrete structures or trenches which extend down to or below groundwater shall be dewatered by lowering and keeping the groundwater level to the minimum depth of 12 inches, beneath such excavations. The specified dewatering depth shall be maintained below the prevailing bottom of excavation at all times.

Surface water shall be diverted or otherwise prevented from entering excavations or trenches to the greatest extent possible without causing damage to adjacent property.

Contractor shall be responsible for the condition of any pipe or conduit which he may use for drainage purposes, and all such pipe or conduit shall be left clean and free of sediment.

Contractor shall obtain from the appropriate agencies and authorities, the dewatering and stormwater discharge permits required to remove and dispose of groundwater, surface water, and any other water used in Contractor's operations. The permits shall be obtained prior to start of construction.

3-2.05. Sheeting and Shoring. Except where banks are cut back on a stable slope, excavations for structures and trenches shall be supported with steel sheet piling and shoring as necessary to prevent caving or sliding.

Sheet piling or other excavation support systems shall be in accordance with the Contractor Designed Ground Support Systems specification.

A movable trench support may be used, provided care is exercised in placing and moving the trench box or support bracing to prevent movement of the pipe or disturbance of the pipe bedding and backfill. Any voids left in the trench wall or embedment material by support removal shall be carefully filled with granular embedment material compacted as specified herein.

3-2.06. Stabilization. Sub-grades for concrete structures and trench bottoms shall be firm, dense, and thoroughly compacted and consolidated; shall be free from mud and muck; and shall be sufficiently stable to remain firm and intact under the feet of the workers.

Sub-grades for concrete structures or trench bottoms which are otherwise solid, but which become mucky on top due to construction operations, shall be reinforced with crushed rock or gravel as specified for granular fills. The stabilizing material shall be placed in a manner that no voids remain in the granular fill. All excess granular fill with unfilled void space shall be removed. The finished elevation of stabilized sub-grades shall not be above sub-grade elevations indicated on the Drawings.

3-3. TRENCH EXCAVATION. No more trench shall be opened in advance of pipe laying than is necessary to expedite the work. One block or 400 feet, whichever is the shorter, shall be the maximum length of open trench on any line under construction.

Except where tunneling is indicated on the Drawings, is specified, or is permitted by Engineer, all trench excavation shall be open cut from the surface.

Prior to excavation, Contractor shall contact local underground alert hotlines, "NC 811" and/or individual utility owners for marking underground utilities. Once utilities are marked, Contractor shall hand dig or pothole to expose the existing utilities. A survey shall be made of the utility size, material, location, and elevation prior to trench excavation and information shall be recorded on the record Drawings maintained by the Contractor.

3-3.01. Alignment, Grade, and Minimum Cover. The alignment and grade or elevation of each pipeline shall be fixed and determined from offset stakes. Vertical and horizontal alignment of pipes, and the maximum joint deflection used in connection therewith, shall be in conformity with requirements of the section covering installation of pipe.

Where pipe grades or elevations are not definitely fixed by the Drawings, trenches shall be excavated to a depth sufficient to provide a minimum depth of backfill cover over the top of the pipe of 48 inches over pipes below paved and graded streets and, of 48 inches over pipes in other locations. Greater pipe cover depths may be necessary on vertical curves or to provide adequate clearance beneath existing pipes, conduits, drains, drainage structures, or other obstructions encountered at normal pipe grades. Measurement of pipe cover depth shall be made vertically from the outside top of pipe to finished ground or pavement surface elevation, except where future surface elevations are indicated on the Drawings.

3-3.02. Maximum Trench Widths. Not used.

3-3.03. Minimum Trench Widths. Except when maximum trench width is required for certain conduits, trenches shall be excavated to the minimum trench widths indicated in the following table. Trenches shall be excavated to a width which will provide adequate working space and sidewall clearances for proper pipe installation, jointing, and embedment.

<u>Nominal Pipe Size</u>	<u>Minimum Trench Width</u>	<u>Clearance</u>
Less than 27 in	Pipe OD plus 24 in	12 in
27 in through 60 in	Pipe OD plus nominal pipe size	ID/2
Greater than 60 in	Pipe OD plus 70 in	30 in

Clearance = Minimum sidewall clearance  
OD = Outside diameter (or span) of conduit  
ID = Inside diameter (or span) of conduit.

Specified minimum sidewall clearances are not minimum average clearances but are minimum clear distances which will be required to the trench excavation or the trench protective system.

Cutting trench banks on slopes to reduce earth load to prevent sliding and caving shall be used only in areas where the increased trench width will not interfere with surface features or encroach on right-of-way limits.

3-3.04. Mechanical Excavation. The use of mechanical equipment will not be permitted in locations where its operation would cause damage to trees, buildings, culverts, or other existing property, utilities, or structures above or below ground. In all such locations, hand excavating methods shall be used.

Mechanical equipment used for trench excavation shall be of a type, design, and construction, and shall be so operated, that the rough trench excavation bottom elevation can be controlled, and that trench alignment is such that pipe, when accurately laid to specified alignment, will be centered in the trench with adequate sidewall clearance. Undercutting the trench sidewall to obtain sidewall clearance will not be permitted.

In locations where maximum trench widths are required for designated rigid conduits, mechanical equipment shall be operated so that uniform trench widths and vertical sidewalls are obtained at least from an elevation 12 inches above the top of the installed pipe to the bottom of the trench.

3-3.05. Cutting Concrete Surface Construction. Cuts in concrete pavement and concrete base pavements shall be no larger than necessary to provide adequate working space for proper installation of pipe and appurtenances. Cutting shall be started with a concrete saw in a manner which will provide a clean groove at least 1-1/2 inches deep along each side of the trench and along the perimeter of cuts for structures.

Concrete pavement and concrete base pavement over trenches excavated for pipelines shall be removed so that a shoulder not less than 6 inches in width at any point is left between the cut edge of the pavement and the top edge of the trench. Trench width at the bottom shall not be greater than at the top and no undercutting will be permitted. Pavement cuts shall be made to and between straight or accurately marked curved lines which, unless otherwise required, shall be parallel to the center line of the trench.

Pavement removal for connections to existing lines or structures shall not exceed the extent necessary for the installation.

Where the trench parallels the length of concrete walks, and the trench location is all or partially under the walk, the entire walk shall be removed and replaced.



- ductile iron, bar-wrapped concrete, and vitrified clay pipelines, and for all other pipelines not otherwise specified.
- c. Class B Special Embedment. Class B special embedment shall be used for HDPE, PVC, ABS, FRP, GRP, steel or stainless steel pipe where the process fluid design maximum temperature is 140° F or higher such as for pressurized air service, and when recommended by the pipe manufacturer.
  - d. Class C Embedment. Class C embedment shall be used for all reinforced concrete and prestressed concrete pipelines.

3-4.02. Embedment for Ductile Iron, Steel, FRP, and PVC Pipelines. Granular embedment for ductile iron, coal tar coated steel, FRP, and PVC pipelines shall be crushed rock or crushed gravel with rounded or sub-rounded particles.

Crushed rock or gravel with sharp edges which could cause significant scratching or abrasion of the pipe or damage to the polyethylene tube protection shall not be used unless otherwise approved by Engineer and all damage is repaired to the satisfaction of Engineer.

3-4.03. Placement and Compaction.

3-4.03.01. Granular Embedment. Granular embedment material shall be spread and the surface graded to provide a uniform and continuous support beneath the pipe at all points between bell holes or pipe joints. It will be permissible to slightly disturb the finished subgrade surface by withdrawal of pipe slings or other lifting tackle.

After each pipe has been graded, aligned, and placed in final position on the bedding material, and shoved home, sufficient pipe embedment material shall be deposited and compacted under and around each side of the pipe and back of the bell or end thereof by shovel slicing or other suitable methods to hold the pipe in proper position and alignment during subsequent pipe jointing and embedment operations.

Placing and compaction of embedment material shall not damage the pipe coating or polyethylene encasement. Embedment material shall not be dumped directly on the pipe or polyethylene encasement unless a suitable temporary isolation layer such as a 60 mil HDPE sheeting, is used to cover the pipe and polyethylene encasement.

Embedment material shall be deposited and compacted uniformly and simultaneously on each side of the pipe to prevent lateral displacement.

Granular embedment shall be placed in layers not more than 6 inches deep and compacted as specified.

Each lift of granular embedment material shall be vibrated with a mechanical probe type vibrator or shovel sliced during placement to ensure that all spaces beneath the pipe are filled. Granular embedment shall be placed in maximum lift thickness of 6 inches and compacted. Each lift of embedment material shall be compacted with three passes (round trip) of a platform type vibrating compactor and to at least 70 percent relative density as determined by ASTM D4253 and D4254.

Where indicated on the Drawings or where silt, fine sand, or soft clay soils are encountered below groundwater, migration of soil into the embedment material shall be prevented by installing filter fabric Type A, or by using graded gravel in place of granular embedment. Filter fabric shall be placed on the trench surfaces so that it completely surrounds the embedment material. Joints shall be lapped 12 inches.

3-4.03.02. Compacted Embedment. Compacted embedment shall be placed in uniform layers not more than 8 inches thick and compacted to not less than 95% maximum density as determined by ASTM D698.

Where Class C embedment is required, compacted embedment shall be placed to the top of the pipe in all areas where compacted trench backfill is specified and around restrained pipe sections. Placing and compaction of embedment shall not damage the pipe or coating.

3-4.03.03. Hand Placed Embedment. Hand placed embedment shall be placed by hand shovels or using methods that prevent dropping the material for more than 24 inches above the pipe. Hand placed embedment shall be lightly tamped using hand equipment. Care shall be taken so as to not damage the pipe or coating.

3-4.04. Groundwater Barrier. Continuity of embedment material shall be interrupted by low permeability groundwater barriers to impede passage of water through the embedment.

Groundwater barriers shall be soil plugs of 3 feet in width, extending the full depth and width of granular material, and spaced not more than 400 feet apart. The soil plugs shall be constructed from soil meeting ASTM D2487 classification GC, SC, CL, or ML, and compacted to 95 percent of maximum density at near the optimum moisture content (ASTM D698).

3-5. TRENCH BACKFILL. All trench backfill above pipe embedment shall conform to the following requirements.

A layer of backfill material not more than 8 inches deep may be placed over concrete arch encasement or concrete thrust blocking after the concrete has

reached its initial set, to aid curing. No additional backfill shall be placed over arch encasement or blocking until the concrete has been in place for at least 3 days.

3-5.01. Compacted Backfill. Compacted backfill will be required for the full depth of the trench above the embedment in all locations.

The top portion of backfill beneath established lawn areas shall be finished with at least 12 inches of topsoil corresponding to, or better than that which is underlying adjoining lawn areas.

Trench backfill material shall be suitable job excavated material graded gravel and shall be as specified herein.

3-5.01.01. Job Excavated Material. Job excavated materials shall be placed in uniform layers not exceeding 8 inches in uncompacted thickness. Each layer of material shall have the best possible moisture content for satisfactory compaction. The material in each layer shall be wetted or dried as needed and thoroughly mixed to ensure uniform moisture content and adequate compaction. Increased layer thickness may be permitted for noncohesive material if Contractor demonstrates to the satisfaction of Engineer that the specified compacted density will be obtained. The method of compaction and the equipment used shall be appropriate for the material to be compacted and shall not transmit damaging shocks to the pipe. Job excavated material shall be compacted to 95 percent of maximum density at a moisture content within 2 percent of the optimum moisture content as determined by ASTM D698 when that test is appropriate, or to 70 percent relative density as determined by ASTM D4253 and D4254 when those tests are appropriate.

3-5.01.02. Inundated Sand. Not used.

3-5.01.03. Graded Gravel. Not used.

3-5.02. Ordinary Backfill. Not used.

3-5.03. Water-Settled Earth Backfill. Settlement or consolidation of trench backfill using water jetting or ponding shall not be performed.

3-5.04. Structure Backfill. Backfill around manholes and small concrete vaults shall meet the requirements specified for compacted trench backfill.

3-5.05. Controlled Low Strength Material (CLSM). Not used.



3-6. TUNNEL EXCAVATION. Pipelines beneath roads and railroads shall be constructed in tunnels of the type designated on the Drawings, in conformity with the specifications which follow.

- 02231 – Jack & Bore
- 02050 – Excavated Material Disposal
- 02309 – Geotechnical Instrumentation
- 02330 – Tunnel Annular Backfilling
- 02340 – Contractor Designed Ground Support Systems
- 03340 – Low Density Cellular Concrete

No interruption of traffic will be permitted at any location where tunnels are required.

3-7. DRAINAGE MAINTENANCE. Trenches across roadways, driveways, walks, or other trafficways adjacent to drainage ditches or watercourses shall not be backfilled prior to completion of backfilling the trench on the upstream side of the trafficway, to prevent impounding water after the pipe has been laid. Bridges and other temporary structures required to maintain traffic across such unfilled trenches shall be constructed and maintained by Contractor. Backfilling shall be done so that water will not accumulate in unfilled or partially filled trenches. All material deposited in roadway ditches or other watercourses crossed by the line of trench shall be removed immediately after backfilling is completed, and the original section, grades, and contours of ditches or watercourses shall be restored. Surface drainage shall not be obstructed longer than necessary.

3-8. PROTECTION OF TRENCH BACKFILL IN DRAINAGE COURSES. Not used.

3-9. FINAL GRADING AND PLACEMENT OF TOPSOIL. After other outside work has been finished, and backfilling and embankments completed and settled, all areas which are to be graded shall be brought to grade at the indicated elevations, slopes, and contours. All cuts, fills, embankments, and other areas which have been disturbed or damaged by construction operations shall be surfaced with topsoil to a depth of at least 4 inches. Topsoil shall be of a quality at least equal to the existing topsoil in adjacent areas, free from trash, stones, and debris, and well suited to support plant growth. Topsoil required to provide the minimum thickness shall be imported and placed at no additional cost to the Owner.

Use of graders or other power equipment will be permitted for final grading and dressing of slopes, provided the result is uniform and equivalent to manual methods. All surfaces shall be graded to secure effective drainage. Unless otherwise indicated, a slope of at least 1 percent shall be provided.

Final grades and surfaces shall be smooth, even, and free from clods and stones, weeds, brush, and other debris. Lawn, farmland and pasture areas shall be graded to a smooth, even surface with a loose, uniformly fine texture and rolled and raked to remove ridges and fill depressions as required to meet finished grades. Power raking shall be used as needed. The surface shall be cleared of stumps, stones larger than 1 inch in diameter, roots, sticks, cable, wire, and other materials that might hinder the work or subsequent maintenance

3-10. DISPOSAL OF EXCESS EXCAVATED MATERIALS. Disposal of excess material from trench excavation sites shall be as follows. Disposal of excavated material from tunneling operations shall be in accordance with the Excavated Material Disposal specification.

Broken concrete and other debris resulting from pavement or sidewalk removal, excavated rock in excess of the amount permitted to be installed in trench backfill, debris encountered in excavation work, and other similar waste materials shall be disposed of away from the site.

Excess earth from excavations located in unimproved property may be distributed directly over the pipe trench and within the pipeline right-of-way to a maximum depth of 6 inches above the original ground surface elevation at and across the trench and sloping uniformly each way. Material thus wasted shall be carefully finished with a drag, blade machine, or other suitable tool to a smooth, uniform surface without obstructing drainage at any point. Wasting of excess excavated material in the above manner will not be permitted where the line of trench crosses or is within a railroad, public road, highway right-of-way, creek or wetland area, endangered species habitat or any other maintained area. The disposal of waste and excess excavated materials, including hauling, handling, grading, and surfacing, shall be a subsidiary obligation of Contractor and no separate payment will be made therefore.

3-11. SETTLEMENT. Contractor shall be responsible for all settlement of trench backfill which may occur within the correction period stipulated in the General Conditions.

Contractor shall make, or cause to be made, all repairs or replacements made necessary by settlement within 30 days after notice from Engineer or Owner.

End of Section

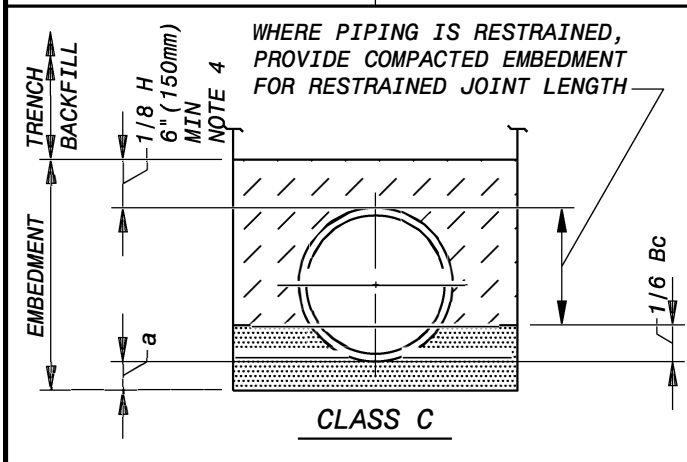
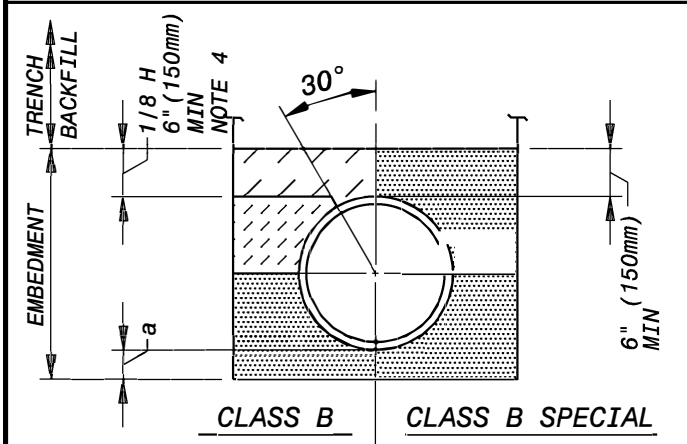
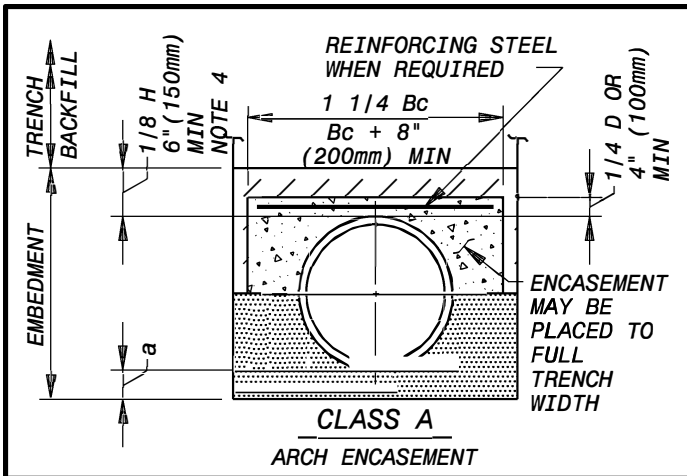


TABLE OF EMBEDMENT DEPTHS BELOW PIPE

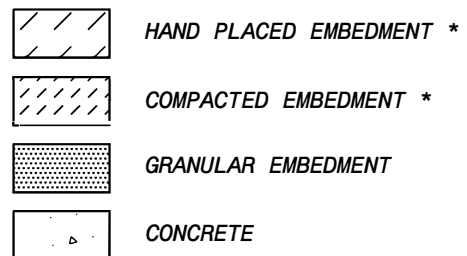
D	a		a	
	MIN SOIL	MIN ROCK	MIN SOIL	MIN ROCK
	in	mm	in	mm
27" (675 mm) & SMALLER	3	75	6	150
30" (750 mm) TO 60" (1500 mm)	4	100	9	225
66" (1650 mm) & LARGER	6	150	12	300

NOTES:

1. GRANULAR EMBEDMENT MATERIAL SHALL BE CRUSHED ROCK OR PEA GRAVEL COARSE AGGREGATE SIZE NUMBER 7 (13 TO 4.75) ASTM C33. EMBEDMENT MATERIAL SHALL BE PLACED IN LAYERS NOT MORE THAN 6" DEEP AND COMPACTED AS SPECIFIED.
2. HAND PLACED EMBEDMENT SHALL BE FINELY DIVIDED MATERIAL FREE FROM DEBRIS AND STONES.
3. COMPACTED EMBEDMENT SHALL BE FINELY DIVIDED JOB EXCAVATED MATERIAL FREE FROM DEBRIS, ORGANIC MATERIAL, AND STONES, PLACED IN UNIFORM LAYERS NOT MORE THAN 8" THICK, AND COMPACTED TO 95% MAXIMUM DENSITY AS DETERMINED BY ASTM D698; INUNDATED SAND; OR GRADED GRAVEL. GRANULAR EMBEDMENT MAY BE SUBSTITUTED FOR ALL OR PART OF THE COMPACTED EMBEDMENT.
4. EMBEDMENT ABOVE THE TOP OF THE PIPE SHALL BE AN UNCOMPACTED LAYER FOR ALL INSTALLATIONS.
5. REFER TO SPECIFICATIONS FOR GEOTECHNICAL FABRIC OR SPECIAL EMBEDMENT REQUIREMENTS FOR TRENCHES IN FINE SOILS EXTENDING BELOW GROUNDWATER LEVEL.
6. TRENCH OUTLINES DO NOT INDICATE ACTUAL TRENCH EXCAVATION SHAPE, SOIL CONDITIONS, OR PRESENCE OF SHEETING LEFT IN PLACE. EMBEDMENT MATERIAL SHALL EXTEND THE FULL WIDTH OF THE ACTUAL TRENCH EXCAVATION.
7. FOR RESTRAINED JOINT PIPE LENGTH WITH CLASS C EMBEDMENT THE BACKFILL ABOVE THE GRANULAR EMBEDMENT AND BELOW THE TOP OF THE PIPE SHALL BE COMPACTED EMBEDMENT.

LEGEND

- Bc OUTSIDE DIAMETER OF PIPE
- H COVER ABOVE TOP OF PIPE
- D NOMINAL PIPE SIZE
- a EMBEDMENT BELOW PIPE (SEE TABLE)



\* OR GRANULAR EMBEDMENT

EMBEDMENTS FOR CONDUITS

BLACK & VEATCH

FIG 1-02202



**PROTECTIVE SYSTEM  
DESIGN CERTIFICATE**

I undersigned engineer, hereby certify that the protection system for \_\_\_\_\_(trench location) has been designed by me and is in compliance with the Contract Documents.

Name: \_\_\_\_\_

State of Registration: \_\_\_\_\_

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

P.E. Number \_\_\_\_\_

Date: \_\_\_\_\_

\_\_\_\_\_  
(Seal)



## SECTION 02231

### JACK & BORE

#### PART 1 – GENERAL

1-1. SCOPE. This section contains guidelines and specifications applicable to Jack & Bore installation, as indicated on the Drawings. This section includes minimum performance requirements for Jack & Bore installation.

Contractor is responsible for determining the method used for trenchless installation. Jack & Bore specifications and references on the Drawings are provided to demonstrate the limits of the trenchless installation and establish minimum requirements. Contractor shall indicate installation method in the Detailed Work Plan submittal required below. Drill & Blast method is not acceptable.

All trenchless operations shall meet all requirements stipulated by the North Carolina Department of Transportation (NCDOT) and applicable railroad permits.

Geotechnical data (boring logs and test reports) are provided in a report dated July 22, 2016, prepared by ESP Associates, P.A., Concord, North Carolina, entitled: "Report of Subsurface Exploration Union County Pipeline West Alignment Monroe, North Carolina ESP Project No. E4B-EP08.300", consisting of 73 pages.

1-2. RELATED SECTIONS. The work of the following Sections is related to the work of this Section. Other Sections, not referenced below, may also be related to the proper performance of this work. It is the Contractor's responsibility to perform all work required by the Contract Documents.

Section 02202, Trenching and Backfilling

Section 02704, Pipeline Pressure and Leakage Testing

Section 15061, Ductile Iron Pipe

1-3. GENERAL. Any modifications, damages or detrimental consequences to existing structures, facilities or utilities as result of the Contractor's work shall be repaired and restored to its original condition as directed by the Engineer at no additional cost to the Owner.

1-4. DEFINITIONS.

1-4.01. Jack & Bore. A trenchless method of construction consisting of a horizontal jacking platform within a jacking pit. The pipe is jacked by manual control along the alignment with simultaneous excavation of the soil accomplished by rotating augers in the leading edge of the pipe's annular space. The spoil is transported to the jacking pit by helical wound auger flights rotating in the pipe.

1-4.02. Carrier Pipe. As it relates to this work, a pipe for water conveyance.

1-4.03. Casing Pipe. A direct-jacked pipe which provides initial ground support for the bore to be replaced by a direct-jacked carrier pipe. A casing pipe is not a carrier pipe.

1-4.04. Carrier Pipe Spacers/Insulators. Fabricated item for placing carrier pipe inside casing pipe.

1-4.05. Cobble. A cobble is a clast or fragment of rock having a particle size that measures three (3) inches to twelve (12) inches in the longest dimension.

1-4.06. End Seal. Material placed at the interface between the shaft and tunnel to prevent inflows of ground, groundwater, slurry, and/or lubricants into the shaft during tunneling.

1-4.07. Jacking Frame. A structural component, fitted with hydraulic cylinders, which is used to push the cutterhead and casing pipe string into the ground. The jacking frame serves to distribute the thrust load to the casing string and the reaction load to the shaft wall or thrust block.

1-4.08. Jacking Pipe. Casing pipe, specially designed, to be installed using pipe jacking construction techniques.

1-4.09. Obstructions. Objects or portions of objects located within the area to be excavated by the auger that stops forward progress. Obstructions include rock fill, boulders, concrete, stone masonry, trees, timbers, conduits, pipes, reinforced concrete, steel sheeting, or other objects that prevent forward progress of excavation. Boulders or similar materials are considered obstructions only if the size (largest dimension) is larger than one-third of the internal diameter of the casing pipe.

1-4.10. Thrust Block. An engineered structure located between the jacking frame and the shaft wall intended to spread the jacking force developed by the hydraulic cylinders over a larger surface area.



1-4.11. Zone of Active Excavation. Area located within a radial distance about a surface point immediately above the face of excavation equal to the depth to the bottom of the excavation.

1-4.12. Critical Structure. Any building, structure, roadway, bridge, pier, utility or similar construction partially or entirely located within a zone of active excavation.

#### 1-5. QUALIFICATIONS.

1-5.01. General. The Contractor or Jack & Bore Subcontractor shall demonstrate successful completion of at least five (5) previous projects within the past five (5) years using Jack & Bore methods with casing pipe at least 54-inch diameter or larger and 200 feet or greater in length using the methods proposed. Qualifications of the Contractor or Jack & Bore Subcontractor shall be submitted to the Engineer for review and approval.

1-5.02. Jack & Bore Operator. The Jack & Bore Operator shall be a trenchless specialist who shall remain on the project site during the duration of the Jack & Bore operation. The Jack & Bore Operator shall have a minimum of five (5) years experience in supervising Jack & Bore operations. Qualifications of the Jack & Bore Operator shall be submitted to the Engineer for review and approval.

1-5.03. Project Manager. A project manager shall be provided who is a graduate civil engineer, mining engineer, or geologist from an accredited college or university and has at least three (3) years of experience with at least one (1) completed trenchless installation project with shafts as a project manager. A non-college graduate may be substituted provided the individual has five (5) years of experience as a project manager on trenchless installation projects. Approval in writing from the Engineer shall be obtained for changing project managers.

1-5.04. Field Superintendent. A field superintendent shall be provided who has experience on at least three (3) separate projects within the last ten (10) years as a field superintendent of trenchless installation projects with shafts using the same excavation methods proposed by the Contractor. The field superintendent shall be in responsible charge and on site during the trenchless installation operations. The field superintendent shall demonstrate experience in the construction of trenchless installations as specified above. Approval in writing from the Engineer shall be obtained for changing superintendents.

1-5.05. Contractor shall furnish a statement of qualifications and experience to the Engineer demonstrating Subcontractor's, project manager's, field superintendent's, and trenchless equipment operators' satisfactory qualifications and experience.

1-5.06. Contractor may submit additional information that is deemed pertinent in demonstrating the required experience and qualifications.

1-6. SUBMITTALS. The following shall be submitted to the Engineer in accordance with the Submittals Procedures Section, prior to commencement of work:

1-6.01. Detailed Work Plan. A detailed work plan shall be submitted. Information shall include, but not be limited to, the following:

- a. Details of the proposed method of construction, sequence of operations, number and size of construction crew(s), hours to be worked and other pertinent information relating to these items.
- b. Material and equipment list including detailed information of type, manufacture and specifications of equipment.
- c. Capacity, number, and arrangement, of main jacks, thrust block and jacking frame details. Provide details of thrust ring, jacking controls, and pressure gages.
- d. Details of pipe lubrication and pipe lubricants used during Jack & Bore installation, including manufacturer's literature.
- e. Spoil handling, transport, and disposal procedures.
- f. A plan for monitoring surface settlement including as a minimum: description of monitoring procedures, frequency of measurement and method of measurement.
- g. Provide a Contingency Plan outlining the procedures followed if the following events occur: surface settlement, surface heave, existing utility damage and/or removal of obstructions encountered during Jack & Bore operations.
- h. Theoretical volume calculation. Contractor shall submit a calculation indicating the theoretical volume necessary to perform the trenchless excavation; a reasonable bulking factor shall be used in this calculation.
- i. A list of welding procedures and certifications of all welders to be used on the project. All welding procedures associated with the steel casing pipe shall be prequalified under the provisions of ANSI/AWS D1.1. Welding procedures shall be required for, but not necessarily limited to, longitudinal and girth or special welds for

pipe cylinders, casing joint welds, and reinforcing plates. All welding shall be performed by certified welders, welding operators, and tackers who have adequate experience in the type of materials to be used. Welders shall be qualified under the provisions of ANSI/AWS D1.1 by an independent, local, approved testing agency no more than six (6) months prior to commencing work on this project. Welding machines and electrodes similar to those proposed for this project shall be used in qualification tests. The Contractor shall bear the expense for welder qualifications.

- j. Details of the steel casing pipe to be installed indicating pipe diameter, wall thickness, method of fabrication, material properties, material strength, reinforcement details, grout and lubrication ports and fittings, joint details, and jacking station details, miscellaneous items to be furnished and/or fabricated for the pipe, and other pertinent information as applicable. Indicate the required fabrication tolerances to prevent damage to the pipe during installation and provide a certification from the pipe manufacturer indicating that the steel casing pipe is adequately designed for the project requirements. Provide details to distribute jacking forces at the ends of the pipe joints.
- k. A list of welding procedures and certifications of all welders to be used on the project. All welding procedures associated with the steel casing pipe shall be prequalified under provisions of ANSI/AWS D1.1. Welding procedures shall be required for, but not necessarily limited to, longitudinal and girth or special welds for pipe cylinders, casing joint welds, and reinforcing plates. All welding shall be performed by certified welders, welding operators, and tackers who have adequate experience in the type of materials to be used. Welders shall be qualified under the provisions of ANSI/AWS D1.1 by an independent, local, approved testing agency no more than six (6) months prior to commencing the work on this project. Welding machines and electrodes similar to those proposed for this project shall be used in qualifications tests. The Contractor shall bear the expense for welder qualifications.
- l. Design calculations demonstrating that the proposed steel casing pipe can support the maximum stresses to be imposed on the pipe during jacking. The calculations shall consider maximum ground and hydrostatic loads, jacking forces, contact grouting pressures, external loads such as live loads due to vehicle or rail traffic, construction equipment, stored materials, and any other loads which may be reasonably anticipated. All loads shall be shown and described. Include the assumed maximum drive length. Maximum

compressive bearing stresses shall not exceed specified limits. Contractor shall increase the strength of the pipe and/or pipe joints from as required herein to withstand the stresses imposed by the pipe jacking operations and such increases shall be at no additional cost to the Owner. Calculations shall confirm the steel casing pipe capacity is adequate to resist anticipated jacking loads and all other associated design loads with a minimum factor of safety of 2.5. All calculations shall be prepared, signed, and sealed by a professional engineer licensed in the project state.

- m. The Contractor shall provide an As-Built Report within fourteen (14) days of completion of steel casing pipe installation and contact grouting, but prior to carrier pipe installation, and shall include the following at a minimum:
  - 1. A summary of project information, including name of Contractor or Subcontractor, date of installation, and contact information.
  - 2. As-built record drawings of the installed steel casing pipe. The plan and profile drawings shall include the theoretical alignment, actual alignment, survey benchmarks, and other adjacent structures or features, and any other information deemed necessary by the Engineer.

1-6.02. Construction Schedule. A detailed construction schedule including, but not limited to the following, shall be provided:

- a. Preliminary progress schedule, before construction commences
- b. Bi-weekly progress schedule updates

1-6.03. Daily Report. Contractor shall provide a written daily report to Engineer detailing at a minimum the following:

- a. Supervisor name, hours worked, quantity of crew members, quantity of materials used, and a brief summary of daily activities.
- b. A detailed log recording at a minimum: supervisor name, date, daily progress, jacking pressures, spoil volume and other information deemed necessary by Engineer.
- c. Instrumentation data shall be submitted to the Engineer within 24 hours of instrument readings. Data from any monitoring point exceeding the allowable settlement or heave values shall be

reported to the Engineer immediately. If any monitoring point indicates settlement or heave beyond the allowable value, the Contractor shall implement the submitted contingency plan.

- d. Quantity of muck removed. Contractor to provide an assessment of the actual spoil volume removed during excavation and the theoretical volume required for the excavation.

1-6.04. As-Built Report. Contractor shall submit an as-built report to the Engineer within fourteen (14) days upon completion of Jack & Bore operations. At a minimum, the report shall include the following:

- a. A summary of project information.
- b. Name of Contractor, date of installation, and contact information.
- c. As-built record drawings of the installed casing and carrier pipes. The plan and profile drawing shall include the theoretical alignment, actual alignment, survey benchmark (northing, easting, and elevation), and other adjacent structures or features.

1-6.05. Excavated Material Disposal.

- a. Permits for any proposed off-site disposal sites if required by local, state, or federal ordinance.
- b. Written permission from the property owner of proposed off-site disposal site(s) along with a description of the property including its current and future land use/zoning designation.
- c. Written and signed release from property owner of off-site disposal site upon completion of disposal work.

1-6.06. Installation of Carrier Pipe.

- a. Pipe Design and Installation Method: A brief description of the method of transporting pipe into the casing; method of hoisting and positioning pipe; method of jointing and aligning pipe; and blocking plan. The planned method shall be in accordance with the pipe manufacturer recommendations.
- b. Joint Testing: Joint testing procedure and equipment to be used shall be submitted two weeks prior to testing.

No payment will be made for work until the as-built record drawings have been delivered and accepted by the Engineer.

## PART 2 – PRODUCTS

### 2-1. MATERIALS.

#### 2-1.01. STEEL CASING PIPE.

Steel casing pipe shall be a direct-jacked pipe, specifically designed for installation by jack and bore methods and shall conform to the requirements herein. Casing pipes shall be of the diameter necessary to subsequently install carrier pipe to the specified line and grade within tolerances and clearances as described by the Contract Documents. Contractor shall be fully responsible for the sufficiency of the casing pipe provided and may select a larger diameter casing or wall thickness for their means and methods, loading characteristics, site conditions, or possible interferences at no additional cost to the Owner.

Casing pipes shall be round, have smooth, even outer surfaces, and have joints that allow for easy connections between pipes. Casing pipe ends shall be square and smooth so that jacking loads are evenly distributed around the entire pipe joint. Casing pipes shall withstand the jacking forces imposed during installation and the final in-place loading conditions. The ends of the pipe shall be protected against damage during installation. Additionally:

- a. Pipe lengths shall not be more than twenty (20) feet long.
- b. Casing Pipe: Welded steel pipe shall be new, smooth wall, straight seam, conforming to ASTM A139, Grade C or proprietary non-welded steel pipe (Permalok Steel Casing Pipe or equal) shall be new and conforming to ASTM A36/A36M and ASTM A572/A572M, Grade 42. Minimum wall thickness shall be one (1) inch. Minimum yield strength shall be 42,000 psi.
  1. Welded steel casing pipe shall be butt welded.
  2. Non-welded steel casing pipe shall be manufactured by the rolled and welded cylinder method using the DSAW process in sections not less than eight (8) feet. Non-welded steel pipe connectors shall be full penetration butt welded square to the ends of the pipe sections or profiled directly on the finished section, at the manufacturer's option.
- c. Use of other casing pipe types will require prior approval of the Engineer.
- d. Casing pipes shall also meet the requirements of the roadway or railway authority having jurisdiction, as applicable.

- e. End Closure: Brick for end closures shall be common masonry brick.

2-1.02. Carrier Pipe. Ductile iron pipe shall be as specified in the Duction Iron Pipe section.

2-2. EQUIPMENT REQUIREMENTS. Jack & Bore equipment shall be manufactured by a company that specializes in design and fabrication of this type of equipment and has at least five (5) years of experience. The equipment shall be:

- a. Capable of installing steel casing pipe the length of the crossing as shown on the drawings.
- b. Provide a means for controlling line and grade in accordance with specified criteria, centering cutting head inside borehole, and preventing excessive settlement, heave or voids.

Jack & Bore equipment shall be hydraulically operated and capable of pushing the pipe in a controlled manner and compatible with the anticipated jacking loads and pipe capacity. Contractor shall monitor the jacking force applied to the pipe and ensure the jacking force does not exceed pipe manufacturer's recommendations.

### PART 3 – EXECUTION

3-1. GENERAL. The Engineer shall be notified at least ten (10) days prior to start of construction. No Jack & Bore operations shall begin until Engineer is present at the job site.

It shall be the Contractor's responsibility to carry out all Jack & Bore operations in strict conformance to the Contract Documents and obtain permits from all applicable agencies.

Contractor is required to notify North Carolina 811 at least three (3) days prior to beginning any excavation. Contractor shall perform all responsibilities outlined in accordance with North Carolina 811 guidelines, including white-lining the proposed dig area and potholing all utilities to verify their location. North Carolina 811 can be contacted at [www.nc1call.org](http://www.nc1call.org) or by dialing (800) 632-4949.

Perform work in a manner that minimizes ground loss and surface settlement. Furnish equipment, power, water, and utilities for Jack & Bore installation, pipe lubricant mixing, removal and disposal of spoil, and other work required for Jack & Bore installation.

If an obstruction is encountered which prevents completion of the installation; the pipe may be taken out of service and left in place at the discretion of the Engineer. Immediately fill the casing with flowable fill. Submit a new installation procedure and revised plans to the Engineer for approval before resuming work at another location.

3-2. SITE CONDITIONS. Conduct operations such that trucks and other construction vehicles do not create a dust nuisance in roadways and adjacent properties. Promptly clean up, remove, and dispose of any nuisance spoil or slurry spillage.

The Contractor shall continuously keep the jacking pit free from ground and surface water during operation to the extent practical and shall be prepared to implement groundwater control on short notice, even if observed water levels prior to construction are below the invert of the casing pipe.

Excavation for jacking pit, receiving pit, and spoil shall be contained onsite or hauled to an offsite dump site.

Upon completion of work, Contractor shall ensure the work site is restored to pre-construction conditions or as directed by the Engineer.

3-3. JACKING AND RECEIVING PITS. All jacking and receiving pits shall be protected with suitable fencing or barricades to prohibit unauthorized access. Jacking and receiving pits shall be shaped with heavy timber, steel sheet piling or other suitable materials that shall be of adequate strength to support the operation. Braced steel or heavy timber shall be used to support the sides of the excavation.

Steel rails or beams shall be used in the pit for placement and alignment of each pipe during installation operations.

The Contractor shall be fully responsible for the removal of pits, including the break-up, removal and disposal of concrete or cutting-off of sheeting and furnishing backfill to the normal subgrade as may be required following installation.

The jacking and receiving pits shall be backfilled and compacted in accordance with the Trenching and Backfilling section. Excavated material may be used as backfill upon completion of casing and carrier pipe installation.

### 3-4. INSTALLATION.

3-4.01. Procedures for Installation. Follow the procedures for pipe installation set forth herein.



- a. Pipe shall be jacked from the downstream end on properly braced and supported guide rails.
- b. Welding of the pipe shall be performed prior to installation. Field welds shall be complete penetration, single-bevel groove type joints that are air tight and continuous over the circumference of the pipe.
- c. Do not exceed force recommended by the manufacturer for jointing or pushing pipe.
- d. Provide a means of tracking the leading edge of the pipe using an electronic transmitting and receiving device.
- e. In the event a section of pipe is damaged during the jacking operation, jack through to the receiving pit and remove the damaged pipe accordingly. Other methods of repair may be used, subject to the approval of the Engineer.
- f. Monitor volume of material excavated and adjust auger rate to avoid loss of ground, over-excavation, settlement and surface heave.
- g. Mechanically bore through soil by a continuous auger mounted inside the pipe. The Jack & Bore operations shall be performed simultaneously, with continuous installation of casing pipe. Extend the auger a maximum of 3 inches beyond the leading edge of the casing pipe to avoid ground loss. In unstable conditions, such as granular soil, loose or flowable materials, the cutting head shall be retracted into the casing. Auger shall not be greater than the outside diameter of the casing pipe.
- h. Once the casing pipe is in place, the carrier pipe shall be installed inside the casing. The carrier pipe shall be installed with restrained joints. The carrier pipe shall be centered within the casing using stainless steel spacers. The spacers shall be equally spaced along the length of the pipe and shall be as shown on the Drawings. All carrier pipe joints in the casing shall be restrained including the first joints outside the casing pipe.

3-5. SPOIL TRANSPORT AND DISPOSAL. Spoil from Jack & Bore operations shall be removed by the helical wound flights to the jacking pit and stored onsite or disposed of properly at an offsite facility.

3-6. CONTROL OF LINE AND GRADE. Benchmarks and other survey control shall be established by the Contractor. Accuracy of the benchmarks shall be verified at the beginning of construction by the Surveyor.

If the pipe installation exceeds specified tolerances, perform corrective work as approved by the Engineer and at no additional cost to the Owner.

3-6.01. Tolerances. Install casing pipe to meet the following tolerances along the alignment:

Horizontal Tolerance: maximum of 1% from the design horizontal (line) alignment as shown on the Drawings from any point between the shafts.

Grade Tolerance: maximum of 1% from the design vertical (grade) alignment as shown on the Drawings from any point between the shafts

3-7. GROUNDWATER CONTROL. Control of groundwater shall be in accordance with the requirements of the Trenching and Backfilling section.

3-8. VENTILATION. Contractor shall provide adequate ventilation complying with all relevant OSHA regulations, and shall design the ventilating system to include such factors as the volume required to furnish fresh air and the volume to remove dust and vapor that may impact the laser guidance system. The ventilation system shall be designed considering all internal combustion equipment that may be used in and near the shaft. When personnel entry is required, gas testing shall be carried out in accordance with OSHA requirements.

All work areas, including shaft access, ladders, and Jack & Bore operation activities (above and below the surface), shall be lighted to ensure proper workspace safety and visibility complying with all relevant OSHA regulations. The lights shall be on a separate circuit from other equipment.

Underground spaces, whether completed or under construction, shall be kept clear of water, slurry, lubricant, hydraulic oil, and excavated material to the extent practical, and shall comply with all relevant OSHA regulations.

3-9. CARRIER PIPE INSTALLATION. The carrier pipe shall be installed within the casing pipe by Contractor in the presence of Engineer. Installation shall be in accordance with the Ductile Iron Pipe section and in accordance with the recommendations of the pipe manufacturer.

End of Section

Section 02260

ENVIRONMENTAL PROTECTION

PART 1 - GENERAL

1-1. SCOPE. This section provides guidelines pertaining to protection of the environment during the construction of this project. The intent is to reduce soil erosion, sedimentation, air pollution, water pollution, and noise to the lowest reasonably achievable level.

1-2. GENERAL.

1-2.01. Erosion and Sedimentation Control. The Contractor shall be solely responsible for controlling erosion and sedimentation and preventing damage to public and private property caused by erosion. Contractor shall prevent erosion of soil on the site and adjacent property resulting from his construction activities. Effective erosion control measures shall be initiated prior to the commencement of clearing, grading, excavation, or other operations that will disturb the natural protection.

Work shall be scheduled to expose areas subject to erosion for the shortest possible time, and natural vegetation preserved to the greatest extent practicable. Temporary storage and construction buildings shall be located, and construction traffic routed, to minimize erosion.

Prior to the commencement of clearing, grading, excavation, or other operations that will disturb the natural protection, Contractor shall submit his plans for controlling erosion and sedimentation to the Engineer in writing for record purposes. Engineer's review of Contractor's erosion control plan will be solely to determine that Contractor does plan to control erosion and sedimentation.

Engineer's review of Contractor's erosion control plan shall not relieve Contractor of his responsibilities to control erosion and sedimentation, and Contractor's responsibilities to prevent damage to public and private property caused by erosion.

In addition, the Contractor may be required to provide additional erosion control at the site as directed by the Engineer, Owner, or county or state regulatory agency. Costs for additional erosion control shall be considered a subsidiary obligation of Contractor and all costs in connection therewith shall be included in the lump sum bid.

Stabilization measures shall be initiated as soon as practicable in portions of the site where construction activities have temporarily or permanently ceased, but in no case more than 14 days after the construction activity in that portion of the site has temporarily or permanently ceased, unless activity in that portion of the site will resume within 21 days.

Erosion control will be a condition for recommendation of progress payment applications.

PART 2 – PRODUCTS Not used.

### PART 3 - EXECUTION

#### 3-1. AIR POLLUTION.

3-1.01. Open Burning. Open burning of materials resulting from any land clearing associated with this project or any discarded construction materials or by-products is strictly prohibited.

3-1.02. Dust Control. The Contractor shall control dust throughout their contract period within the project area and at all other areas affected by the construction. This includes, but is not specifically limited to, paved and unpaved roads, haul roads, access roads, disposal sites, borrow pits, and material and equipment storage sites. Dust control measures may include, but are not limited to, wetting down disturbed earth surfaces or eliminating traffic across them, removing accumulations of dirt from paved areas by hand or mechanical means, and washing streets at the end of the work day. Such dust control measures shall be taken when required by the Engineer or the controlling agency for streets and roadways. Contractor shall provide protection for existing equipment, especially air handling equipment, in order to prevent damage due to dust. Protection measures may include, but are not limited to wrapping equipment, cleaning equipment, and replacing filters as necessary.

3-2. NOISE CONTROL. The Contractor shall keep the noise level on this project to the lowest level that is reasonably achievable through the use of proper mufflers on motorized equipment and through conduct of operations in a manner that minimizes noise.

3-3. WATER POLLUTION. The Contractor shall exercise every reasonable precaution throughout the life of the project to prevent pollution of rivers, streams, and water impoundments. Pollutants such as chemicals, fuels, lubricants, bitumens, concretes, grouts, raw sewage, or any other harmful waste shall not be discharged into or alongside of any watercourse, impoundment, or channel.

### 3-4. EROSION AND SEDIMENTATION CONTROL.

3-4.01. General. The project is subject to periodic inspection during construction by the North Carolina Division of Environmental Management.

The Drawings may not show all required erosion control measures. The Contractor shall be required to add to the erosion control measures as required.

3-4.02. Construction, Maintenance, and Removal. The Contractor shall construct and maintain all erosion control measures as indicated on the Drawings and be responsible for removal after Substantial Completion. The Contractor shall inspect erosion control devices at least once every 7 calendar days and within 24 hours (weekends and holidays included) after any storm event greater than 0.5-inches of rain per 24-hour period and shall clean or otherwise remove silt build-up as necessary to maintain them in proper working order.

Temporary erosion control structures shall be removed after protected areas have been stabilized.

3-4.03. Noncompliance. Failure of the Contractor to comply with any of the preceding requirements may result in the Contractor receiving formal notification by the state to initiate such measures. If compliance is not forthcoming within 48 hours of receipt of notification, the Owner may suspend all or portions of the work pursuant to the North Carolina Sedimentation Pollution Control Act of 1983 (GS 113A-54).

3-4.04. Methods. Details for erosion control practices to be used for this project are shown on the Drawings, conforming to the North Carolina Department of Environment and Natural Resources Erosion and Sediment Control Planning and Design Manual. Specifications for these practices follow.

3-4.05. Construction Entrances. A temporary gravel area or pad shall be constructed at all points where vehicles enter and leave a construction site. The Contractor shall clear the entrance and exit area of all vegetation, roots, and other objectionable material and properly grade and place gravel to the grade and dimensions shown on the plans. Provide drainage to carry water to a sediment trap or other suitable outlet. Use geotextile fabrics where noted to improve stability of foundation in locations subject to seepage or high water table.

Maintain the gravel pad in a condition to prevent mud or sediment from leaving the construction site. This may require periodic topdressing with 2-inch stone. Immediately remove all objectionable materials spilled, washed, or tracked onto public roadways.

3-4.06. Diversion Ditches. Not used.

3-4.07. Block and Gravel Inlet Protection. A temporary sediment control barrier shall be formed around storm drain inlets using standard concrete block and gravel as shown on the Drawings. This method of inlet protection applies to both standard drop inlets and catch basins.

Remove sediment as necessary to provide adequate storage volume for subsequent rains. When the contributing drainage area has been adequately stabilized, remove all materials and any unstable soil. Bring disturbed area to proper grade. Appropriately stabilize all bare areas around the inlet.

3-4.08. Half-Ring Inlet Protection. A temporary sediment control barrier shall be formed around culverts that exist in drainage ways along the length of the Project. This method of inlet protection consists of riprap and washed stone to create a semi-circle around the inlet of the culvert, as shown on the Drawings, to prevent sediment from entering the culvert and consequently, into the adjacent stream.

Remove sediment as necessary to provide adequate storage volume for subsequent rains. When the contributing drainage area has been adequately stabilized, remove all materials and any unstable soil. Bring disturbed area to proper grade. Appropriately stabilize all bare areas around the inlet.

3-4.09. Silt Fence. Temporary sediment barriers constructed of filter fabric, buried at the bottom, stretched and supported by posts shall be installed below small disturbed areas as shown on the Drawings to retain sediment by reducing the flow velocity of sheet flows to allow sediment deposition. Silt fencing shall be placed at the extreme limits of the disturbed area as shown on the Drawings.

Posts shall be the self-fastener angle steel type, 5 feet in length. Filter fabric shall be burlap or synthetic. Wire mesh shall be at least 10 gauge with a minimum of 6 line wires with 12-inch stay spacings. If silt fencing is used more than 45 days, synthetic type shall be used. Burlap shall be 7.5 oz. weight and a minimum 32 inches wide. Synthetic fabric shall be "Mirafi 100X" as manufactured by Celanese Fibers Co., "Bidim C34" as manufactured by DuPont Co., or equivalent.

Sediment fence shall be inspected at least once a week and after each rain. Sediment deposits shall be removed prior to reaching one-third height of the fence. Remove all fencing materials and stabilize area after contributing drainage area has been properly stabilized.

3-4.10. Stone Check Dams. Small temporary stone dams constructed across drainage ways which drain 2 acres or less shall be constructed as shown on the Drawings to restrict flow velocity and minimize erosion in small channels.

Stone shall be placed on a synthetic filter fabric foundation as shown on the Drawings. Fabric properties shall conform to properties listed for Silt Fence synthetic filter fabric.

Check dams and channels shall be inspected for drainage after each runoff event. Any damage shall be immediately corrected, and the sediment accumulated behind the dam shall be removed. Stone shall be added to dams as needed to maintain dimensions shown on the Drawings.

3-4.11. Sediment Traps. Not used.

3-4.12. Outlet Stabilization. Not used.

3-4.13. Temporary Seeding. Rapid growing annual grasses, small grains or legumes shall be planted as a temporary cover for erosion control on disturbed areas that will remain unstabilized for a period of more than 30 days. This practice applies to cleared areas, diversions, dams, temporary sediment basins, temporary road banks, and topsoil stockpiles where vegetation is needed for less than 1 year.

The soil shall be prepared in accordance with Section 02930, Seeding and Sodding.

Temporary seed shall be applied as follows:

	<u>Temporary Seeding - Piedmont, NC</u>		
	<u>Jan 1 – May 1</u>	<u>May 1 - Aug 15</u>	<u>Aug 15 - Dec 30</u>
Lime, tons/acre	1	1	1
Fertilizer (10-10-10), pounds/acre	750	750	1,000
Seed Mixture, pounds/acre			
Rye (Grain)	120	-	120
Annual Kobe	50	-	-
German Millet	-	40	-
Mulch (Straw), tons/acre	2	2	2

3-4.14. Erosion Control Matting and Straw Blankets. Unless otherwise specified herein or noted on the Drawings, jute and excelsior matting shall be placed where indicated on Drawings or otherwise required by Engineer to aid in stabilizing disturbed areas. Jute or excelsior matting for erosion control shall not

be dyed, bleached, or otherwise treated in a manner that will result in toxicity to vegetation.

Jute matting shall be of a uniform open plain weave of single jute yarn, 48 inches in width, plus or minus 1-inch. The yarn shall be of a loosely twisted construction and shall not vary in thickness by more than one-half its normal diameter. There shall be 78 warp ends, plus or minus 2, per width of the matting; 41 weft ends, plus or minus 1, per linear yard; and the weight shall average 1.22 pounds per linear yard of the matting with a tolerance of plus or minus 5 percent.

Excelsior matting shall be wood excelsior, 48 inches in width plus or minus 1-inch, shall have a minimum thickness of 1/4-inch, and the weight shall average 1.07 pounds per linear yard of the matting with a tolerance of plus or minus 5 percent. The excelsior matting shall be covered on one side with a woven fabric consisting of either twisted paper cord or cotton cord having a minimum mesh size of 1-inch by 1-inch, and a maximum mesh size of 1-1/2-inch by 3-inch.

Matting shall be placed immediately following seeding. The earth surface shall be smooth and free from stones, clods, or debris which will prevent the contact of the matting with the soil. Matting shall be installed in accordance with the details indicated on the Drawings and in accordance with the manufacturer's recommendations.

3-4.15. Borrow Areas. Borrow and/or spoil areas at the project site used by the Contractor (and approved by the Engineer) shall be subject to all erosion control requirements contained herein and to periodic inspection. If a borrow and/or spoil area is used, the Contractor must prepare and submit an erosion sediment control plan, meeting state requirements, to the Engineer 45 days in advance of land disturbing activities. Excavated soils either at the site or at borrow areas will be piled in such a manner and sufficient precautions taken to prevent their eroding or otherwise washing at any time, including nights, holidays, weekends, etc.

3-5. BIORETENTION FACILITIES. Not used.

3-6. TREE AND PLANT PROTECTION. All trees and plants not removed shall be protected against injury from construction operations. Contractor shall take extra measure to protect trees designated to be preserved, such as erecting barricades, trimming to prevent damage from construction equipment, and installing pipe and other work by means of hand excavation or tunneling methods. Such trees shall not be endangered by stockpiling excavated material or storing equipment against the trunk.

When the injury or removal of trees designated to be preserved cannot be avoided, or when removal and replacement is indicated on the Drawings, each



tree injured beyond repair or removed shall be replaced with a similar tree of the nearest size possible.

All trimming, repair, and replacement of trees and plants shall be performed by qualified nurserymen or horticulturists.

End of Section



Section 02309

GEOTECHNICAL INSTRUMENTATION

PART 1 - GENERAL

1-1. SCOPE. This Section specifies the requirements for furnishing, installing, and monitoring instrumentation devices to monitor ground (settlement and heave), structure, and utility movement, or deformation; maintenance of instruments; and removal of instrumentation upon completion of construction in the locations noted on the Contract Drawings. Surface Monitoring Points are shown on the Contract Drawings for the CSX Railroad right of way crossing and the crossing of US Route 74.

This Section also provides the threshold and limiting values of allowable ground movements (settlement and heave), structure movements, horizontal displacement, and groundwater impacts.

1-2. RELATED SECTIONS. The work of the following Sections is related to the work of this Section. Other sections not referenced below may be related to the proper performance of this work.

Section 02231, Jack & Bore  
Section 02340, Contractor Designed Ground Support Systems

1-3. PERFORMANCE REQUIREMENTS.

- a. Work shall include furnishing all labor, equipment, and materials for installing, protecting, monitoring, maintaining, analyzing, reporting, and removing instrumentation required to monitor surface and subsurface conditions during construction.
- b. Contractor shall protect and maintain instrumentation at no additional cost to Owner until approval is received from the Engineer for removal of such instrumentation. Instrumentation damaged during construction shall be replaced by the Contractor at no additional cost to Owner.
- c. Instrumentation readings, data collection, analyses, record keeping, and preparation of summary reports shall be performed by the Contractor. The work shall also include overall analysis of monitoring data collected so that if any abnormal movement, excessive ground settlement, or damage is observed, immediate steps shall be taken by the Contractor to stop the causes of such movements or settlements and prevent any further movement or settlement. In such instances, the Contractor shall prepare and execute a corrective program within 24 hours of identification of the problem, at no additional cost to the Owner. Remedial measures may

require modifications of the Contractor's construction procedures. The Engineer may collect, check, and/or analyze the instrumentation monitoring data at any time during construction for quality assurance purposes.

- d. Work related to this Section shall also include development and submission of a detailed monitoring plan containing information called for in this Section.
- e. Contractor shall install instruments and take initial readings for all specified instruments a minimum of fourteen (14) calendar days before the start of near surface conveyance excavation or any dewatering.
- f. Installation shall be completed so that at least three (3) complete sets of measurements or readings can be collected from the instruments as shown on the Contract Drawings before the start of excavation or any ground improvement or dewatering. The initial readings on each instrument shall be taken a minimum of 24 hours apart.
- g. The Contractor shall be responsible for procuring, furnishing, installing, and monitoring instrumentation reading devices for the various monitoring systems. Readings shall be provided to the Engineer within 24 hours of performing the readings for use in quality assurance monitoring.
- h. The Contractor shall provide access to work at all times to allow the Engineer to make measurements and conduct separate quality assurance monitoring to confirm the Contractor's measurements.
- i. Instrumentation installation locations and details shown on the Contract Drawings and as required herein may vary to conform to existing field conditions as per direction of the Engineer.

1-4. SUBMITTALS. The following information shall be submitted in accordance with the Submittals section.

- a. Contractor shall submit the following thirty (30) days prior to installation of instrumentation:
  - (1) Detailed instrumentation monitoring plan with schedule and procedures for installation, protection, monitoring, maintenance, and removal.
  - (2) Instrumentation manufacturer's shop Drawings, product descriptions, operating manuals, specifications, installation

procedures, calibration timeframe, calibration instructions, and calibration certificates for each type of instrument.

- (3) Manufacturer's certificate of compliance with specified standards.
  - (4) Detailed plan of instrument locations.
  - (5) Equipment and procedures to be used for pavement breaking and removal and surface repairs as required.
  - (6) Qualifications of individual(s) responsible for overseeing the monitoring program and surveying.
  - (7) Samples of daily reporting forms and example plots or graphs for each type of instrument.
- b. The Contractor shall supply daily reports of the work monitored and provide them to the Engineer. The daily reports, including monitoring data, shall be submitted to the Engineer within twenty four (24) hours after the observations have been made. The Contractor shall immediately report to the Engineer any ground movement or settlement observed. The report shall include as a minimum:
- (1) Electronic copies of monitoring data compatible with Microsoft Excel, clearly indicating instrument identification numbers and locations, date and time of all previous and current readings, reference elevations and depths for readings, weather conditions at time of readings, name of Owner and Engineer, project name, project number, contract number, and all other pertinent information or other information as required by the Engineer.
  - (2) Electronic copies of, at a minimum, cumulative plots of ground movement, deformation, and water levels. The data shall be presented in a graphical format showing vertical installation, the initial observation, previous observations, and the current observation. The report shall clearly identify the data collected during the current monitoring period. Data from each instrument shall be presented on its own graph.
- c. Contingency Plan: At least 30 calendar days prior to the start of construction, the Contractor shall submit a Contingency Plan that defines the remedial measures to be implemented to stabilize the excavation if any geotechnical instrumentation readings exceed the respective threshold values or limiting values for movement stated herein.

The Contingency Plan is not to restrict the Contractor from using the best construction methods available to meet the conditions, but is required to demonstrate a reasonable preparedness to mitigate the effects of possible excessive ground movement or settlement. The Contractor shall have all manpower, equipment, materials, and other items identified in the Contingency Plan available at all times while excavations are open or any ground improvement or dewatering operations are being performed. As a minimum, the Contingency Plan shall include:

- (1) Name and qualifications of personnel responsible for implementing the Contingency Plan.
- (2) Description of conditions considered to require remedial measures in order to protect adjacent structures, utilities, property, roads, and railroad tracks and to stop the observed ground movement or settlement observed.
- (3) List of stand-by manpower and equipment and their purpose for implementation of remedial measures and their availability.
- (4) List of stand-by materials or other items to be used and their purpose for implementation of remedial measures and their immediate availability.
- (5) Methods of verification of the successful implementation of remedial measures.

1-5. QUALITY ASSURANCE.

- a. The installation, calibration, data collection, and analysis of results from the instrumentation systems shall be performed by qualified individuals with a minimum of three (3) years of previous experience with the devices or systems specified herein. An instrumentation specialist shall be assigned by the Contractor for overall responsibility and oversight of the work.
- b. Contractor shall meet the following tolerances:
  - (1) Establish the initial elevations of the monitoring points to the nearest one hundredth (0.01) of a foot.
  - (2) Record of subsequent elevations of monitoring points to the nearest one hundredth (0.01) of a foot.

- (3) Record groundwater level elevations of piezometers to the nearest one hundredth (0.01) of a foot.
- c. Contractor shall install and operate the instrument systems in strict conformance with the manufacturer's requirements or as specified herein.
- d. Contractor shall provide instrumentation systems at all times during the monitoring program that meet the manufacturer's minimum calibration requirements. Instruments shall be recalibrated in accordance with the manufacturer's recommendations. In case of instrument failure, Contractor shall replace those instruments within 24 hours of detection at no additional cost to the Owner.

#### 1-6. AVAILABILITY OF DATA.

- a. All data collection, instrument readings, and monitoring survey data shall be performed by the Contractor. This information shall be furnished to the Engineer per the schedule requirements as defined herein.
- b. Data reports and all other unprocessed data, readings, and observations shall not be disclosed to third parties outside the Contract without the express written permission of the Engineer and the Owner.
- c. In the event of noted abnormal monitoring data or evidence of damage to existing facilities, the Contractor may be directed by the Engineer to increase the frequency of data collection and/or to install and monitor additional instrumentation at no additional cost to the Owner.

#### 1-7. DEFINITIONS.

- a. Initial Instrumentation Monitoring. Initial instrumentation monitoring is the initial reading of the installed instruments and shall include determination of actual installation locations and elevations for all instrument monitoring points and survey benchmarks.
- b. Limiting Values. Established limits of ground movement or settlement which if exceeded require the Contractor to cease construction operations and implement the submitted Contingency Plan until it is shown that mitigation efforts are successful.
- c. Monitoring Points. Monitoring points include surface monitoring points, structure settlement monitoring points, utility monitoring points, and survey benchmarks. All monitoring points shall be monitored by optical survey methods to determine vertical and/or horizontal displacements occurring

during construction.

- d. Piezometers. Piezometers are installed within boreholes and are screened to monitor ground water levels.
- e. Structure Settlement Monitoring Points. SSMPs are fixed markers placed on structures.
- f. Surface Monitoring Points. SMPs are fixed markers placed on or near the ground surface.
- g. Survey Control. Survey control is defined as a system of precise field measurements of the types and kinds specified herein, utilizing suitable methods and equipment, and utilizing qualified personnel for determination of elevations, coordinates, and distances for performing construction operations and geotechnical instrumentation monitoring. Survey control shall be performed by a professional land surveyor licensed in the State of North Carolina.
- h. Threshold Values. Established limits of ground movement or settlement which if exceeded require the Contractor to implement the submitted Contingency Plan and to initiate mitigating measures.
- i. Utility Monitoring Points. UMPs are fixed markers attached to existing utilities.

## PART 2 - PRODUCTS

2-1. SURFACE MONITORING POINTS (SMPs). SMPs in paved and unpaved areas shall be constructed of a one (1) inch diameter steel rod installed to a depth of five (5) feet. The upper end of the pipe shall be saw-cut flat and perpendicular to the pipe axis. The top of the rod shall be installed flush with the ground surface, especially in paved areas. The top of the pipe may also be installed above the ground surface in locations as directed by the Engineer to allow for monitoring to be performed at a distance. The top of the pipe shall be topped with a one (1) inch diameter stainless steel ball or reflective survey target. The Contractor shall install SMPs at the locations shown on the Contract Drawings prior to beginning excavation, or any ground improvement or dewatering activities.

2-2. STRUCTURE SETTLEMENT MONITORING POINTS (SSMPs). Not Used.

2-3. UTILITY MONITORING POINTS (UMPs). Not Used.



## PART 3 - EXECUTION

### 3-1. GENERAL.

- a. Contractor shall install instrumentation in accordance with the instrument manufacturer's recommendations and as shown on the Contract Drawings unless otherwise directed by Engineer. The Contractor may install and monitor additional instrumentation as desired by the Contractor, but installation and monitoring of such shall be performed at no additional cost to the Owner. Locations of additional instrumentation installed by the Contractor shall be acceptable to the Engineer. The Contractor shall also install instrumentation, especially piezometers, in accordance with the requirements of the North Carolina Department of Environment and Natural Resources and the North Carolina Administrative Code Title 15A.
- b. The location of instruments shown on the Contract Drawings is approximate. Exact locations of new instrumentation shall be determined in the field and shall be acceptable to the Engineer prior to installation of such instruments by the Contractor. To the extent possible, instruments shall be installed at locations out of the way of traffic and to avoid interference or disturbance by construction activities.
- c. Any ground improvement or dewatering, shall not be performed until all instrumentation as required by the Engineer is in place, stable, and an initial set of readings have been obtained and reviewed by the Engineer.
- d. Each instrument shall be permanently marked with a unique identification number. The Contractor shall utilize the unique identification numbers shown on the Contract Drawings for such instruments.
- e. Contractor shall be responsible for obtaining all utility clearances for all above ground and underground utilities, including private utilities, in the area of the proposed instrumentation locations by contacting the North Carolina 811 at 1-800-632-4949, 811, or through [www.nc811.org](http://www.nc811.org) before installation of such instruments. The Contractor shall relocate instruments as necessary to satisfy utility clearance requirements. The Contractor shall obtain the Engineer's acceptance of any relocation greater than three (3) feet in any direction prior to installing such instruments.
- f. Contractor shall be responsible for the maintenance of all existing and new geotechnical instrumentation during construction. Instrumentation shall be stored on-site in a weather-proof, heated, and ventilated space where possible. The Contractor shall provide access to the Engineer and Owner to all geotechnical instrumentation equipment at all times upon request.

- g. Contractor shall maintain existing piezometers as shown on the Contract Drawings until construction is complete or until piezometer is removed to facilitate construction. The Contractor shall obtain authorization from the Engineer prior to removal of any existing piezometers.
- h. The Contractor shall be responsible for supplying all necessary power for all monitoring equipment.
- i. Access, installation, monitoring, maintenance, and removal of instruments located within the CSX Railroad right of way shall be coordinated with CSX by the Contractor. The Contractor shall obtain railroad protective services, including railroad flagging, as required by CSX to perform work required herein on CSX Railroad right of way.

### 3-2. INSTALLATION AND MONITORING.

3-2.02. Surface Monitoring Points. SMPs shall be installed at the locations shown and as indicated on the Contract Drawings by the Contractor. The Contractor shall install temporary survey benchmarks as required to perform monitoring of the SMPs. SMP locations and associated survey benchmarks shall be identified by high visibility paint or with a colored disc survey marker.

Monitoring of SMPs shall be the responsibility of the Contractor and shall be performed under direction of a Professional Land Surveyor licensed in the State of North Carolina and by qualified Contractor personnel.

3-2.03. Structure Settlement Monitoring Points. Not Used.

3-2.04. Utility Monitoring Points. Not Used.

3-2.05. Piezometers. Piezometer enclosures installed by the Contractor shall be painted with high visibility paint and piezometers shall be protected as directed by the Engineer.

Monitoring of piezometers shall be the responsibility of the Contractor and measurements shall be performed by qualified Contractor personnel.

### 3-3. PROTECTION AND MAINTENANCE.

- a. All protective instrument access covers and enclosures shall be lockable and keyed alike, including existing piezometer enclosures. The Contractor shall provide two (2) keys to the Engineer after installation of instruments.

- b. Contractor shall protect and maintain all instruments and shall keep the protective covers locked. Maintenance may include draining or flushing the terminal boxes.
- c. Contractor shall repair or replace damaged or missing instrument components or entire instruments as required within 24 hours of detection of such damaged or missing components or entire instruments.
- d. Damaged or missing instrument components or instruments shall be repaired or replaced by the Contractor at no additional cost to the Owner unless otherwise directed by the Engineer.

3-4. MONITORING SCHEDULE AND LIMITS. The Contractor shall monitor all geotechnical instruments and shall report to the Engineer as described below:

- a. Initial Monitoring: Initial instrumentation monitoring for all instruments shown on the Contract Drawings or as otherwise listed herein shall be performed and recorded between 48 and 96 hours after installation of each instrument. Installation of instruments shall be completed so that at least three (3) complete sets of measurements or readings can be collected from the instruments two (2) weeks prior to the start of any excavation and any ground improvement or dewatering. The initial measurements or readings on each instrument shall be taken a minimum of 24 hours apart. Initial measurements or readings except for piezometers shall be taken until a minimum of three (3) separate elevation determinations agree to within two hundredths (0.02) of a foot are made for each location. Groundwater levels in piezometers shall be measured prior to the start of any excavation or any ground improvement or dewatering activities. Care shall be taken to ensure groundwater is at equilibrium in the piezometers prior to measuring.
- b. Other Excavation or Construction Adjacent to Railroad Tracks: piezometers, SMPs, SSMPs, and UMPs within 100 feet of any other excavation or construction operations occurring within 100 feet of the railroad right of way shall be monitored a minimum of once daily until such excavations are backfilled and compacted or construction operations are completed.
- c. At all other times piezometers, SMPs, SSMPs, and UMPs, shall be monitored a minimum of once per month until the warranty period expires or the Engineer directs the removal of such instruments, whichever occurs first.
- d. Piezometers, SMPs, SSMPs, and UMPs shall be monitored at more frequent intervals when directed by the Engineer, at no additional cost to

the Owner.

- e. Readings from all instruments and monitoring points shall be submitted to the Engineer within 24 hours of collecting data as required herein.
- f. The Engineer shall occasionally conduct quality assurance measurements of instruments. Measurements by the Engineer shall take precedence over the Contractor's measurements. However, the Contractor shall rely on the Contractor's own instrument readings for construction purposes.
- g. All monitoring points shall be referenced to fixed points which are a minimum of two hundred (200) feet away from all excavations to assure that the monitoring points provide accurate measurements.
- h. All elevation measurements shall be recorded to the nearest one hundredth (0.01) of a foot. All elevations shall be referred from the North American Vertical Datum of 1988 (NAVD 88) and shall be tied to the benchmarks indicated on the Contract Drawings.

3-4.01. Access. Contractor shall provide access to the Owner and Engineer to observe and for measuring the instruments at all times.

3-4.02. Instrument Threshold Values and Limiting Values. The Contractor shall limit the effects of construction to those specified in the following table.

<u>Instrument Type</u>	<u>Threshold Value</u>	<u>Limiting Value</u>
SMPs	0.25 inches	0.50 inches
SSMPs	0.25 inches	0.50 inches
UMPs	0.25 inches	0.50 inches

- a. Ground movement or settlement due to excavation operations shall be limited as required herein. The Contractor shall utilize whatever means as necessary to limit ground movement or settlement, including underpinning, compaction grouting, and consolidation grouting. Ground movement and settlement shall be measured at locations shown on the Contract Drawings and as required herein.
- b. If a Threshold Value is reached, the Contractor shall meet with the Engineer to discuss the need for response action(s) within twenty four (24) hours of reaching a threshold value.
  - (1) If directed by the Engineer that response action(s) are needed, the Contractor shall submit a detailed specific plan of action to the

Engineer's within twenty four (24) hours of Engineer's request, based on the Contingency Plan as required herein.

- (2) If directed by the Engineer, the Contractor shall implement such response action(s) within twenty four (24) hours of receiving direction by the Engineer.
  - (3) Contractor shall install and monitor additional instruments if directed by the Engineer at no additional cost to the Owner.
  - (4) Contractor shall increase the frequency of readings of instruments if directed to do so by the Engineer or as deemed necessary by the Contractor at no additional cost to the Owner.
- c. If a Limiting Value is reached or exceeded, the Contractor shall immediately take the following actions:
- (1) Cease all related construction operations.
  - (2) Develop a listing of corrective actions to be taken and submit to the Engineer for review, based on the Contingency Plan as required herein.
  - (3) Implement corrective actions.
  - (4) Resume related operations.
  - (5) Verify success of corrective actions.
  - (6) If corrective actions are not successful, cease all related operations and repeat process listed above.
- d. If settlement unacceptably damages pavement, structures, or other facilities, the repair or replacement of such pavement, structure, or other facility shall be as required and directed by the Engineer and the Owner of such pavement, structure, or other facility. The repair or replacement of pavement, structures, or other facilities shall be performed by the Contractor and shall be performed at no additional cost to the Owner.
- e. If utility settlement unacceptably degrades utility function, the repair or replacement of such utility shall be as required as directed by the Engineer and the utility Owner. The utility repair or replacement shall be performed by the Contractor and shall be performed at no additional cost to the Owner.



for the abandonment of such piezometers. Any surface completions, including protective bollards, shall be removed and the area surrounding removed instruments shall be restored to undisturbed conditions by the Contractor. Contractor shall also repair or patch any pavement that is disturbed or damaged by the Work required herein.

End of Section





Section 02330

TUNNEL ANNULAR BACKFILLING

PART 1 - GENERAL

1-1. SCOPE. This Section specifies requirements for placement of Low Density Cellular Concrete (LDCC) as backfill material in the annular space between the fiberglass reinforced polymer mortar carrier pipe and the steel casing pipe.

1-2. RELATED SECTIONS. The work of the following sections is related to the work of this Section. Other sections not referenced below may be related to the proper performance of this work.

Section 02231, Jack & Bore  
Section 03340, Low Density Cellular Concrete

1-3. QUALITY ASSURANCE.

1-3.01. Referenced Standards. Refer to Section 03340 Low Density Cellular Concrete.

1-3.02. Qualifications. Refer to Section 03340 Low Density Cellular Concrete.

1-3.03. Acceptance Criteria. Refer to Section 03340 Low Density Cellular Concrete.

1-4. SYSTEM DESCRIPTION.

1-4.01. Tolerances. Minimum annular clearance shall be 4 inches between the inside diameter of the casing pipe and the outside diameter of the carrier pipe.

1-5. SUBMITTALS. The following information shall be submitted in accordance with the Submittals Section.

1-5.01. Working Drawings and Method Statements.

- a. Method statements and design calculations for placing backfill materials, including initial lift heights of backfill, rate of placement based upon maximum height of backfill allowed prior to set to prevent overloading of the pipe.
- b. Details for transporting and placing backfill. Integrate with and describe the sequencing of this work with the installation of

carrier pipe as specified  
in Section 02231, Jack & Bore. Augment section with:

- (1) Lift drawings showing details of delivery pipes, slicklines, injection ports, bulkheads, vent outlets, and other materials.
  - (2) Calculations for preventing flotation and deformation of the carrier pipe. Provide calculation for each lift planned to place backfill.
  - (3) Description of labor, equipment and supplies required to perform the work.
  - (4) Cross-sections and profiles showing the arrangement of transportation, handling, and placing equipment including passing clearances.
  - (5) Details of pumping pressures and rates, placement sequences and volumes, lift thicknesses, including theoretical quantity for each placement.
  - (6) Methods for diverting construction water and groundwater and protecting the backfill.
  - (7) Methods of handling the backfill materials prior to placing the backfill within the annulus, including agitators, remixer etc.
- c. Methods of controlling lift heights or rate of placement of backfill within the requirements stated herein.
- d. Methods for maintaining uniformity of the backfill elevation around the carrier pipe.
- e. Method statements and design calculations for contact grouting including grouting pressure and volume of grout placed.

1-5.02. Mix Design Report. Refer to Section 03340, Low Density Cellular Concrete.

## 1-6. DEFINITIONS.

1-6.01. Low Density Cellular Concrete (LDCC). See Section 03340, Low Density Cellular Concrete.

1-6.02. Annular Space. The space between the casing pipe and the carrier pipe.

1-6.03. Annular Backfilling. The injection of LDCC to fill the annular space between the casing pipe and carrier pipe.

## PART 2 - PRODUCTS

### 2-1. MATERIALS.

2-1.01. Low Density Cellular Concrete. Shall be in accordance with Section 03340, Low Density Cellular Concrete.

### 2-2. MIX DESIGN.

2-2.01. Low Density Cellular Concrete. Mix design for LDCC shall be in accordance with Section 03340, Low Density Cellular Concrete.

### 2-3. EQUIPMENT.

2-3.01. General. Contractor shall provide all necessary equipment to manufacture, deliver, convey and place the backfill.

Contractor shall use equipment for mixing and injecting backfill which is designed for underground backfill grouting service. Contractor shall maintain equipment in good operating condition, capable of satisfactorily mixing, agitating, and forcing backfill into injection ports at a uniform flow rate under the required constant pressure.

Backfill grouting equipment shall be configured so flushing can be accomplished with grout intake valves closed, with water supply valve open, and with grout pump running at full speed.

Contractor shall operate all pumping equipment so that a continuous stream of backfill, without voids comprised of either air or water, is conveyed.

Contractor shall use a pressure gauge with no more than 0.5 percent error over the full range. The range of the pressure gauge shall not be more than 100 percent greater than the design injection pressure.

An adequate inventory of spare parts or backup equipment shall be provided to ensure that operable backfill grouting equipment is available at all times during the work.

Maintain sufficient quantities of spare pressure gauges, stop valves, and other wear parts on site.

2-3.02. Injection Hoses, Pipes and Connections. Contractor shall use hoses or pipes of proper type and diameter to withstand maximum injection pressures used.

At the point of injection, suitable valves and calibrated pressure gauges shall be provided so that the pressure and grout flow at the grout port may be regulated and monitored. Provide at or very near the point of injection, a system of valves in the line transporting the grout that will allow easy access for collection of test specimens.

Provide an automatic bypass valve set to the maximum pressure specified.

Injecting connections shall vary with the construction methods proposed by the Contractor.

Contractor shall provide suitable stop valves at the injection point for use in maintaining pressure, as required, until grout has set.

2-4. SOURCE QUALITY CONTROL. Contractor shall provide delivery and measurement of materials from batching equipment to within the accuracies specified in ASTM C94. Test scales periodically in a manner and at intervals set forth in the approved Quality Control Plan.

Contractor shall provide mix design tickets for backfill used each day, identifying the mix design criteria.

Contractor shall provide delivery tickets for each load of backfill in accordance with ASTM C94.

### PART 3 - EXECUTION

3-1. GENERAL. The Engineer shall be informed at least 24 hours in advance of the times and place where placement of annular backfill material is anticipated.

Contractor shall arrange and route utilities to provide ready and available services during annular backfill placement.

3-1.01. Grout Placement. Grout placement shall be completed using slicklines in the annular space. As an alternative pipe manufacturer shall install grout ports in crown of carrier pipe. Drilling of additional grout ports shall not be allowed by Contractor.

Grout ports shall be protected from becoming clogged or obstructed prior to grouting by means of a cap or other suitable device on the collar of the hole.

Any port that becomes blocked or otherwise unsuitable for its intended purpose shall be cleaned out in a satisfactory manner.

3-1.02. Backfill Agitation and Storage. Backfill in the mixer and holding tanks shall be continuously agitated. Backfill that is not injected into the hole within 2 hours after mixing shall be removed from the mixer, holding tank and supply line and shall be wasted.

Backfill shall be stored in accordance with manufacturer's recommendations. Backfill shall be maintained at temperatures above 50 degrees F until injected. The temperatures of mixing water shall range from 50 degrees F to 100 degrees F when added to the grout mixer. Backfill materials shall be stored at temperatures above freezing.

3-1.03. Bulkheads. Bulkheads shall be constructed at the end of each reach of pipe to be backfilled.

Bulkheads shall be constructed so the annular space will be completely backfilled.

Bulkheads shall incorporate a minimum 1-inch diameter drain pipe in the invert of the tunnel to facilitate drainage of water during backfilling. This pipe shall be securely capped and plugged once annular backfill material begins to flow from the drain line.

An opening shall be provided in the tunnel crown to allow entrapped air to escape. Vent outlets shall be provided as required.

3-2. EQUIPMENT. The Contractor shall select and operate backfilling equipment to avoid damage to new or existing underground utilities and structures.

In selection of backfilling placement Contractor shall consider pipe flotation, length of pipe, length of tunnel, depth from surface, type of carrier pipe, type of pipe blocking and bulkheading, vent outlets, backfill volume and length of pipe to be grouted between bulkheads.

Contractor shall operate any dewatering systems until the backfilling operations are complete.

Contractor shall verify that locations where backfill is to be placed are clean and free of standing or running water.

Batch and mix backfill in equipment of sufficient size and capacity to provide the necessary quality and quantity of backfill for each

placement stage.

Use equipment for backfilling of a type and size generally used for the work, capable of mixing grout to a homogeneous consistency, and providing means of accurately measuring backfill component quantities and accurately measuring pumping pressures. Use pressure equipment which delivers backfill to the injection point at a steady pressure.

### 3-3. PLACEMENT.

3-3.01. General Requirements. All void space outside of the carrier pipe shall be completely filled with annular backfill material. Backfill material shall be forced into all irregularities around the carrier pipe to completely fill the annulus with LDCC. Backfill material shall be placed in accordance with approved submittals.

Methods for completely filling the annular space between carrier pipe and the casing shall be acceptable to the Engineer. No standing water shall be allowed where backfill is to be placed.

Backfill shall be placed through the manufacturer installed grout ports in the pipe or through slicklines installed in the crown of the tunnel.

3-3.02. Placement Limits. The limits of each backfill placement stage shall be predetermined by the size and capacity of the batching equipment and the initial set time of the proposed backfill. Under no circumstance shall placement continue at an injection point longer than that period of time for the mix to take initial set. A stage of lift cannot be installed on another lift until a proper set has been attained. Have placement procedures approved by the admixture or additive manufacturer.

- a. Pressure gauges of appropriate range for monitoring the backfill injection pressures shall be located in the line transporting the backfill as close to the point of injection as possible.
- b. Contractor shall limit pressure on the annular space to prevent damage or distortion to the carrier pipe or initial support. Contractor shall define the limiting and estimated required pressure range and provide an open ended, high point tap or equivalent vent and monitor it at the bulkhead opposite to the point of backfilling.
- c. Contractor shall establish the limits of each backfill placement based on size and capacity of batching and placing equipment and mix parameters such as initial set time.

- d. Contractor shall pump backfill until a material discharge is similar in consistency to that at point of injection.
- e. Contractor shall not remove bracing and supports for carrier pipe until backfill has achieved initial set as determined by ASTM C403.
- f. Volume of backfill injected shall be calculated on an indirect basis and compared with the anticipated volume per foot of pipe backfilled.

3-3.02. LDCC Testing. Shall be in accordance with Section 03340, Low Density Cellular Concrete.

3-4. PROTECTION, PATCHING AND CLEANUP. The Contractor shall take all necessary precautions to protect and preserve the interior of the carrier pipe from damage. Spills shall be minimized and shall be cleaned up immediately. Any damage to the carrier pipe caused by or occurring during the backfilling operations shall be repaired by a method approved by the Engineer, at no additional cost to the Owner.

During backfilling work, provide for adequate disposal of all waste and wastewater. Remove and properly dispose of all waste resulting from backfilling operations.

Upon completion of the backfill operations, the Contractor shall remove all formwork, bulkheads, or other material used to contain the backfill and all grout supply connections from embedded pipe. Prior to final acceptance of the work, the interior surface of the final lining shall be cleaned of excess cement or grout, mortar, oil, and grease to the greatest extent practicable, as determined by the Engineer.

3-5. LIMITATIONS ON BACKFILL PLACEMENT. Annular backfill grouting of the carrier pipe shall be staged from the areas as indicated on the Drawings only. Staging from any other location shall be prohibited unless approved by the Engineer.

3-6. TUNNEL WORKING CONDITIONS. All backfill grouting shall be completed in accordance with the requirements of 29 CFR Part 1926, Subpart S, Underground Construction.

End of Section





Section 02340

CONTRACTOR DESIGNED GROUND SUPPORT SYSTEMS

PART 1 - GENERAL

1-1. DESCRIPTION. This Section includes the requirements for the design and installation of Contractor Designed Ground Support Systems for the microtunnel excavations and any other excavations greater than four (4) feet in depth.

1-2. RELATED SECTIONS. The work of the following Sections is related to the work of this Section. Other Sections, not referenced below, may also be related to the proper performance of this work. It is the Contractor's responsibility to perform all Work required by the Contract Documents.

Section 02202, Trenching and Backfilling  
Section 02231, Jack & Bore

1-3. REFERENCED STANDARDS. This Section incorporates by reference the latest revision of the following documents. These references are considered a part of this Section as specified. In case of conflict between the requirements of this Section and those of a listed document, the requirements of this Section shall prevail.

- a. American Society of Civil Engineers ASCE 36-15 Standard Construction Guidelines for Microtunneling.

1-4. QUALITY ASSURANCE. Perform all work required herein in the presence of the Engineer, unless the Engineer has granted prior approval to perform such work in his absence.

All shaft and tunnel excavations and any other excavations greater than four (4) feet in depth shall be performed in accordance with applicable Federal, State, and local laws, regulations, and ordinances.

1-4.01. Qualifications. All shaft and tunnel excavations and any other excavations greater than four (4) feet in depth, and the associated ground support systems thereof, shall be designed by a professional civil, geotechnical, or structural engineer licensed in the State of North Carolina, who is experienced in the design of ground support systems for similar applications.

1-5. SUBMITTALS. Submittals shall be made in accordance with the Submittals section. The following shall be submitted.

- a. Qualifications of engineer as required herein.
- b. Ground Support System Designs, including plans, calculations, and drawings, which shall be prepared, signed, and sealed by a professional civil, geotechnical, or structural engineer licensed in the State of North Carolina.
- c. Record Documents for any elements of the ground support system not removed at completion of construction.
- d. Ground Support System Design Certificate (02340.F1). The Contractor shall be responsible for ensuring that a separate design certificate shall be submitted for each structure and/or location where a ground support system design is to be implemented. Each design certificate shall be signed and sealed by the professional engineer that designed the ground support system.

1-6. PERMITS. Contractor shall be responsible for obtaining all building permits for the ground support system as required by the local jurisdictional authority.

1-7. DESIGN OF CONTRACTOR DESIGNED GROUND SUPPORT SYSTEMS.

The Contractor shall be solely responsible for the design of the Contractor Designed Ground Support Systems. The design shall be performed by a professional civil, geotechnical, or structural engineer licensed in the State of North Carolina, who is experienced in the design of ground support systems for similar applications.

The design of the ground support systems shall provide for, at a minimum, ground loads, groundwater pressures, surcharge loads, construction loads, and uplift. The design of the ground support systems shall also meet the requirements of the Contract Documents.

1-7.01. Design Lateral Pressures. The design lateral pressures shall be considered as minimum design load. The Contractor shall review the boring logs and verify that they are adequate for defining the expected ground conditions and are appropriate for the type of ground support system proposed and for the means and methods of construction. If additional information is needed, the Contractor shall be responsible for the coordination, collection and costs associated with any additional investigation. The Minimum Design Lateral Pressure for ground support systems shall be calculated as described below:

- a. Minimum Design Lateral Pressure = Minimum Lateral Earth Pressure + Minimum Hydrostatic Pressure + Minimum Surcharge Pressure + Compaction Effects Pressure:

$$(1) \quad \text{Minimum Lateral Earth Pressure} = K_o \times \gamma \times Z, \text{ where:}$$

- a)  $K_o$  = Coefficient of lateral earth pressure at rest = 0.3 to 1.0, depending on the rigidity of the support and the ground conditions.
  - b)  $\gamma$  = Unit weight of soil
  - c)  $Z$  = Depth.
  - d) Groundwater per the geotechnical borings.
- (2) Minimum Hydrostatic Pressure =  $\gamma_w \times Z$ , where:
- a)  $\gamma_w$  = Unit weight of water = approximately 62.4 pcf.
  - b)  $Z$  = Depth.
  - a) Groundwater per the geotechnical borings.
- (3) Minimum Surcharge Pressure =  $K_0 \times S$ : (AD6-1)
- a)  $K_o$  = Coefficient of lateral earth pressure at rest = 0.3 to 1.0, depending on the rigidity of the support and the ground conditions.
  - b)  $S$  = An assumed uniform pressure of 800 pounds per square feet (psf) acting at the ground surface. The uniform pressure of 800 psf is the minimum surcharge pressure based on an assumed traffic surcharge. The Contractor shall use the actual heaviest equipment load anticipated to calculate the minimum surcharge pressure, if the traffic surcharge is greater than the assumed traffic surcharge.
- (4) Compaction Effects Pressure =  $C$ , where:
- a)  $C$  = A uniform pressure of 500 psf shall be assumed for compaction-induced pressures.
- b. For cylindrical structures, the Minimum Design Lateral Pressure shall be applied radially to compute ring load.
- c. Distortion stresses are to be superimposed, as required.

1-7.02. System Requirements. Ground support systems shall maintain the safety of personnel, prevent damage to adjacent structures, facilities, utilities, and property, and maintain the inherent strength and stability of the ground surrounding the excavation. Contractor Designed Ground Support Systems shall prevent ground loading on the proposed Work until after the concrete design strength has been reached.

1-7.03. Design Considerations. Design of the ground support system shall consider at a minimum:

- a. Ground conditions and lateral earth pressure indicated herein.
- b. Methods for control of groundwater and surface water.
- c. Stiffness and water tightness of the ground support system.
- d. Deformation, as well as stability, of the ground support system under load.
- e. Proximity of existing underground and above-ground structures, facilities, utilities, and properties.
- f. Effects on adjacent structures of vibration from mechanical equipment.
- g. Method and rate of advance of excavation.
- h. All loading conditions, including loading due to delay in adding support members, removal of support members, and dynamic loading.
- i. Placement of permanent lining and installation of structures.
- j. Uplift.

1-7.04. Design Details. Ground support system design submittal shall include the following details:

- a. Design loading conditions.
- b. Member sizes and thicknesses, and strength properties of materials to be used.
- c. Codes and reference standards used as a basis for design.
- d. Correctly dimensioned layout of support system including location of members (such as beams, columns, piles, walers, struts, sheeting and other supports).

- e. Connection details.
- f. Sequence of installation and/or erection.
- g. Maximum allowable spacing between bracing points on compression members to maintain stability and alignment.
- h. Requirements or limits on pre-loading braces.
- i. Location, dimensions, and means of ensuring stability at openings.
- j. Description of method of installation for ground support system elements installed in advance of the excavation, and method of correcting ground support system defects exposed by subsequent excavation.
- k. Description of quality control methods for ground support system elements cast in place in advance of the excavation.
- l. Design of steel members in accordance with the American Institute of Steel Construction (AISC), Steel Construction Manual. Overstress of members shall not be allowed.
- m. Copies of all design assumptions and calculations for the Engineer's information.
- n. Monitoring system to monitor movement, settlement, or deformation of the ground support system or surrounding ground.

## PART 2 - PRODUCTS (NOT USED)

## PART 3 - EXECUTION

### 3-1. GENERAL.

- a. Construct ground support systems to the line, grade, dimensions, and tolerances shown on the Contractor's design drawings.
- b. Install and remove elements of ground support systems following the sequence of operations shown on the Contractor's design drawings.

- c. Develop and maintain firm and uniform bearing of the ground support system against the ground, such as by expanding the ground support system tightly against the ground, or by filling the void space between a non-expanding ground support system and the ground by contact grouting.
- d. Periodically examine and monitor the ground support systems to identify any loosening or unstable ground or loss of ground through the ground support system and excessive deformation, overstress, or weakening of the ground support system.
- e. Promptly reset, repair, or replace elements of the ground support system that settle, become misaligned, were improperly installed, or become damaged during construction.

### 3-2. REMOVAL OF CONTRACTOR DESIGNED GROUND SUPPORT SYSTEMS.

- a. The Contractor shall repair any settlement or damage to the Work or adjacent structures, facilities, utilities, or property resulting from removal of ground support systems.
- b. Ground support systems that extend below the bottom of the excavation shall not be removed without prior approval of the Engineer.
- c. Ground support systems that cannot be removed without causing damage shall be left in place, at no additional cost to the Owner.
- d. Ground support systems shall be removed to a depth of at least four (4) feet below ground surface, so as not to interfere with future development, unless otherwise approved by the Engineer.

End of Section

Section 02340.F1

CONTRACTOR DESIGNED GROUND SUPPORT SYSTEMS

GROUND SUPPORT SYSTEM DESIGN CERTIFICATE

I, the undersigned professional engineer licensed in the State of North Carolina, where the ground support system is located, hereby certify that the ground support system for the \_\_\_\_\_(structure name) excavation, located at \_\_\_\_\_(location) has been designed by me, is appropriate for the (structure name) and (location) as represented to me, and is in compliance with the Contract Documents.

Name: \_\_\_\_\_

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

Date: \_\_\_\_\_

State of Licensure: \_\_\_\_\_

License Number: \_\_\_\_\_

Seal: \_\_\_\_\_





Section 02512

ASPHALT PAVING

PART 1 - GENERAL

1-1. SCOPE. This section covers the furnishing of labor, materials and equipment for the construction of asphaltic concrete base or binding course, bituminous tack coat, and asphaltic concrete surface or wearing course for the roadway, driveways and parking area as indicated on the Drawings.

Asphaltic concrete paving shall be constructed to the lines, grades, and cross sections indicated on the Drawings. Type of construction shall be as indicated on the Drawings and as specified herein.

1-2. GENERAL.

1-2.01. Governing Standards. Except as otherwise specified or indicated, materials, equipment, details, and construction methods shall comply with the applicable North Carolina DOT "Standard Specifications for Roads and Structures" provisions.

1-2.02. Coordination. Contractor shall coordinate the construction of asphaltic concrete paving with the excavation, the construction of concrete curb and gutters and other construction.

1-3. SUBMITTALS. All submittals of design mix reports including design mix test results and other data, shall be in accordance with the Submittals Procedures section.

PART 2 - PRODUCTS

2-1. MATERIALS. The sources of materials shall be acceptable to Engineer. Except as modified herein, materials shall conform to the requirements of the governing standards. Delivery tickets for all materials delivered to the site shall be submitted to Engineer at the end of each day during the progress of the work.

Asphaltic concrete materials shall be as follows:

Asphalt Concrete  
Surface Course

Section 610 of the governing standards,  
Type SC 9.5B

Asphalt Concrete Intermediate Course	Section 610 of the governing standards, Type I 19.0C
Asphalt Concrete Base Course	Section 610 of the governing standards, Type B 25.0C.
Aggregate Base Course	Section 52D of the governing standards, Type A or B.
Bituminous Tack Coat	Section 605 of the governing standards.
Bituminous Prime Coat	Section 600 of the governing standards.
Expansion Joint Filler	ASTM D1751, bituminous-type, 1/2-inch thick.
Hot-poured Joint Sealing Compound	ASTM D1190.
Gravel Surfacing	Section 1005 of the governing standards, #57 or ABC (M) aggregate.

2-2. DESIGN MIXES. A design mix for the asphalt base course and for the surface course, based upon the aggregates to be furnished, shall be determined by an independent testing laboratory at the expense of Contractor and shall be submitted to Engineer for review.

The design mixes shall be based on the Marshall Test Method, and upon acceptance by Engineer, shall be the basis for the mixes to be used in asphaltic concrete pavement construction. The proposed design mix data submitted for review shall include at least the following:

- Marshall stability, all mixtures
- Density
- Number of compaction blows
- Flow, all mixtures

### PART 3 - EXECUTION

3-1. EQUIPMENT. Equipment and facilities for storage, measuring, mixing, heating, transporting, spreading, compacting, and other operations shall be in accordance with the applicable requirements of the governing standards.

Improved or modernized equipment which will produce results equal in quality to those which would result from the specified equipment will be considered for use. All equipment and facilities shall be acceptable to Engineer.

3-2. SUBGRADE PREPARATION. As a minimum, the top 6 inches of the subgrade shall be compacted to 100 percent of standard proctor density at optimum moisture content as determined by governing standards. In addition, the stability of subgrades shall be such that when materials for construction are deposited on the subgrade no rutting or displacement of the subgrade by material hauling vehicles will occur. No materials shall be placed on subgrades which are muddy, frozen, or have frost, snow, or water thereon. Subgrades shall be thoroughly compacted and properly shaped before any surfacing materials are placed. All subgrade and surfacing shall be sloped toward drains or outer edges.

3-3. PAVEMENTS. Whenever it is necessary to remove pavement to install a pipeline or other construction, the pavement shall be cut to true line by a method acceptable to Engineer and the pavement removed just prior to the trenching operation. Contractor will be allowed to excavate no more trench width than is necessary to install the pipe. The pavement shall be trimmed an additional 12 inches beyond the trench edge to give firm bearing for the patching operations.

Contractor shall backfill all trenches to a point below the existing pavement equal to a minimum of 13-inches based on final replacement of 11-inches of asphalt concrete base course and 2-inches of asphalt concrete surface course. In areas outside NCDOT AND City of Monroe roadways, the trench shall be backfilled with asphalt concrete base course to within two inches of the existing asphalt surface and allowed to settle. The asphalt concrete surface course shall then be applied and edges shall be feathered to match existing curb and gutter as required. All open cuts in NCDOT and City of Monroe roadways, shall be backfilled, paved and traversable prior to removing lane closure.

Finished surfaces shall conform to the lines and grades indicated on the Drawings and shall be milled to match existing surfaces. All new asphalt shall be feathered to provide a smooth transition to existing asphalt surfaces.

It shall be Contractor's responsibility to maintain all pavement cuts in good order until all repair work is completed.

Asphalt pavement repair shall be as indicated on the Drawings.

Minimum temperatures under which asphaltic concrete pavements may be constructed shall be as stipulated in the governing standards.

3-4. Repair of Damaged Asphalt Pavement. All existing pavement which

sustains damage due to construction activities shall be repaired by patching as follows.

The existing pavement shall be sawcut in a rectangular shape at least 12 inches beyond the damaged area in each direction. The existing asphalt concrete surface course and asphalt concrete binder course shall be removed and disposed of by Contractor. Pavement shall be repaired with new materials as specified. The final surface elevation of the patch shall be the same as the existing pavement.

3-5. Construction. Asphalt concrete pavements shall be constructed on previously prepared subgrades as specified. Construction shall be in accordance with the applicable sections of the governing standards.

Asphalt mixtures may be spread and finished by hand methods only where machine methods are impractical as determined by Engineer. Hand-placed mixtures shall not be cast or otherwise manipulated in such manner that segregation occurs.

3-6. Field Testing. Asphalt pavement surface and density acceptance testing will be performed in accordance with Section 610 of the governing standards at the expense of the Contractor. Cost of retesting required due to failure of test shall also be at the Contractor's expense.

3-7. GRAVEL SURFACING. Gravel surfacing shall be placed on a compacted subgrade as specified and shall be in accordance with Section 545 of the governing standards. Gravel shall be compacted to extent required to stay in place and support traffic.

Gravel surface repair shall be as indicated on the Drawings.

3-8. PROTECTION. In addition to the requirements for protection set forth in the governing standards, Contractor shall protect all adjacent concrete and masonry so that no damage will occur as the result of subsequent construction operations. All damage or discoloration shall be repaired to the satisfaction of Engineer before final acceptance by Owner.

Special care shall be taken to prevent asphaltic materials from spraying or splashing. Adjacent construction shall be protected by covering with suitable fabric or paper.

3-9. REPAIR OF DEFECTS. Contractor shall remove and replace defective areas by cutting to the full depth of the course. Cuts shall be made perpendicular and parallel to the direction of traffic with edges vertical.

A tack coat shall be applied to all exposed surfaces. The area shall be filled with fresh hot asphaltic concrete mix in lifts of the same depths as the adjacent area, then compacted by rolling to specified surface density and smoothness.

3-10. CLEANING. After completion of paving operation, all areas shall be cleaned of excess spilled asphalt materials to the satisfaction of Engineer.

End of Section



Section 02605

MANHOLES, FRAMES, AND COVERS

PART 1 - GENERAL

1-1. SCOPE. This section covers the furnishing and installation of standard and drop manholes. Standard and drop manholes shall be constructed complete with covers, steps, fittings, and other appurtenances, in accordance with the details in the figures at the end of this section.

Where required, special manholes shall be constructed in accordance with the details indicated on the Drawings.

Steps, frames, and covers for structures other than manholes are covered in other sections.

All manholes shall be heavy duty H-20 rated for traffic areas.

1-2. GENERAL. At the option of Contractor, standard manholes may be constructed with cast-in-place concrete bases or precast concrete (developed) bases as indicated on the figures.

1-3. SUBMITTALS. Drawings and data covering precast concrete sections and castings shall be submitted in accordance with the Submittals Procedures section.

When steel-reinforced plastic manhole steps are specified, data submitted shall include verification of the type and grade of steel used for step reinforcement, typical chemical analysis of the steel, type and classification of the plastic, and reports of acceptance tests performed in accordance with ASTM C478, Section 16, and C497, Section 10.

1-4. DELIVERY, STORAGE, AND HANDLING. Shipping shall be in accordance with the Product Delivery Requirements section. Handling and storage shall be in accordance with the Product Storage and Handling Requirements section.

Precast concrete sections shall not be delivered to the job until representative concrete control cylinders have attained a strength of at least 80 percent of the specified minimum.

Precast concrete sections shall be handled carefully and shall not be bumped or dropped. Hooks shall not be permitted to come in contact with joint surfaces.

PART 2 - PRODUCTS

2-1. MATERIALS.

Precast Concrete Manholes and Reinforcement	ASTM C478, except as modified herein.
Cement	Cement type shall comply with ASTM C150, Type II containing not more than 5 percent tricalcium aluminate. Water-cementitious materials ratio shall not exceed 0.40. Alternative materials proposed by Contractor that will provide equivalent corrosion protection and durability may be submitted subject to review and acceptance by Engineer.
Riser and Precast Base	Circular, uniform outside diameter.
Minimum Wall Thickness	1/12 of inside diameter, plus 1 inch.
Cone	Shape shall be flat as required; wall thickness as specified for riser sections.
Adjusting Rings	Circular, with shear keys.
Cast-in-Place Concrete Bases	Materials, handling, forms, finishing, curing, and other work as specified in the cast-in-place concrete section.
Nonshrinking Grout	Grace "Supreme", L&M "Crystex", Master Builders "Masterflow 713 Grout Plus" or "Set Grout", Sauereisen Cements "Grout No. F-100 Level Fill Grout", UPCO "Upcon Super Flow", or Five Star Products "Five Star Grout".
Mastic Fill	Butyl rubber compatible with resilient connector material.
Gaskets	
Mastic	ASTM C990; Hamilton-Kent "Kent-Seal No. 2", Sheller-Globe "Tac-Tite", or K. T. Snyder "Ram-Nek". Cross-sectional area as recommended by manhole manufacturer.
Rubber	ASTM C361, Section 6.9, except gasket shall be synthetic, with



	hardness of 40 ± 5 when measured by ASTM D2240, Type A durometer. Natural rubber will not be acceptable.
Rubber Joint Filler	Synthetic.
Hardness	40 ± 5 when measured by ASTM D2240, Type A durometer.
Tensile Strength	1,200 psi minimum.
Coal Tar Epoxy	High-build coal tar epoxy; Ameron "Amercoat 78HB Coal Tar Epoxy", Carboline "Bitumastic 300M", or Tnemec "46H-413 Hi-Build Tneme-Tar".
Castings	ASTM A48, Class 35B or better.
Manhole Rings and Covers	USF 668 and KL cover or equivalent, MIN 24" DIA, Ring and cover assembly shall not weigh less than 285 pounds.
Manhole Steps	
Steel-Reinforced Plastic Manhole Steps	H. Bowen "BOWCO No. 93813" or M.A. Industries "PS2-PF"; 1/2 inch deformed steel bar, ASTM A615, Grade 60 minimum, totally encapsulated in copolymer polypropylene, ASTM D4101.

2-2. MANUFACTURE. The first riser sections for use with cast-in-place bases shall be provided with horseshoe-shaped boxouts for connecting piping to be grouted in, or with circular openings with continuous, circular, resilient connectors cast into the riser wall. Boxouts for grouting, if used, shall have surfaces grooved or roughened to improve grout bond.

Precast sections may be provided with lifting notches on the inside faces of walls to facilitate handling. Lifting notches shall be not more than 3 inches deep; holes extending through the wall will not be acceptable.

2-3. INTERIOR CORROSION PROTECTION SYSTEM. Not used

### PART 3 - EXECUTION

3-1. INSPECTION. Precast concrete sections shall be inspected when delivered and all cracked or otherwise visibly defective units shall be rejected.

### 3-2. CONSTRUCTION.

3-2.01. Bases. If cast-in-place concrete bases are used, concrete shall be placed on undisturbed earth in accordance with applicable requirements of the Concrete section.

If precast concrete (developed) bases are used, the subgrade materials shall be excavated to undisturbed earth and to a uniform elevation which will permit at least 4 inches of granular embedment material to be installed and compacted. The surface of the granular material shall be carefully graded and the base section accurately set so that connecting pipes will be on proper line and grade. The elevation of the granular material shall be adjusted until proper grade and alignment of the base section has been attained.

No wedging or blocking under precast concrete bases will be permitted.

3-2.02. Riser and Cone Sections and Precast Concrete Adjusting Rings. Circular precast sections and rings shall be provided with a rubber or mastic gasket to seal joints between sections and rings. Mastic gaskets shall be used only at temperatures recommended by the manufacturer. Lifting notches in manhole walls shall be filled with nonshrinking grout.

Steel-reinforced plastic manhole steps shall be provided. Manhole steps shall be plant-installed and shall be driven into prepared holes or vibrated into green concrete, in accordance with the recommendations of the step manufacturer.

3-2.03. Connecting Piping. The space between connecting pipes and the wall of precast sections shall be completely filled with nonshrinking grout, except where resilient connectors are provided.

### 3-3. EXTERIOR COATING.

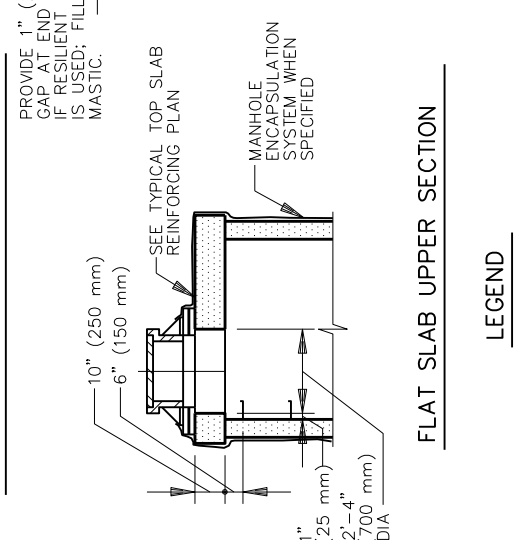
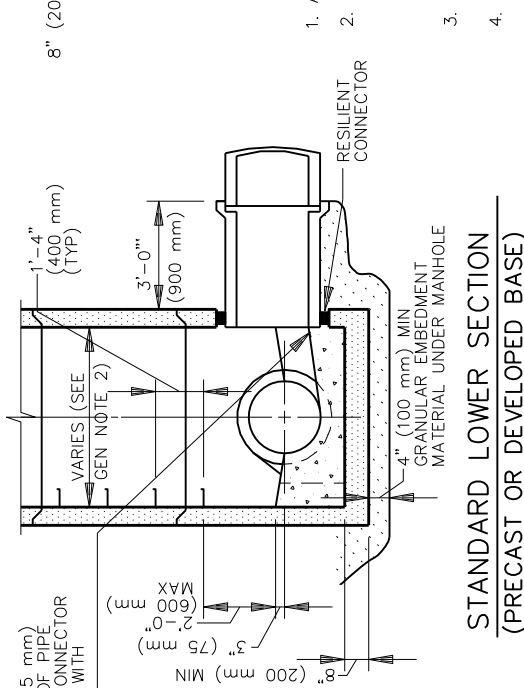
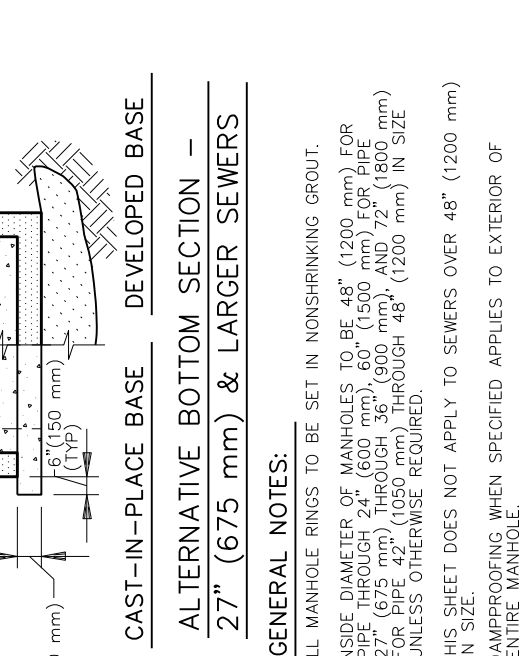
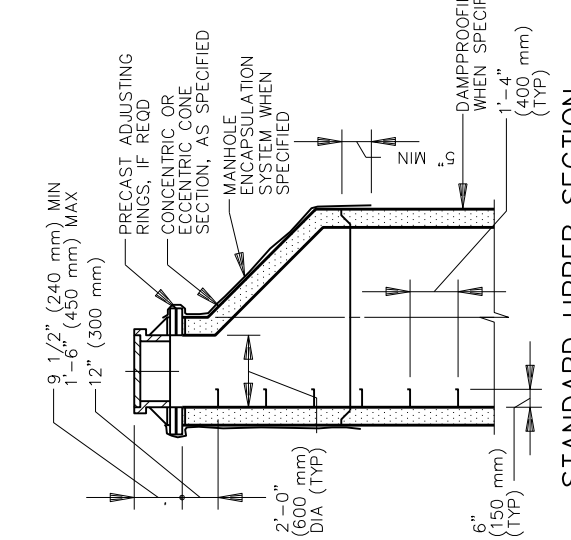
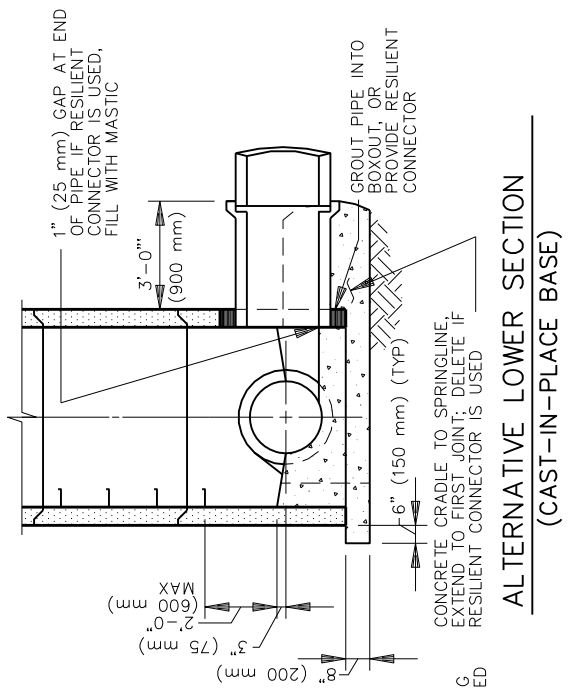
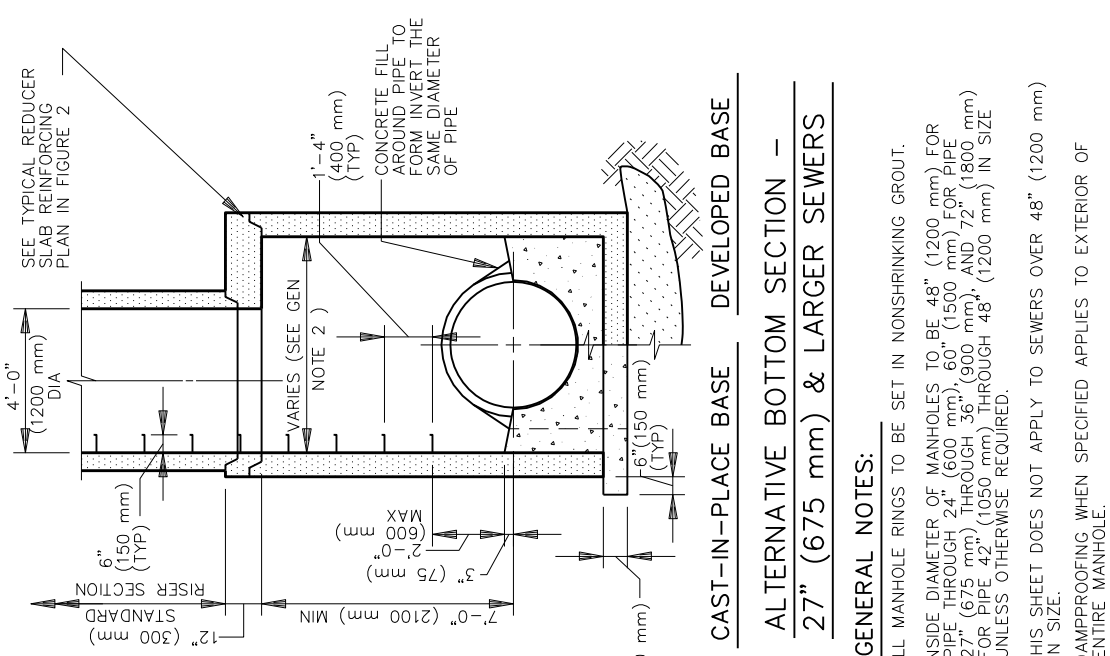
3-3.01. Damproofing. Not used.

3-3.02. Manhole Encapsulation System. Not used.

3-4. CASTING COATING. Not used.

3-5. STUBS. Not used

End of Section



**GENERAL NOTES:**

1. ALL MANHOLE RINGS TO BE SET IN NONSHRINKING GROUT.
2. INSIDE DIAMETER OF MANHOLES TO BE 48" (1200 mm) FOR PIPE THROUGH 24" (600 mm), 60" (1500 mm) FOR PIPE 27" (675 mm) THROUGH 36" (900 mm), AND 72" (1800 mm) FOR PIPE 42" (1050 mm) THROUGH 48" (1200 mm) IN SIZE UNLESS OTHERWISE REQUIRED.
3. THIS SHEET DOES NOT APPLY TO SEWERS OVER 48" (1200 mm) IN SIZE.
4. DAMPPROOFING WHEN SPECIFIED APPLIES TO EXTERIOR OF ENTIRE MANHOLE.

**LEGEND**

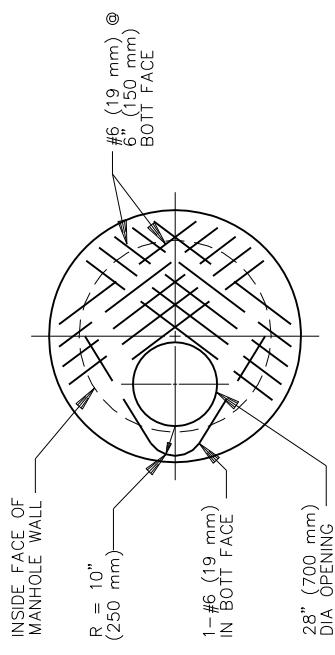
- PRECAST CONCRETE
- CONCRETE, CAST-IN-PLACE
- PIPE BEDDING MATERIAL
- UNDISTURBED EARTH

**FIG 1 - 02605**

**DETAILS OF STANDARD MANHOLES**

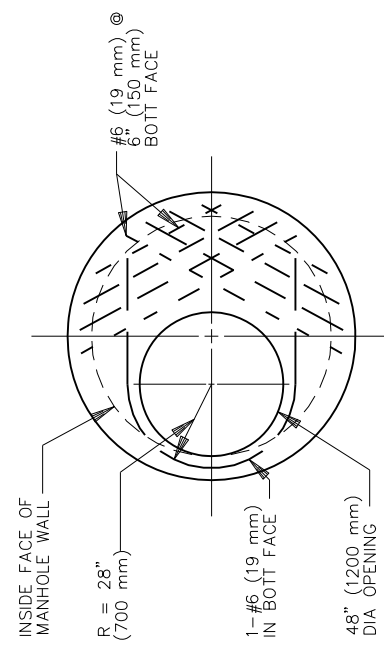
**WITH MANHOLE STEPS**





NOTE: TOP OF SLAB TO BE MARKED "TOP"

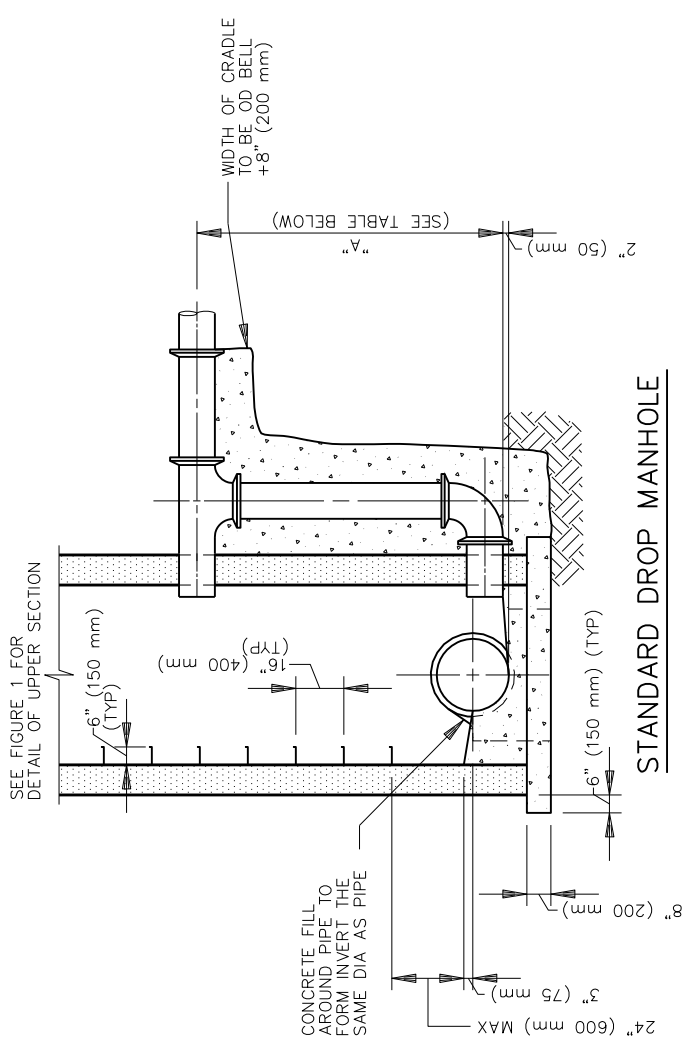
TYPICAL TOP SLAB REINFORCING PLAN



TYPICAL REDUCER SLAB REINFORCING PLAN

**LEGEND**

	PRECAST CONCRETE
	CONCRETE, CAST-IN-PLACE
	PIPE BEDDING MATERIAL
	UNDISTURBED EARTH



STANDARD DROP MANHOLE

ID INCOMING PIPE		ID DROP PIPE		"A" MINIMUM	
in.	mm	in.	mm	in.	mm
8	200	8	200	24	600
10	250	10	250	24	600
12	300	12	300	24	600
15	375	12	300	24	600
18	450	15	375	26	650
21	525	18	450	31	775
24	600	18	450	33	825
27	675	18	450	34	850
30	750	18	450	37	925
36	900	18	450	40	1000
42	1050	24	600	42	1050
48	1200	30	750	48	1200

DROP MANHOLE DIMENSIONS

DETAILS OF STANDARD MANHOLES

WITH MANHOLE STEPS

BLACK & VEATCH



Section 02675

CLEANING AND DISINFECTION OF WATER PIPELINES

PART 1 - GENERAL

1-1. SCOPE. This section covers cleaning of potable and non-potable water pipelines and disinfection of all potable water pipelines installed under this Contract.

Pipeline pressure and leakage testing is covered in the Pipeline Pressure and Leakage section.

1-2. GENERAL.

1-2.01. Coordination. Contractor shall coordinate cleaning and disinfection work with adjacent work as necessary to preclude work interferences or duplication of effort and to expedite the overall progress of the work.

Contractor shall provide all necessary piping, piping connections, temporary valves, backflow preventers, flowmeters, sampling taps, pumps, disinfectant, neutralization agents, chlorine residual test apparatus, and all other items of equipment or facilities necessary to complete the cleaning and disinfection work.

Water for cleaning and disinfection work will be provided as stipulated in the Temporary Facilities section.

In all cases where it is necessary to interrupt service, permission of Owner shall be obtained at least two days before the service will be interrupted. In all cases where it is necessary to interrupt service to water customers, permission of the Owner shall be obtained, and each customer affected shall be notified of the proposed service interruption and its possible duration in accordance with the Project Requirements section.

Unless otherwise specified, final cleaning and disinfection work shall not be performed until after hydrostatic testing of the pipelines and any resulting repair work completed.

Contractor shall notify the Owner prior to the work to allow their representatives to be present during cleaning and/or disinfection of the pipelines.

1-2.02. Related Work. Other sections directly related to work covered in this section are the Pipeline Pressure and Leakage Testing section and the Ductile Pipe section.

1-2.03. Governing Standard. All disinfection work shall conform to the requirements of ANSI/AWWA C651, and the requirements of the Owner and NC Public Water Supply except as modified herein. If any state or local requirements conflict with the provisions of this section, the state and local requirements shall govern.

Contractor shall notify federal, state, and local regulatory agencies to determine if any special procedures or permits are required for disposal of neutralized or diluted chlorinated water from the final flushing of pipelines and to identify acceptable locations for disposal of the flushing water. All requirements and costs associated with notification and obtaining any discharge permits shall be the responsibility of the Contractor.

1-2.04. Experience. The disinfection work shall be performed by a subcontractor specialized in such work, or with the permission of Engineer, Contractor may provide the necessary equipment and do the work with his own personnel. In either case, all work shall be done under the direct supervision of a competent and experienced specialist in such work.

Personnel performing the disinfection shall demonstrate a minimum of 5 years' experience in the chlorination and dechlorination of similar pipelines.

1-2.05 . Special Cleaning and Disinfection Requirements. Special cleaning and disinfections requirements include the following:

### 1-3. SUBMITTALS.

1-3.01. Cleaning and Disinfection Plan. Unless otherwise specified, Contractor shall submit a detailed cleaning and disinfection plan to Engineer 14 days prior to starting any cleaning and disinfection work. The plan shall cover the method and procedure proposed, necessary coordination, qualification of personnel performing the disinfection work, sequence of operations, the limits of the pipelines to be cleaned and disinfected, the positions of all valves, location of temporary bulkheads, materials and quantities of each to be used, equipment to be used, manner of filling and flushing the pipelines, chlorine injection points, sample points, bacteriological testing location and schedule, potable water source, method of metering the water if required, neutralization and disposal of wasted water, and all other methods and procedures to be followed in performing the cleaning and disinfection work.

1-3.02. Testing. Bacteriological testing shall be performed by a state approved independent testing laboratory per 15A NCAC 18C.1001 furnished by Contractor. Contractor shall submit the qualifications of the proposed state approved independent testing laboratory for Owner approval prior to performing the specified bacteriological tests. Upon completion of each test, three copies of the test results shall be submitted to Engineer.



Contractor shall provide all items of equipment, piping, and other facilities necessary to assist with the collection of the samples as required. Locations for bacteriological sampling shall be in accordance with the governing standards or as acceptable to the Owner.

The chlorine residual tests shall be performed by Contractor. The test logbook shall be made available to Owner or Engineer upon request and shall be submitted to Engineer upon completion of all chlorine residual testing.

#### 1-4. QUALITY ASSURANCE.

1-4.01. Chlorine Residual Tests. Contractor shall provide the necessary apparatus for making the chlorine residual tests by the drop dilution method in Appendix A of ANSI/AWWA C651. Test results shall be recorded in a logbook that includes for each test: the location, date, time, test results, and test kit manufacturer.

1-4.02. Bacteriological Tests. Sampling and testing of water in the pipelines shall be performed after final flushing in accordance with Section 5 of ANSI/AWWA C651. Obtain a minimum of two samples from each sampling site for total coliform analysis. The number of sites depends on the amount of new construction but must include all dead-end lines, be representative of the water in the newly constructed mains, and shall be collected a minimum of every 1,200 linear feet. Prior to sampling, the chlorine residual must be reduced to normal system residual levels or be non-detectable in those systems not chlorinating. These samples must be collected at least 24 hours apart and must show the water lines to be absent of total coliform bacteria. The chlorine residual must also be measured and reported. If the membrane filter method of analysis is used for the coliform analysis, non-coliform growth must also be reported. If the non-coliform growth is greater than 80 colonies per 100 millimeters, the sample result is invalid and must be repeated. All samples must be analyzed by a state approved independent testing laboratory.

1-4.03. Redisinfection. Should the bacteriological tests indicate the presence of coliform organisms at any sampling point, the pipelines shall be reflushed, resampled and retested in accordance with Section 5 of ANSI/AWWA C651. If check samples show the presence of coliform organisms, then the pipelines shall be rechlorinated until acceptable results are obtained.

## PART 2 - PRODUCTS

2-1. MATERIALS. All materials furnished by Contractor shall conform to the requirements of ANSI/AWWA C651 and shall be clean and free of debris which could infer questionable test results.

2-1.01. Liquid Chlorine. Liquid chlorine shall conform to AWWA B301.

2-1.02. Calcium Hypochlorite (Dry). Calcium hypochlorite shall conform to AWWA B300.

2-1.03. Sodium Hypochlorite (Solution). Sodium hypochlorite shall conform to AWWA B300.

2-1.04. Chlorine Residual Test Kit. Chlorine residual concentration shall be measured using an appropriate range, drop count titration kit or an orthotolidine indicator comparator with wide range color discs. The color disc range shall be selected to match chlorine concentration limits. Test kits shall be maintained in good working order and available for immediate test of residuals at point of sampling. Test kits manufactured by Hach Chemical or Orbeco-Hellige are acceptable.

### PART 3 - EXECUTION

#### 3-1. APPLICATION.

3-1.01. Cleaning. Pipelines, including all associated valves and fittings, shall be cleaned to the satisfaction of Owner and Engineer.

Small pipelines shall be cleaned by flushing with water at the maximum velocity which can be developed, but not less than 4 feet per second, unless otherwise permitted by Engineer. Flushing shall continue until the pipeline is free of dirt, debris, and other foreign materials. Cleaning shall precede disinfection.

Large pipelines may be flushed as specified for small pipelines, cleaned with a hose, or cleaned by other methods acceptable to Engineer. Flushing or other cleaning methods shall continue until the pipeline is free of dirt, debris, and other foreign materials. Cleaning shall precede disinfection.

Flushing shall be accomplished through the installed valves or fittings, blow-offs or through temporary flushing connections installed for that purpose and in accordance with any details indicated on the Drawings.

Booster pumps shall be used if needed to obtain the necessary volume or velocity of water. Pumping equipment installed under this Contract shall not be used for flushing, nor shall the flushing water be passed through them or other installed equipment; temporary bypass piping at each pump or installed equipment shall be provided as needed.

3-1.02. Disinfection Procedure. Disinfect new potable water lines and affected portions of existing potable water lines in accordance with AWWA C651. Apply

chlorine by the continuous feed method. Chlorinate water lines with not less than 25 milligrams per liter of available chlorine. Water from the existing distribution system or other sources of supply shall be controlled so as to flow slowly into the newly laid pipeline during the application of chlorine. The solution shall be retained in the pipelines for not less than 24 hours. Flush the solution from the systems with clean water until maximum residual chlorine content is not greater than 0.2 parts per million or residual chlorine content of domestic water supply.

Admission of disinfectant solution into or the flushing thereof through existing piping shall be held to the minimum possible, and then only after adequate measures have been taken to prevent any such solution of chlorinated wastewater from entering branch service connections to water customers or other piping systems.

During disinfection, all valves and hydrants shall be operated to ensure that all appurtenances are disinfected. Valves shall be operated such that the chlorine solution in the pipeline being chlorinated will not flow back into the supply line. Check valves shall be used if needed.

Existing pipelines which may become contaminated during work requiring connections to the new pipeline, involving either tapping or cutting into operations, shall be flushed and disinfected in accordance with Section 4 of ANSI/AWWA C651.

3-1.03. Final Flushing. Upon completion of chlorination, but before sampling and bacteriological testing, all heavily chlorinated water shall be removed from the lines by flushing with potable water until the chlorine residual in the lines is not higher than that generally prevailing in the adjacent existing system or as acceptable to the Owner.

Final flushing shall be accomplished as specified for cleaning of pipelines.

3-1.04. Disposal of Chlorinated Wastewater. All chlorinated wastewater to be discharged shall be neutralized by chemical treatment and disposed in accordance with Section 4 and Appendix C of ANSI/AWWA C651 and the requirements of the governing agency specified herein. Schedule, rates of flow, and locations of discharge of disinfection and flushing water shall be coordinated with Engineer and in accordance with all applicable rules and regulations.

End of Section





ground temperature and the air temperature within the pipe, precautions shall be taken to prevent or minimize further thermal deflections.

3-2. LAYING PIPE. Pipe shall be protected from lateral displacement by embedment material installed as specified in the Trenching and Backfilling section. Pipe shall not be laid in water or under unsuitable weather or trench conditions.

Pipe laying shall begin at the lowest elevation with bell ends facing the direction of laying, except when reverse laying is permitted by Engineer.

Foreign material shall be kept out of the pipe during installation. No debris, tools, clothing, or other foreign objects shall be placed in the pipe.

Whenever pipe laying is stopped, the open end of the pipe shall be closed with a tight-fitting end board to keep out soil. The end board shall have perforations to admit water and prevent flotation of the pipe in the event the trench becomes flooded.

3-3. JOINTING. All joint preparation and jointing procedures shall comply with the instructions and recommendations of the manufacturer.

3-3.01. Rubber Gasketed Joints. Rubber gaskets shall be positioned on the joint in accordance with the manufacturer's recommendations. Immediately before joints are pushed together, all joint surfaces shall be thoroughly cleaned and coated with the lubricant furnished with the pipe. The gasket shall be lubricated and positioned in the spigot groove so that the gasket is distributed uniformly around the pipe circumference. The position of the rubber gasket shall be checked with a feeler gauge after each joint is completed. If the gasket is not in the proper position, the joint shall be pulled apart, the gasket removed and discarded, and the joint re-assembled using a new, properly lubricated gasket.

Joint lubricant shall be stored in closed containers and shall be kept clean. When installing pipe in cold weather, the joint surfaces and gaskets shall be kept warm and the joint lubricant shall be protected from freezing.

3-3.02. Flexible Sealant Joints. Joints made with flexible joint sealant shall be coated with adhesive as directed by the sealant manufacturer, and the joint sealant shall be positioned in accordance with the manufacturer's installation instructions. The pipe sections forming the joint shall be pulled together with sufficient force to uniformly fill and seal the annular space in the joint. Joints shall not be made when adverse weather conditions may prevent proper sealing, nor when the temperature of the pipe and sealing materials is too low to achieve proper sealing.

3-3.03. Mastic Joints. Surfaces of pipe to be joined with mastic joints shall be primed, if recommended by the mastic manufacturer. Immediately before joining the pipes, a uniform layer of mastic shall be applied to the joint surfaces. After the pipes are in final position, the mastic shall completely fill and seal the annular space in the joint. Joints shall not be made when weather conditions may interfere with obtaining a satisfactory seal.

3-3.04. Field Cut Joints or Connections Between Dissimilar Pipe Materials. Where indicated on the Drawings or required to facilitate installation of field cut joints in PVC or composite sewer pipe, or connections between PVC or composite sewer pipe and pipe of other materials, a HYMAX coupling or approved equal may be used in accordance with the instructions of the coupling manufacturer and pipe manufacturer.

3-4. TEE BRANCHES. Not Used.

3-5. SERVICE CONNECTIONS. Service connections shall not be installed as vertical risers but shall be laid on a slope not to exceed 2 vertical to 1 horizontal. Each service connection pipe shall have a solid bearing on undisturbed earth.

3-6. CONCRETE ENCASEMENT. Not Used.

3-7. ACCEPTANCE TESTS. In areas where sections of the existing sewer main must be removed and replaced due regulatory separation requirements or for the installation of new water main, the new sewer shall be inspected by CCTV (extending from upstream manhole to downstream manhole) to demonstrate the new sewer section is free of defects and installed at a uniform grade. The video shall be provided to both Engineer and Owner within 1 week of the sewer repair. All defects shall be repaired to the satisfaction of Engineer and Owner and re-inspected using CCTV.

In areas where the reach of sewer to be replaced extends from manhole to manhole, each reach of sewer shall meet the requirements of the following acceptance tests. All defects shall be repaired to the satisfaction of Engineer and Owner.

3-7.01. Lamping. Unless otherwise indicated on the Drawings, each section of sewer line between manholes shall be straight and uniformly graded. Each section will be lamped by Contractor.

3-7.02. Exfiltration. An exfiltration test shall be conducted on each reach of sewer between manholes. The first line between manholes shall be tested before backfilling and before any additional sewer pipe is installed. Thereafter,

exfiltration testing shall be done after backfilling, and individual or multiple reaches may be tested at the option of Contractor.

Exfiltration tests shall be conducted by blocking off all manhole openings except those connecting with the reach being tested, filling the line, and measuring the water required to maintain a constant level in the manholes. Each manhole shall be subjected to at least one exfiltration test.

During the exfiltration test, the water depth above the pipe invert at the lower end shall be at least to the elevation of the ground surface, unless otherwise specified. The maximum depth of the water at the lower end shall not exceed 25 feet, and the minimum depth of the water at the upper end shall be at least 5 feet above the crown of the pipe or 5 feet above groundwater elevation, whichever is higher.

The total exfiltration shall not exceed 100 gallons per inch of nominal diameter per mile [9 liters per millimeter of nominal diameter per kilometer] of pipe per day for each reach tested. For purposes of determining maximum allowable leakage, nominal diameter and depth of manholes shall be included. The exfiltration tests shall be maintained on each reach for at least 2 hours and shall be longer if necessary, in the opinion of Engineer, to locate all leaks.

Contractor shall provide, at his own expense, all necessary piping between the reach to be tested and the source of water supply, and all labor, equipment, and materials required for the tests. The methods used and the time of conducting exfiltration tests shall be acceptable to Engineer.

3-7.03. Low Pressure Air Testing. With prior approval by Engineer, low pressure air testing may be used in lieu of exfiltration testing for 24 inch diameter and smaller pipe. Air testing shall not be used for manholes, or for pipe larger than 24 inches in diameter.

The schedule of testing shall be submitted to Engineer prior to starting the tests. The time of conducting the tests shall be acceptable to Engineer.

The time elapsed for a 1 psi drop in air pressure shall be not less than, nor shall the air loss exceed, the limits set forth in the governing standard.

If the length of sewer to be tested is fully or partially submerged in groundwater, the test pressure shall be increased if necessary, to overcome the actual static pressure exerted by the groundwater. If a test pressure greater than 8 psi results, air testing shall not be used, and exfiltration testing will be required.



Leaks shall be located by testing short sections of pipe. Leaks shall be repaired and the reach of sewer retested.

3-7.04. Infiltration. If, at any time prior to expiration of the correction period stipulated in the General Conditions, infiltration exceeds 100 gallons per inch of nominal diameter per mile of sewer per day, Contractor shall locate the leaks and make repairs as necessary to control the infiltration.

3-8. CLEANING. The interior of all pipe and fittings shall be thoroughly cleaned before installation and shall be kept clean until the work has been accepted. All joint contact surfaces shall be kept clean until the joint is completed.

End of Section



Section 02704

PIPELINE PRESSURE AND LEAKAGE TESTING

PART 1 - GENERAL

1-1. SCOPE. This section covers field hydrostatic pressure and leakage testing of piping. The term "piping" shall be used in this section to refer to piping systems, pipelines, or sections thereof.

Testing of other piping is covered in the Sewer Pipe Installation and Testing section and Miscellaneous Piping and Accessories Installation section. Cleaning and disinfection of piping is covered in the Cleaning and Disinfection of Water Pipelines section.

1-2. GENERAL. Contractor shall coordinate pressure and leakage testing with adjacent work as necessary to preclude work interferences or duplication of effort and to expedite the overall progress of the work.

Contractor shall provide all necessary piping, piping connections, temporary valves, backflow preventers, and all other items of equipment or facilities necessary to complete the pressure and leakage testing.

In all cases where it is necessary to interrupt service, permission of Owner shall be obtained at least two days before the service will be interrupted. In all cases where it is necessary to interrupt service to water customers, permission of the Owner shall be obtained and each customer affected shall be notified of the proposed service interruption and its possible duration in accordance with the Project Requirements section.

Contractor shall notify federal, state, and local regulatory agencies to determine if any special procedures or permits are required for disposal of water used for pressure and leakage testing and to identify acceptable locations for disposal of the water. All requirements and costs associated with notifications and obtaining any discharge permit or approvals shall be responsibility of Contractor.

Engineer or Engineer's representative shall be present during testing and shall be notified of the time and place of testing at least 3 days prior to commencement of testing. All testing shall be performed to the satisfaction of Engineer, and in accordance with all governing standards and regulations.

1-2.01. Testing Schedule and Procedure. A testing schedule and procedure shall be submitted to Engineer for review and acceptance not less than 21 days

prior to commencement of testing. The schedule and procedure shall include, but not be limited to the following information for each pipe section to be tested:

- limits of each pipe test section;
- proposed time and sequence;
- physical locations and set positions of all valves;
- locations of temporary bulkheads, stops, caps, restraints, supports, and other temporary equipment needed;
- manner of filling and source of water;
- method and location of metering volumes;
- method and location of gauging pressures; and
- method and location of disposal of test water.

1-2.02. Special Testing Requirements. Special testing requirements include the following:

Unless otherwise acceptable to Engineer, the general sequence of work for each pipeline, or valved or bulkheaded section thereof, shall be as follows:

- Initial cleaning and flushing of pipeline.
- Filling pipeline.
- Hydrostatic pressure and leakage testing.
- Disinfection.
- Final flushing and neutralization of heavily chlorinated water.
- Bacteriological tests.

Unless otherwise acceptable, during testing of the pipeline, all valves, except for auxiliary hydrant valve(s), shall be in the open position.

Unless otherwise acceptable, a temporary pressure gauge shall be installed at each end of the limits of the pipeline to be tested.

Unless otherwise acceptable, tests shall be conducted before connections are made to existing water lines, or to any portion of water lines installed under this Contract that have already been put into service.

Unless otherwise acceptable, upon completion of testing and disinfection, connections made to existing water lines or to any portion of water lines installed under this Contract that have already been put into service, and any other portion of the pipeline not subject to the pressure test, shall be visually inspected for leakage after placing the water line into service and before backfilling the connection.

If testing is permitted against a valve, the maximum differential test pressure across the valve seat (gate) in the closed position shall not exceed the drip-tight rated pressure of the valve.

1-2.03. Water. Water for testing shall be furnished as stipulated in the Temporary Facilities section. Following completion of testing, the water shall be disposed of in accordance with the requirements of regulatory agencies and in a manner acceptable to Engineer.

## PART 2 - PRODUCTS

2-1. TEST EQUIPMENT. All necessary connections between the piping to be tested and the water source, together with pumping equipment, water meter, pressure gauges, backflow prevention, and all other equipment, materials, and facilities required to perform the specified tests, shall be provided. All required blind flanges, valves, bulkheads, bracing, blocking, and other sectionalizing devices shall also be provided. All temporary sectionalizing devices shall be removed upon completion of testing. Vents shall be provided in test bulkheads where necessary to expel air from the piping to be tested.

Test pressure shall be applied by means of a force pump sized to produce and maintain the required pressure without interruption during the test.

Water meters and pressure gauges shall be accurately calibrated and shall be subject to review and acceptance by Engineer.

Permanent or temporary gauge connections shall be installed at each location where test gauges are connected to the piping during the required test. Drilling and tapping of pipe walls will not be permitted. Upon successful completion of testing, each permanent gauge connection shall be fitted with an isolation valve and a permanent gauge, and each temporary gauge connection, if used, shall be fitted with a permanent sealed plug or cap acceptable to the Engineer.

Permanent or temporary fill and vent connections shall be installed as needed for the required test. Drilling and tapping of pipe walls will not be permitted. Upon successful completion of testing, each permanent fill and vent connection shall be fitted with the permanent fill or vent piping, and each temporary fill and vent connection, if used, shall be fitted with a permanent sealed plug or cap acceptable to the Engineer.

## PART 3 - EXECUTION

3-1. FILLING AND VENTING. Before filling the piping with water, care shall be taken to ensure that all air release valves and other venting devices are properly installed and operating properly. Hand-operated vent valves shall not be closed until an uninterrupted stream of water is flowing from each valve. The rate of filling the piping with water must not exceed the venting capacity of the installed air vent valves and devices.

3-2. BLOCKING AND BACKFILLING. Piping shall be adequately blocked, anchored, and supported before the test pressure is applied. All piping may be tested after backfilling.

3-3. PRESSURE TESTING. After the piping to be tested has been filled with water, the test pressure shall be applied and maintained without interruption within plus or minus 5 psi of test pressure for 2 hours plus any additional time required for Engineer to examine all piping being tested and for Contractor to locate any defective joints and pipe materials. The test pressure shall be in accordance with the requirements specified for pipeline or plant piping.

3-3.01. Pipeline Test Pressure. Piping shall be subjected to a hydrostatic test pressure of 200 psi.

3-4. PIPELINE LEAKAGE TESTING. The pipeline piping shall be subjected to a leakage test. Leakage testing may be conducted concurrently with pressure testing. The duration of the leakage test shall be 2 hours plus the additional time required for Engineer to make an accurate determination of leakage.

3-4.01. Leakage Test Pressure. The hydrostatic pressure maintained during the leakage test shall be equal to the pressure specified for pressure testing of the piping and shall be maintained within plus or minus 5 psi during the entire time that leakage measurements are being performed.

3-4.02. Leakage Measurement. Measurement of leakage shall not be attempted until all trapped air has been vented, absorption of water by the pipe wall or lining has stabilized, and a constant test pressure has been established. After the pressure has stabilized, piping leakage shall be measured with a suitable water meter installed in the pressure piping on the discharge side of the force pump.

3-4.03. Allowable Leakage. The term "leakage", as used herein, refers to the total amount of makeup water which must be added into the piping during the test to maintain the test pressure.

No piping will be accepted if and while it exhibits a leakage rate in excess of that determined by the indicated formulas:

$Q = 0.00676 \text{ DLN}$  (using inch-pound units)

Where

Q = allowable leakage in gallons per hour

D = nominal diameter of pipe in inches

L = length of section tested in thousand feet

N = square root of the test pressure in pounds per square inch

Whenever the piping to be tested contains pipe of different diameters, the allowable leakage shall be calculated separately for each diameter and the corresponding length of piping. The resulting allowable leakage rates shall be added to obtain the total allowable leakage for the entire piping.

All joints in piping shall be free from visible leaks during the leakage test. Each leak which is discovered within the correction period stipulated in the General Conditions shall be repaired by and at the expense of Contractor regardless of the amount that the total leakage may have been below the specified allowable leakage rate during the leakage test.

If the leakage test indicates a higher than allowable leakage rate, Contractor shall locate and repair leaking joints and other defective work and repeat the test until leakage rate is less than the allowable rate.

End of Section





Section 02930

SEEDING AND SODDING

1. SCOPE. This section covers all materials, equipment, lawns, mulch, protection of improvements, maintenance, guarantee, coordination with other trades, and related items required to provide established grass-covered areas and as specified, including, but not limited to, the following:

Existing soil preparation and fertilizing.

Grassing, temporary and final seeding, and mulching.

Guarantee and maintenance during the guarantee periods.

1.01. Industry Standards. Some products and execution are specified in this section by reference to published specifications or standards of the following (with respective abbreviations used):

The American Society for Testing and Materials (ASTM).

Association of Official Agricultural Chemists (AOAC).

American Association of Nurserymen (AAN).

United States Department of Agriculture (USDA)

North Carolina Department of Agriculture (NCDA).

Areas to be seeded include all areas disturbed by construction operations, including grading, parking of equipment, designated waste area, trenching, or any other operation that has destroyed the existing vegetative cover.

1.02. Submittals.

1.02.01. Guarantees. A written guarantee shall be submitted (in duplicate) stating terms of guarantee, name of installer, name of Owner, and name of Project, location, and dates.

1.02.02. Maintenance Schedule. Prior to final acceptance, typewritten instructions outlining procedures to be established by the Owner for maintenance of landscape work during the guarantee period shall be submitted to the Owner and the Engineer. Contractor shall monitor landscape maintenance to ensure there is proper care of plant material.

2. MATERIALS.

2.01. Fertilizer. Fertilizer shall be commercial slow-release fertilizer delivered to the Site in unopened original containers each bearing the manufacturer's guaranteed analysis. Any fertilizer which becomes caked or otherwise damaged shall not be accepted. Slow-release fertilizer shall contain a 10-10-10 ratio of nitrogen, phosphate, and potash.

2.02. Lime. Lime shall be dolomitic limestone meeting NCDA requirements for agricultural limestone, ground such that not less than 90 percent passes a 10-mesh sieve and not less than 50 percent passes a 100-mesh sieve.

2.03. Water. Water, hose, and other watering equipment as required for the Work shall be furnished by the Contractor.

2.04. Topsoil. Topsoil shall be without admixture or subsoil and shall be clean and reasonably free from clay lumps, stone, stumps, roots, similar substances 2 inches or more in diameter, debris, or other objects which might be a hindrance to planting operations.

2.05. Soil for Repairs. The soil used in repair work shall be of a quality at least equal to that which exists in areas adjacent to the area to be repaired. Soil shall be used that is free from tree roots, clay balls, stones, and other materials that hinder grading, planting, and maintenance operations and that is free from noxious and other objectionable weed seeds and toxic substances.

2.06. Grass Seed. Grass seed shall be as follows:

Lawn Grass	5 pounds "Rebel II" fescue and 1.5 pounds "Kentucky Bluegrass" seeded at a rate of 6.5 pounds per 1,000 square feet.
Erosion Control and Temporary Seed	5 pounds K-31 Tall Fescue and 4 pounds Annual Rye seeded at a rate of 9 pounds per 1,000 square feet.

Seed shall be certified seed labeled in accordance with the U.S. Department of Agriculture Rules and Regulations under the Federal Seed Act and shall comply with the State Seed Laws of the State of North Carolina. Seed shall be furnished in sealed, standard containers unless written exception is granted.

Seed that is wet or moldy or that has been otherwise damaged in transit or storage will not be acceptable. The seed shall be free of field bindweed,

hedgeweed, and nutgrass seed. The seed shall not contain other noxious weed seed in excess of the limits allowable under the Federal Seed Act.

Samples of all seed used shall have been tested within 9 months prior to seeding by a legally authorized seed testing laboratory.

3. CONSTRUCTION.

3.01. Experience. Contractor shall employ only experienced personnel who are familiar with the required Work and shall provide adequate supervision by a qualified foreman.

3.02. Planting Schedule. Materials shall be planted or installed only during normal planting seasons for each type of landscape work required.

Temporary seed shall be planted for erosion control purposes on disturbed areas that will remain unstabilized for a period of time as follows:

<u>DESCRIPTION</u>	<u>STABILIZATION</u>	<u>TIMEFRAME EXCEPTIONS</u>
Perimeter dikes, swales, ditches, slopes	7 days	None
High Quality Water (HQW) Zones	7 days	None
Slopes steeper than 3:1	7 days	If slopes are 10' or less in length and are not steeper than 2:1, 14 days are allowed.
Slopes 3:1 or flatter	14 days	7 days for slopes greater than 50' in length.
All other areas with slopes flatter than 4:1	14 days	None, except for perimeters and HQW Zones.

Final seeding and fertilizing shall not be done during periods of severe drought, high winds, excessive moisture or frozen ground, or other conditions such that, as determined by the Engineer, satisfactory results are not likely to be obtained.

Fall seeding will be permitted between the dates of September 1 to October 15. Spring seeding will be permitted as soon as the ground can be worked to April 15. Summer seeding will not be permitted. If Contractor's schedule will not allow for this time schedule, then disturbed areas will be seeded with temporary seed until the proper time occurs. Extension of the seeding dates will be subject to acceptance by the Engineer.

3.03. Preparation of Areas to Be Grassed.

3.03.01. General. Preparation shall not start until after all other site and utilities work has been completed and approved by the Engineer within the areas to be seeded or planted.

3.03.02. Areas to Be Grassed. Soil shall be loosened thoroughly to a depth of 6 inches, until tillage is suitable for subsequent operations. The following additives shall be worked into the soil:

<u>Additive</u>	<u>Amount</u>
Lime	100 pounds per 1,000 square feet.
Slow-release Fertilizer	35 pounds per 1,000 square feet; Formula 10-10-10.
Superphosphates	1 pound per 1,000 square feet.

Lawn areas shall be graded to a smooth, even surface with a loose, uniformly fine texture and rolled and raked to remove ridges and fill depressions as required to meet finished grades. The surface shall be cleared of stumps, stones larger than 1 inch in diameter, roots, sticks, cable, wire, and other materials that might hinder the work or subsequent maintenance. Fine grading shall be limited to areas which can be planted promptly after preparation.

Soil amendments of the type specified shall be distributed uniformly over the entire site at the rate specified hereinafter, unless other recommendations are made by a soil testing laboratory. The soil amendments shall be applied prior to tilling. The areas to be seeded shall be thoroughly tilled to a depth of not less than 4 inches by discing, harrowing, or other acceptable methods until the soil is well pulverized and existing vegetation is destroyed.

3.04. Seeding.

3.04.01. Grassing Season. Grassed areas shall be sown evenly with a mechanical spreader to produce a uniform stand of grass.

Seed shall be "scratched in" with a rake and rolled with a light roller or cultipacker to firm the seed in the soil. The method of seeding may be varied, at the discretion of the Contractor, to establish a smooth, uniform grassed lawn.

The grass seed shall be sown uniformly at the rates indicated in these Specifications. Grass seed shall be sown only when the moisture content of the soil is suitable for sowing grass seed. The soil shall be kept in moist condition until seeds have germinated.

All grassed areas shall be mulched with clean grain straw.

Grassed areas shall be watered and maintained until an acceptable stand of grass is achieved.

3.05. Mulching and Protection. Seeded areas shall be mulched with straw at a rate of 2 tons per acre and tacked with water-emulsified asphalt at a rate of 150 gallons per ton of straw or other acceptable means.

All newly seeded areas with slopes equal to or greater than 3:1 shall be protected with erosion control matting.

Newly seeded areas shall be protected from unnecessary pedestrian traffic.

3.06. Mowing. The Landscape Subcontractor shall water, fertilize, mow, reseed, and maintain all lawn areas and low-maintenance grassing until an acceptable grass stand is achieved.

3.07. Maintenance. Work in this section shall be maintained from time of installation until the end of the guarantee period. Maintenance shall include watering of lawns, mowing, weeding, and repairs to lawn.

Original grades of the grass areas shall be maintained after commencement of planting operations and during the maintenance period. Any damage to the finished surface from construction operations shall be promptly repaired. In the event erosion occurs from either watering operations or rainfall, such damage shall be promptly repaired. Ruts, ridges, tracks, and other surface irregularities shall be corrected and areas replanted.

3.08. Cleanup and Completion. Upon completion of Work, all equipment and other articles used shall be removed from the Site. All excess soil, stones, and debris shall be removed and disposed of legally. All work areas shall be left in a clean and neat condition.

All damage to existing construction caused by landscaping operations shall be repaired to the satisfaction of the Owner in accordance with all local codes and approved by authorities having jurisdiction, at the Contractor's expense.

3.09. Guarantee and Replacement.

3.09.01. Seeding (Lawn). If a satisfactory stand of grass has been produced at the time of final completion, the lawn shall be guaranteed for a period of 60 days from date of inspection. If renovation and/or reseeded is required at the end of the guarantee period, the Work shall be done in conformance with the requirements of this section.

If a satisfactory stand of grass has not been produced at the time of final inspection, necessary repairs shall be performed in conformance with the requirements of this section. Upon completion of these repairs, the lawn shall be guaranteed as in the previous paragraph.

End of Section







Section 03302

MISCELLANEOUS CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1-1. SCOPE. This section covers all cast-in-place concrete, including reinforcing steel, forms, finishing, curing, and appurtenant work.

1-2. SUBMITTALS. All submittals of drawings and data shall be in accordance with the Submittals Procedures section.

PART 2 - PRODUCTS

2-1. LIMITING REQUIREMENTS. Unless otherwise specified, concrete shall be controlled within the following limiting requirements:

Cement Content	At least 526 lbs per cubic yard.
Maximum Water-Cement Ratio	The maximum water-cement ratio shall be 0.45 on a weight basis, or, if fly ash is used, the combined mass of cement plus fly ash shall be used to determine the water-cementitious materials ratio.
Fly Ash Content	At the option of Contractor, fly ash may be substituted for up to 25 percent of the Portland cement, on the basis of 1.0 lbs of fly ash added for each lb of cement reduction.
Concrete Strength	4,000 psi minimum compressive strength at 28 days.
Air Content	6 percent $\pm$ 1.5 percent.
Coarse Aggregate	Maximum nominal coarse aggregate size, 1 inch.
Admixtures	A water-reducing admixture and an air-entraining admixture shall be included in all concrete. No calcium chloride or admixture containing chloride from sources other than impurities in admixture ingredients will be acceptable.

Consistency Workable, without segregation, with slump not more than 5 inches when concrete is placed.

Mixing In accordance with ASTM C94.

## 2-2. MATERIALS.

Cement ASTM C150, Type I or II

Fly Ash ASTM C618, Class F, except loss on ignition shall not exceed 4 percent.

Fine Aggregate Non-reactive, clean, natural sand, ASTM C33.

Coarse Aggregate Non-reactive crushed rock, washed gravel, or other inert granular material conforming to ASTM C33, class 4S, except that clay and shale particles shall not exceed 1 percent.

Water Potable.

### Admixtures

Water-Reducing ASTM C494, Type A or D.

Air-Entraining ASTM C260.

Superplasticizing ASTM C494, Type F or G.

### Reinforcing Steel

Bars ASTM A615, Grade 60, deformed.

Welded Wire Fabric  
Bar Supports ASTM A185 or A497.  
CRSI Class 1, plastic protected; or Class 2, stainless steel protected.

Mechanical Connector  
(Couplers or Form  
Savers) Classified Type 2 per ACI 318. Use only where indicated on the drawings.

Form Coating Nonstaining and nontoxic after 30 days. Product shall not exceed VOC limits established by the federal, state, or local regulatory agency having jurisdiction over the project site.

Evaporation Reducer	Dayton Superior "AquaFilm Concentrate J74", Euclid "EucoBar", L&M Chemical "E-Con", BASF "Confilm", or Sika "SikaFilm".
Membrane Curing Compound and Floor Sealer	ASTM C1315, Type I, Class A, minimum 25 percent solids, acrylic, non-yellowing, unit moisture loss 0.40 kg/m <sup>2</sup> maximum in 72 hours. Product shall not exceed VOC limits established by the federal, state, or local regulatory agency having jurisdiction over the project site.
Polyethylene Film	Product Standard PS17 or ASTM D4397, 6 mils or thicker.

2-3. PRELIMINARY REVIEW. Reports covering the source and quality of concrete materials and the concrete proportions proposed for the work shall be submitted to Engineer for review before any concrete is placed.

2-4. FORMS. Forms shall be designed to produce hardened concrete having the shape, lines, and dimensions indicated on the drawings. Forms shall be substantial and sufficiently tight to prevent leakage of mortar and shall be maintained in proper position and accurate alignment. Forms shall be thoroughly cleaned and coated before concrete is placed and shall not be removed until the concrete has attained sufficient strength to safely support all loads without damage.

2-5. REINFORCEMENT. Reinforcement shall be accurately formed and positioned, and shall be maintained in proper position while the concrete is being placed and compacted. Reinforcement shall be free from dirt, loose rust, scale, and contaminants. Mechanical connectors shall be used only as indicated on the drawings.

### PART 3 - EXECUTION

3-1. PLACEMENT. Concrete shall be conveyed to the point of final deposit and placed by methods which will prevent segregation or loss of the ingredients. During and immediately after placement, concrete shall be thoroughly compacted and worked around all reinforcement and embedments and into the corners of the forms. Unless otherwise authorized, compaction shall be by immersion-type vibrators. The use of "jitterbug" tampers to compact concrete flatwork will not be permitted.

3-1.01. Polyethylene Film. Where concrete is placed against gravel or crushed rock which does not contain at least 25 percent material passing a No. 4 sieve, such surfaces shall be covered with polyethylene film. Joints in the film shall be lapped at least 4 inches and taped.

3-2. FINISHING. Fins and other surface projections shall be removed from all formed surfaces, except exterior surfaces that will be in contact with earth backfill. Surface voids and recesses resulting from removal of form ties shall be filled with mortar.

Unless otherwise specified, unformed surfaces shall be given a float finish.

3-2.01. Application of Evaporation Reducer. Concrete flatwork subject to rapid evaporation due to hot weather, drying winds, and sunlight shall be protected with an evaporation reducer. The evaporation reducer shall form a continuous film on the surface of fresh, plastic concrete to reduce evaporation.

Immediately following screeding, evaporation reducer shall be sprayed over the entire surface of fresh, plastic concrete flatwork at a rate of not less than 200 square feet per gallon, in accordance with the manufacturer's recommendations. The spray equipment shall have sufficient capacity to continuously spray the product at approximately 40 psi with a suitable nozzle as recommended by the manufacturer.

The sprayable solution shall be prepared as recommended by the manufacturer.

Under severe drying conditions, additional applications of evaporation reducer may be required following each floating or troweling, except the last finishing operation.

3-2.02. Sidewalks. Concrete surfaces shall be screeded to the proper elevation and contour. All aggregates shall be completely embedded in mortar. Screeded surfaces shall be given an initial float finish as soon as the concrete has stiffened sufficiently for proper working. Any piece of coarse aggregate which is disturbed by the float or which causes a surface irregularity shall be removed and replaced with mortar. Initial floating shall produce a surface of uniform texture and appearance, with no unnecessary working of the surface. Initial floating shall be followed by a second floating at the time of initial set.

Floated surfaces shall be given a light broom finish, using a horsehair broom, to provide a nonslip surface. Brooming shall be done at right angles to the length of the walk.

Sidewalks shall be edged using a 3 or 4 inch wide edging tool with a 1/8 inch corner radius. Edger lap marks at corners of each slab shall be carefully

removed. False joints shall be provided at right angles to the length of the walk, using a grooving tool with 1/8 inch radius. The finished edge on each side of the joint shall be the same width as the edging tool used. False joints shall divide each sidewalk into square sections.

The finished surface of all sidewalks shall be neat in appearance, shall be sloped to drain, and shall not pond water.

3-2.03. Curb and Gutter. Curb and gutter shall be finished to the shape indicated on the Drawings. After the forms have been removed, all exposed edges shall be rounded, using an edging tool with a 1/8 inch corner radius. Exposed surfaces shall be float finished and given a light broom finish applied at right angles to the curb at the time of initial set, using a horsehair broom.

3-3. CURING. Concrete shall be protected from loss of moisture for at least 7 days by membrane curing or by water curing. Membrane curing compound shall be applied as recommended by the manufacturer. Water curing shall be in accordance with ACI 308.1. Concrete shall be protected against freezing for at least 7 days following placement.

End of Section



## Section 03340

### LOW DENSITY CELLULAR CONCRETE

#### PART 1 - GENERAL

1-1. SCOPE. This Section includes filling the annular space between the carrier pipe and casing pipe with low density cellular concrete (LDCC) backfill. In the event of conflicts with the Tunnel Annular Backfilling Section, this specification takes precedence.

1-2. RELATED SECTIONS. The work of the following sections is related to the work of this Section. Other sections not referenced below may be related to the proper performance of this work.

Section 02231, Jack & Bore  
Section 02330, Tunnel Annular Backfilling

#### 1-3. QUALITY ASSURANCE.

1-3.01. Referenced Standards. This Section incorporates by reference the latest revision of the following documents. These references are a part of this Section as specified and modified. In case of conflict between the requirements of this Section and those of a listed document, the requirements of this Section shall prevail.

- a. American Concrete Institute (ACI):
  - (1) ACI 523.1 R, Cast in Place Low Density Concrete.
  - (2) ACI 523.3R, Cellular Concretes Above 50 pcf, and for Aggregate Concretes above 50 pcf with Compressive Strengths Less than 2500 psi.
  
- b. American Society for Testing and Materials (ASTM):
  - (1) ASTM C94, Ready Mixed Concrete.
  - (2) ASTM C138, Unit Weight, Yield, and Air Content (Gravimetric) of Concrete.
  - (3) ASTM C150, Portland Cement.
  - (4) ASTM C311, Fly Ash or Natural Pozzolans for Use as a Mineral Admixture in Portland-Cement Concrete.
  - (5) ASTM C495, Compressive Strength of Lightweight Insulating Concrete.
  - (6) ASTM C567, Unit Weight of Structural Lightweight Concrete.

- (7) ASTM C618, Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Portland Cement Concrete.
- (8) ASTM C796, Foaming Agents for Use in Producing Cellular Concrete Using Preformed Foam.
- (9) ASTM C869, Foaming Agents Used in Making Preformed Foam for Cellular Concrete.

1-3.02. Qualifications. The Contractor or Subcontractor supplying and placing LDCC shall be capable of developing a mix design, and batching, mixing, handling and placing LDCC under tunnel conditions; shall have furnished and placed LDCC on at least three projects which have been in successful operation; and shall have a record of experience and quality of work using LDCC that is satisfactory to the Engineer.

As an alternative, the Contractor may employ a manufacturer's representative to supervise supplying and placing of LDCC. The manufacturer's representative shall be capable of complying with the qualifications specified for the Contractor and shall be acceptable to the Engineer. The manufacturer's representative shall supervise all LDCC operations including training the Contractor's personnel, mixing designs, and placement of LDCC in the tunnel.

1-3.03. Personnel Qualifications. Workers, including the LDCC Contractor's superintendent and foreman, shall be fully qualified to perform the work. The LDCC Contractor's superintendent shall have had previous experience under similar ground and tunnel conditions or the LDCC supplying and placing shall be performed under the supervision of the foaming agent supplier's representative.

1-3.04. Field Services. The foaming agent material manufacturer shall provide engineering field services to review the project and the material application prior to any preparation; to approve the applicator, the material used, the equipment, and the procedure to be used; to approve setup before production of LDCC; and to observe during initial application. The field representative of the material manufacturer shall submit, in writing, approvals of proposed material, equipment, application procedures, applicator, and setup before production.

1-4. SYSTEM DESCRIPTION. Shall be in accordance with the Tunnel Annular Backfilling Section.

1-5. SUBMITTALS. The following shall be submitted in accordance with the Submittals Section.

1-5.01. Qualifications. Qualifications of Contractor, personnel and manufacturer.



1-5.02. Product Data. Mix designs for each cellular concrete mix proposed for use. Each mix design shall show the ingredients of the mix and shall include:

- a. Type, brand, source, and amounts of cement, pozzolans, admixtures, and other additives.
- b. Source and amount of water.
- c. Representative samples of materials for materials testing and mix proportion testing.
- d. Specific gravity of all materials.
- e. Results of required tests.
- f. A certificate of compliance signed by the supplier identifying the type of fly ash and stating that the fly ash is in accordance with ASTM C 618 and these specifications. Supporting test data shall be furnished when requested by the Engineer. All testing and sampling procedures shall be in accordance with ASTM C 311.
- g. Concrete Admixtures: Material specifications and instructions for use.
- h. Air content, unit weight, and compressive strength test results for proposed mix design.

1-5.03. Equipment. Manufacturer's specifications and operation instructions for equipment.

- a. Pumps.
- b. Foam generators and ancillary equipment.

1-5.04. Work Plan. The work plan for placing LDCC including sequence of work, type(s) of equipment, location of equipment, placing procedures, (i.e., batching, mixing, and pumping procedures), pumpline arrangement (including moving and breaking), end bulkhead details, communications provisions, methods for monitoring mix, testing procedures, monitoring of nearby structures, and cleanup procedures. The work plan shall include pumping pressures, pumping rates, volumes to be placed per day, injection locations, and sequence of placement and pumping.

1-5.05. Test Reports and Certifications.

- a. Mill test reports for cement.
- b. Certificates of compliance for each load of cement and pozzolan.
- c. Certificates of compliance for all admixtures.
- d. A delivery ticket with the information stated in Section 16 of ASTM C 94; excepting actual scale weights of materials shall be furnished to the Engineer with each batch of concrete before unloading at the site.

- e. A printout of the actual scale weights for all loads batched shall be submitted to the Engineer at the end of each working day.
- f. Field Quality Control Tests

Daily reports and records of concrete placement, including but not limited to, volumes placed, stationing of placement, injection locations, pressures, unit weight and air content testing results, time of placement, and designation of cylinder samples prepared that day.

1-6. PRODUCT DELIVERY STORAGE AND HANDLING. Contractor shall store and handle cementitious materials in accordance with ACI 301.

1-7. DEFINITIONS.

1-7.01. Low Density Cellular Concrete (LDCC). A lightweight cementitious material that contains stable air or gas cells uniformly distributed throughout the mixture of a volume percentage greater than 20 percent.

## PART 2 - PRODUCTS

2-1. MATERIALS.

2-1.01. Cement. Shall be Portland Cement, ASTM C 150, Type II.

2-1.02. Water. Shall conform to ASTM C94 with pH not less than 6.7. The Contractor shall furnish water to be used in mix. Water shall be fresh, clean, and free of sewage, oil, or organic matter and injurious amounts of acid, alkali, and salts or other damaging substances, which would adversely affect the setting time or strength of the LDCC.

2-1.03. Admixtures. Admixtures shall only be used when specifically approved by foaming agent supplier in writing for use in LDCC.

2-1.04. Foaming Agent. Foaming agent shall comply with ASTM C 869 when tested in accordance with ASTM C 796.

2-1.05. Flyash. Shall be Type F.

2-2. MIX DESIGN.

2-2.01. General. LDCC mix shall be designed in accordance with the requirements of ACI 523.1R, ACI 523.3R and the additional requirements specified herein. Mixes shall be adjusted in the field as necessary to meet the

requirements of these specifications. The foaming agent material manufacturer's field services representative shall approve all changes to the mix designs.

- a. Minimum 28-day compressive strength (ASTM C495): 200 psi.
- b. Minimum 56-day compressive strength (ASTM C495): 250 psi.

2-2.02. Limiting Requirements. Unless otherwise specified, each LDCC mix shall be designed and controlled within the following limits:

- b. LDCC for Tunnel Annular Backfilling:
  - (1) Wet Density: Wet density (unit weight) of the LDCC shall be not less than 50 pcf, plus or minus 5 pcf, at the point of placement, unless a higher density is required to achieve strength requirements.
- a. Only Type F fly ash will be permitted. Fly ash/cement ratios shall not exceed 1.0 by weight.

2-2.03. Preformed Foam. Preformed foam shall be generated by combining controlled quantities of air, water, and foaming agent under pressure. Foam shall retain its stability until the cement sets to form a self-supporting matrix. The resulting LDCC shall have essentially closed cell and low water absorptive characteristics. The concentration of foam agent shall be in accordance with the foaming agent material manufacturer's recommendations.

- a. Admixtures: The admixture content, batching method, and time of introduction to the mix shall be in accordance with the manufacturer's recommendations for minimum shrinkage and for compliance with these specifications. Admixtures may be used when specifically approved by foaming agent material manufacturer and shall be in accordance with their recommendations. No calcium chloride or admixture containing chloride from other than impurities from admixture ingredients will be acceptable.
- b. A test mix shall be designed and tested in accordance with ASTM C 796 for each consistency intended for use. These results will be compared with field test results to confirm consistent properties are obtained in the field. Testing for each mix shall be as follows:
- c. Two sets of compression test cylinders (3 inches by 6 inches), three cylinders per set, shall be made from each proposed LDCC mix. One set of three cylinders shall be tested at an age of 7 days and the other set shall be tested at an age of 28 days. LDCC test

specimens shall be made, cured, stored, and tested in conformity with ASTM C 495.

- d. Determine total air content of each proposed LDCC mix in accordance with ASTM C 796.
- e. Determine unit weight of each proposed LDCC mix in accordance with ASTM C 567.

### 2-3. EQUIPMENT.

2-3.01. Foam Generator. A foam generator shall be used to produce a predetermined quantity of preformed foam which shall be injected into the mixer and blended with the cement slurry. The foam generator shall be timer-controlled to repetitively discharge a preselected quantity or to discharge continuously at a fixed rate. Foam generating equipment shall be tested and calibrated for dilution percentage, density, and volume output. Two types of foam generating systems, batch and continuous generating, are acceptable.

The batch system shall consist of a tank in which the foam liquid concentrate and water are first premixed. This dilute solution is then discharged from either a pressurized tank or by means of a mechanical pump through a foam making nozzle in which this solution is blended with compressed air in fixed proportions.

A continuous generating system container, which continuously draws the concentrate directly from its shipping container, automatically blends it with water and compressed air in fixed proportions and forms the stable microbubbled foam.

Both types utilize a foam refining columns or nozzle calibrated for foam quality and discharge rate. The foam nozzles may be timer-controlled to repetitively discharge any preselected quantities or to discharge continuously at a fixed rate.

Batching, mixing and pumping equipment shall be compatible and of sufficient size and capacity to place LDCC to distances and volumes proposed by the Contractor.

Provide graphical or digital printout records of batch scale readings, accurate to one (1) pound, of the dry mix ingredients before delivery to mixer.

Specially designed batch mixers may also be used in conjunction with surge hopper equipped pumps. The rates of mixing and pumping shall be properly adjusted and a continuous flow of LDCC shall be obtained at the point of placement.

2-4. SOURCE QUALITY CONTROL. For any LDCC provided by an off-site source, Contractor shall provide measurement of materials from batching equipment to within the accuracies specified in ASTM C94. Test scales periodically in a manner and at intervals set forth in the approved Quality Control Plan.

Contractor shall provide mix design tickets for LDCC used each day, identifying the mix design criteria.

Contractor shall provide batch tickets for each load of LDCC in accordance with ASTM C94.

### PART 3 - EXECUTION

3-1. GENERAL. The Engineer shall be informed at least 24 hours in advance of the times and place where placement of LDCC is anticipated. LDCC shall be properly placed as specified herein. LDCC shall be made using preformed foam process equipment approved by the foaming agent material manufacturer.

#### 3-2. BATCHING AND MIXING.

3-2.01. General. Contractor shall conform to the requirements of accepted submittals and the foaming agent manufacturer's recommendations.

3-2.02. Mixing. All LDCC shall be mechanically mixed to produce a uniform distribution of the materials with a suitable consistency and the specified limiting requirements. Excessive mixing shall be avoided in order to reduce the possibility of changes in unit weight and consistency.

In batch mixing operations, the manufacturer's recommendations shall be formed concerning the order of charging the mixer with the various ingredients. The as-cast unit weight shall be monitored at the point of placement. Allowance should be made for any additional mixing that may result from the method of placement, such as mechanical or pneumatic pumping, and for any unit weight changes that may result from these methods.

For continuous mixing operations, provisions shall be made for reasonably uniform and continuous rate of addition of all mix components at appropriate positions in the mixing machine, and in the correct ratio, to assure uniformity and the specified limiting requirements at the point of placement.

Alternative methods for batching and mixing backfill may be considered but shall require approval from the Engineer.

### 3-3. EQUIPMENT.

The Contractor shall select and operate equipment to avoid damage to new or existing underground utilities and structures.

In selection of LDCC placement Contractor shall consider depth from surface, and volume.

Contractor shall operate any dewatering systems until the LDCC placement operations are complete.

Contractor shall verify that locations where LDCC is to be placed are clean and free of standing or running water.

Batch and mix LDCC in equipment of sufficient size and capacity to provide the necessary quality and quantity of LDCC for each placement.

Use equipment for LDCC of a type and size generally used for the work, capable of mixing grout to a homogeneous consistency, and providing means of accurately measuring LDCC component quantities and accurately measuring pumping pressures. Use pressure equipment which delivers backfill to the injection point at a steady pressure.

### 3-4. PLACEMENT.

3-4.01. General Requirements. All void space outside of the carrier pipe shall be completely filled with LDCC. LDCC shall be forced into all irregularities to completely fill the void space with LDCC to the maximum extent possible. LDCC shall be placed in accordance with submittals accepted by the Engineer.

3-4.02. Placement Limits. The limits of each LDCC placement shall be predetermined by the size and capacity of the batching equipment and the initial set time of the LDCC. Under no circumstance shall placement continue at an injection point longer than that period of time for the mix to take initial set. A stage of lift cannot be installed on another lift until a proper set has been attained. Have placement procedures approved by the admixture or additive manufacturer.

Where water inflows or zones of water seepage exceed 2 gpm, Contractor shall use suitable methods to divert groundwater inflows away from LDCC placement, at no additional cost to the Owner.

- a. Pressure gauges of appropriate range for monitoring the LDCC injection pressures shall be located in the line transporting the LDCC as close to the point of injection as possible.

- b. Contractor shall establish the limits of each LDCC placement based on size and capacity of batching and placing equipment and mix parameters such as initial set time.
- c. Contractor shall pump LDCC until a material discharge is similar in consistency to that at point of injection.

### 3-5. FIELD TESTING.

3-5.01. General. Field control tests, including unit weight (wet density), air content test, and compression tests of the LDCC shall be performed by the Contractor.

The frequency specified herein for each field control test is approximate. A greater or lesser number of tests may be made, as required by the Owner.

Test specimens shall be collected near LDCC is being injected.

Contractor shall supply all materials necessary for fabricating the test cylinders.

Contractor shall provide at or very near the point of injection, a system of valves in the line transporting the backfill, which will allow easy access for collection of test specimens without disconnecting the line from the outlet. Submit the valve arrangement to the Owner for review at least 15 days prior to commencing backfilling operations.

3-5.02. Unit Weight. Unit weight (wet density) tests shall be made from the first batch mixed each day, after a change in mix design, every 30 minutes during pumping, and from each batch of LDCC from which compression test cylinders are made. Unit weight shall be determined in accordance with ASTM C 567. Unit weight at the point of placement shall be within plus or minus 5 percent of the unit weight established for the mix design being placed. Adjust mix as required to obtain the specified wet density.

3-5.03. Air Content. An air content test shall be made from the first batch mixed each day, and from each batch of LDCC from which concrete compression test cylinders are made. Air content at the point of placement will be the difference between the wet density at the point of placement less the wet density at the point immediately before the addition of preformed foam. Air content shall be determined in accordance with ASTM C 138 except there will be no vibration or rodding of the sample.

3-5.04. Compression Tests: One set of six (6) test cylinders (3 inches by 6 inches) shall be made for each shift when LDCC is placed. One additional set shall be made from each additional 150 cubic yards, or major fraction thereof,

placed in any one shift. Two cylinders from each set will be tested at an age of 28 days and two cylinders from each set will be tested at an age of 56 days.

Compressive strength of LDCC shall be considered satisfactory if both of the following requirements are met:

- a. Average of three consecutive compressive strength tests equal or exceed the specified unconfined compressive strength.
- b. No individual compressive strength test (average of two cylinders) is below the specified unconfined compressive strength by more than 20 percent.

A strength test shall be the average of two compressive strengths of two cylinders made from the same concrete sample and tested at 28 days.

Test cylinders shall be made in the field, cured and stored in the laboratory, and tested in accordance with ASTM C 495.

Each set of compression test cylinders shall be marked or tagged with the date and time of day the cylinders were made, the location in the work where the LDCC represented by the cylinder was placed, batch number, unit weight (wet density), and the air content.

3-6. PROTECTION, PATCHING AND CLEANUP. The Contractor shall take all necessary precautions to protect and preserve the carrier pipe from damage. Spills shall be minimized and shall be cleaned up immediately. Any damage to the carrier pipe caused by or occurring during the LDCC placement operations shall be repaired by a method approved by the Engineer, at no additional cost to the Owner.

During LDCC placement, provide for adequate disposal of all waste and wastewater. Remove and properly dispose of all waste resulting from LDCC placement operations.

Upon completion of the LDCC placement operations, the Contractor shall remove all formwork, bulkheads, or other material used to contain the LDCC and all grout supply connections from embedded pipe. Prior to final acceptance of the work, the interior surface of the final lining shall be cleaned of excess cement or grout, mortar, oil, and grease to the greatest extent practicable, as determined by the Engineer.

End of Section







Section 05550  
ANCHORAGE IN CONCRETE AND MASONRY

PART 1 - GENERAL

1-1. SCOPE. This section covers the procurement and installation of anchors in concrete and masonry. It includes cast-in-place anchor bolts and anchor rods, adhesive anchors for both threaded rods and reinforcing bars, expansion anchors, and undercut anchors.

1-2. GENERAL. Unless otherwise specified or indicated on the Drawings all anchors shall be cast-in-place anchor bolts or anchor rods, with forged heads or embedded nuts and washers. Unless otherwise indicated, anchors in concrete shall have a diameter of at least 3/4 inch and anchors in masonry shall have a diameter of at least 1/2 inch.

Unless otherwise indicated on the Drawings, anchors used in the following locations and applications shall be of the indicated materials. Anchors in other locations and applications shall be as indicated on the Drawings.

Cast-In-Place Anchor Bolts and Anchor Rods

Submerged locations	Stainless steel.
Locations subject to splashing	Stainless steel.
Buried locations	Stainless steel.
Anchorage of structural steel columns	Galvanized steel.
Other exterior locations	Galvanized steel.
Other interior locations	Carbon steel.

Adhesive, Expansion, and Undercut Anchors

Submerged locations	Stainless steel.
Locations subject to splashing	Stainless steel.
Buried locations	Stainless steel.
Anchorage of structural steel columns	Stainless steel.
Other exterior locations	Stainless steel.

Other interior locations

Carbon steel.

Adhesive, expansion, and undercut anchors may be used instead of cast-in-place anchors only where specifically indicated or permitted on the Drawings or with the specific acceptance by Engineer.

1-3. SUBMITTALS. Data, catalog cuts, and International Code Council Evaluation Service (ICC-ES) reports indicating the manufacturer and types of adhesive anchors, expansion anchors, and undercut anchors to be supplied shall be submitted in accordance with the Submittals Procedures section.

If Contractor requests use of products other than those indicated herein, calculations prepared by a registered professional engineer using methods and procedures required by the building code may be required as part of the submittal package.

1-4. DELIVERY, STORAGE, AND HANDLING. Materials shall be handled, transported, and delivered in a manner which will prevent damage or corrosion. Damaged materials shall be promptly replaced. Materials shall be shipped and stored in original manufacturer's packaging.

PART 2 - PRODUCTS

2-1. MATERIALS. Unless otherwise indicated on the Drawings, materials shall be as indicated below.

Cast-In-Place Anchor Bolts and Anchor Rods

Carbon steel	ASTM F1554, Grade 36 with compatible nuts.
Galvanized steel	ASTM F1554, Grade 36 with compatible nuts; hot-dip galvanized, ASTM F2329.
Stainless steel	Bolts, ASTM F593, Alloy Group 1 or 2; nuts, ASTM F594, Alloy Group 1 or 2.
Flat Washers	ANSI B18.22.1; of the same material as anchor bolts and nuts.

Expansion Anchors in Concrete	Products shall be single component anchors tested in accordance with ICC AC193, and shall have an ICC ES report in compliance with the applicable building code. The anchors shall be approved for use in cracked concrete, and for resisting seismic forces. Hilti "Kwik-Bolt TZ", Powers Fasteners "Power-Stud+SD2", Simpson "Strong-Bolt 2".
Expansion Anchors in Grouted Masonry	Products shall be single component anchors tested in accordance with ICC AC01, and shall have an ICC ES report in compliance with the applicable building code. Hilti "Kwik-Bolt 3", Simpson "Wedge-All", Powers Fasteners "Power-Stud+ SD1".
Undercut Anchors in Concrete	Products shall be tested in accordance with ICC AC193, and shall have an ICC ES report in compliance with the applicable building code. Hilti "HDA Undercut Anchor", Powers Fasteners "Atomic+ Undercut Anchor", Simpson "Torq-Cut Anchor".
Adhesive Anchors in Concrete	Products shall be tested in accordance with ICC AC308, and shall have an ICC ES report in compliance with the applicable building code. The anchors shall be approved for use in cracked concrete, and for resisting seismic forces.
Threaded Rods and Nuts	As recommended by the adhesive manufacturer; materials as indicated on the Drawings or in this specification.
Reinforcing Bars	ASTM A615, Grade 60, deformed.
Reinforcing Bars, weldable	ASTM A706, Grade 60, deformed.
Adhesive	Hilti "HIT-HY 200", Powers Fasteners "PE1000+", Simpson "SET-XP".

Adhesive Anchors in Grouted Masonry	Products shall have published design criteria values and manufacturer's printed installation instructions.
Threaded Rods and Nuts	As recommended by the adhesive manufacturer; materials as indicated on the Drawings or in this specification.
Adhesive	Hilti "HIT HY 70", Simpson "SET Epoxy".
Adhesive Anchors in Hollow Masonry	Products shall have published design criteria values and manufacturer's printed installation instructions.
Threaded Rods and Nuts	As recommended by the adhesive manufacturer; materials as indicated on the Drawings or in this specification.
Adhesive	Hilti "HIT HY 70", Simpson "SET Epoxy".
Screen Tubes	As recommended by the manufacturer.
Adhesive Anchors in Unreinforced Brick Masonry	Products shall be tested in accordance with ICC AC60, and shall have an ICC ES report in compliance with the applicable building code.
Threaded Rods and Nuts	As recommended by the adhesive manufacturer; materials as indicated on the Drawings or in this specification.
Adhesive	Hilti "HIT HY 70", Simpson "SET Epoxy".
Screen Tubes	As recommended by the manufacturer.

2-2. ANCHORS.

2-2.01. Cast-in-Place Anchor Bolts and Anchor Rods. Cast-in-place anchor bolts and anchor rods shall be delivered in time to permit setting prior to the placing of structural concrete or masonry grout. Anchor sleeves shall not be used unless acceptable to Engineer. Unless installed in sleeves, anchor bolts and anchor rods shall be provided with sufficient threads to permit a nut to be installed on the concrete side of the concrete form or the supporting template.

Two nuts, a jam nut, and a washer shall be furnished for cast-in-place anchor bolts and anchor rods indicated on the Drawings to have locknuts; two nuts and a washer shall be furnished for cast-in-place anchor bolts and anchor rods without locknuts.

2-2.02. Adhesive, Expansion, and Undercut Anchors. When adhesive, expansion, or undercut anchors are indicated on the Drawings, only acceptable systems shall be used. Acceptable systems shall include only those systems and products specified or specifically indicated by product name on the Drawings. Alternative anchoring systems may be used only when specifically accepted by Engineer.

Unless otherwise required, single nuts and washers shall be furnished for adhesive anchors, expansion anchors, and undercut anchors. Adhesive anchors shall be free of coatings that would weaken the bond with the adhesive.

Adhesive anchors in hollow CMU masonry and unreinforced brick masonry shall utilize screen tubes as recommended by the manufacturer.

### PART 3 – EXECUTION

3-1. GENERAL. Anti-seize thread lubricant shall be liberally applied to projecting, threaded portions of stainless steel anchors immediately before tightening of the nuts.

3-1.01. Compliance With Manufacturer's Instructions. Post-installed anchors shall be installed in accordance with the manufacturer's printed installation instructions and all applicable requirements of the ICC-ES report for the specific anchor system. If conflicts are found between the Drawings, the manufacturer's printed installation instructions, and the ICC-ES report installation requirements, Contractor shall notify Engineer for resolution.

3-1.02. Special Inspection. Not used.

3-2. CAST-IN-PLACE ANCHOR BOLTS AND ANCHOR RODS. Cast-in-place anchor bolts and anchor rods shall be carefully positioned with templates and secured in the forms prior to placing concrete, or in the bond beams prior to placing masonry grout. Contractor shall verify that anchorage devices are positioned in accordance with the Drawings and with applicable equipment or structure submittal drawings.

Threads, bolts, and nuts spattered with concrete or masonry grout during placement shall be cleaned prior to final installation of the bolts and nuts.

Sleeves shall be filled with non-shrink grout.

3-3. ADHESIVE ANCHORS. Adhesive shall be statically mixed in the field during application. All proportioning and mixing of the components shall be in accordance with the manufacturer's recommendations.

Anchors or bars shall be installed in holes hammer drilled into hardened concrete or masonry. Drill shall be set to rotation-only mode when drilling into hollow CMU or into brick. Diameter of holes shall be 1/16 inch larger than the outside diameter of the rod or bar unless recommended otherwise by the anchor system manufacturer. Holes shall be prepared by removing all dust and debris using procedures recommended by the adhesive manufacturer.

Adhesive anchors and holes shall be clean, dry, and free of grease and other foreign matter at the time of installation. The adhesive shall be placed and the rods or bars shall be set in accordance with the recommendations of the manufacturer. Care shall be taken to ensure that all spaces and cavities are filled with adhesive, without voids.

3-3.01. Concrete Installation. Unless indicated otherwise on the Drawings, reinforcing bars shall be embedded to a depth that will develop the full tensile strength of the bar, and threaded rods shall be embedded to a depth that will develop the yield strength of the rod.

Adhesive anchors in concrete shall be installed under the following conditions.

Minimum Age of Concrete Prior to Anchor Installation	21 days.
Concrete Temperature Range	Maximum short-term temperature 162 F, maximum long-term temperature 110 F.
Moisture Condition	Dry concrete.
Type of Lightweight Concrete	N/A
Hole Drilling and Preparation	Hammer drill only.

Installation of adhesive anchors into concrete that are either horizontal or upwardly inclined shall be performed only by personnel certified by the ACI/CRSI Adhesive Anchor Installation Certification Program.

3-3.02. Masonry Installation. Not used.



3-4. EXPANSION AND UNDERCUT ANCHORS. Expansion and undercut anchors shall be installed using all procedures and accessory devices recommended by the anchor manufacturer.

End of Section







Section 09940

PROTECTIVE COATINGS

PART 1 - GENERAL

1-1. SCOPE. This section covers field applied protective coatings, including surface preparation, protection of surfaces, inspection, and other appurtenant work for equipment and surfaces designated to be coated with heavy-duty maintenance coatings. Regardless of the number of coats previously applied, at least two field coats in addition to any shop coats or field prime coats shall be applied to all surfaces unless otherwise specified.

1-2. GENERAL. Cleaning, surface preparation, coating application, and thickness shall be as specified herein and shall meet or exceed the coating manufacturer's recommendations. When the manufacturer's minimum recommendations exceed the specified requirements, Contractor shall comply with the manufacturer's minimum recommendations. When equivalent products are acceptable to Engineer, Contractor shall comply with this Specification and the coating manufacturer's recommendations.

1-2.01. Governing Standards. All cleaning, surface preparation, coating application, thickness, testing, and coating materials (where available) shall be in accordance with the referenced standards of the following AWWA, ANSI, NACE, SSPC, NSF, and ASTM.

1-2.02. Delivery and Storage. All coating products shall be received and stored in accordance with the coating manufacturer's recommendations.

1-2.03. Coatings, Painting, and Linings Covered in Other Sections. Not used.

1-3. SUBMITTALS. Contractor shall submit color cards for all coatings proposed for use, together with complete descriptive specifications, manufacturer's product data sheet and the completed Coating System Data Sheets, to Engineer for review and color selection. Each product data sheet shall include application temperature limits including recoat time requirements for the ambient conditions at the site, including temperatures up to 130°F. Requests for review submitted directly to Engineer by coating suppliers will not be considered.

When the proposed products will be in contact with treated or raw water in potable water treatment facilities, Contractor shall submit certifications that the proposed systems are in compliance with ANSI/NSF 61.



A2<sub>1</sub> may be assigned to “Epoxy – two coats to non-galvanized structural and miscellaneous steel exposed to view inside buildings.”

C2<sub>1</sub> may be assigned to “Epoxy – two coats to all concrete and concrete block in corrosive area (Except floors and surfaces scheduled to receive other coatings) which are exposed to view.”

C2<sub>2</sub> may be assigned to “Epoxy – two coats to walls, floors, and curbed areas, adjacent to corrosive chemical storage and feed equipment as indicated on the Drawings.”

For the epoxy and for aliphatic polyurethane, a total of not more than 15 custom colors (excluding deeptone or high-level colors) may be required. The manufacturer's standard colors will be acceptable for all other coatings. The manufacturer's standard colors will be acceptable for all coatings.

#### 1-4. QUALITY ASSURANCE.

1-4.01. Coating System Data Sheet Certifications. Not used.

1-4.02. Special Interior Coating Systems. Not used

### PART 2 - PRODUCTS

#### 2-1. ACCEPTABLE MANUFACTURERS.

2-1.01. Alternative Manufacturers. In addition to the coatings listed herein, equivalent products of other manufacturers that distribute globally will also be acceptable.

2-1.02. Equivalent Coatings. Whenever a coating is specified by the name of a proprietary product or of a particular manufacturer or vendor, it shall be understood as establishing the desired type and quality of coating. Other manufacturers' coatings will be accepted, provided that sufficient information is submitted to enable Engineer to determine that the proposed coatings are equivalent to those named. Information on proposed coatings shall be submitted for review in accordance with the Submittals Procedures section. Requests for review of equivalency will be accepted only from Contractor and will be considered only after the contract has been awarded.

2-2. MATERIALS. All coatings shall be delivered to the job in original, unopened containers, with labels intact. Coatings shall be stored indoors and shall be protected against freezing. No adulterant, unauthorized thinner, or other material not included in the coating formulation shall be added to the coating for any purpose.

All coatings shall conform to the air quality regulations applicable at the location of use. Coating materials that cannot be guaranteed by the manufacturer to conform, whether or not specified by product designation, shall not be used.

With the exception of heat resistant coatings, the coatings specified have been selected on the basis of the manufacturer's statement that the VOC content of the product is 2.8 lbs per gallon or less; however, it shall be the Contractor's responsibility to use only coating materials that are in compliance with the requirements of all regulatory agencies. Local regulations may require some coatings to have a lower VOC content than specified herein. The coatings specified may meet the VOC limits in the unthinned (as shipped) condition but may exceed the limits if thinned according to the manufacturer's recommendations. In such case, the coatings shall not be thinned beyond the 2.8 lbs per gallon limit, and if the product cannot be thinned to suit the application method or temperature limits, another manufacturer's coating shall be used, subject to acceptance by Engineer.

Contractor shall be responsible for ensuring the compatibility of field coatings with each other or with any previously applied coatings. Coatings used in successive field coats shall be produced by the same manufacturer. The first field coat over shop coated or previously coated surfaces shall cause no wrinkling, lifting, or other damage to underlying coats.

All coatings used on surfaces that will be in contact with potable or treated water shall be certified as being in compliance with ANSI/NSF 61. Coatings that cannot be so certified, whether or not specified by manufacturer and by product designation, shall not be used.

All intermediate and finish coating materials that will be in contact with wastewater atmosphere shall be guaranteed by the manufacturer to be fumeproof and suitable for wastewater plant atmosphere that contains hydrogen sulfide. Coatings that cannot be so guaranteed shall not be used. Lead-free, chromium-free, and mercury-free coatings shall be used.

#### 2-2.01. Primers.

Universal Primer (tie coat)	PPG Amercoat "Amercoat 385 Epoxy", Carboline "Rustbond", ICI Devoe "Devran 224HS", Tnemec "Series 27 F.C. Typoxy", or Sherwin-Williams "Dura Plate 235".
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Zinc Primer	PPG Amercoat "Dimetate 9 Series", Carboline "Carbo Zinc II Series", ICI Devoe "Catha-Coat 304V", or Sherwin-Williams "Zinc Clad II Series".
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2-2.02. Fillers and Surfacers.

Epoxy Concrete Block Filler	PPG Amercoat "Amerlock 400BF Epoxy Block Filler", Carboline "Sanitile 600", ICI Devoe "Truglaze 4015", Tnemec "Series 54-562", or Sherwin-Williams "Kem Cati-Coat HS".
Epoxy Concrete Filler and Surfacers	Tnemec "Series 218 MortarClad", PPG Amercoat "NuKlad 114A", Carboline "Carboguard 510", or Sherwin-Williams "Steel Seam FT910".

2-2.03. Intermediate and Finish Coatings.

Epoxy (NSF certified systems)

Ferrous Metal Surfaces and Concrete Surfaces in Contact with Treated or Raw Water in Potable Water Facilities	PPG Amercoat "Amerlock 400 High-Solids Epoxy Coating", Carboline "Carboguard 891", ICI Devoe "Bar-Rust 233H" Tnemec "Series N140 Pota-Pox Plus", or Sherwin-Williams "Dura Plate 235 NSF"; immersion service.
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Epoxy

Concrete Floors	PPG Amercoat "Amerlock 400", Carboline "Carboguard 890", ICI Devoe "Devran 224HS", Tnemec "Series N69 Hi-Build Epoxoline II", or Sherwin-Williams "Armorseal 1000HS"; nonskid.
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Ferrous Metal Surfaces and Masonry or Concrete Surfaces Other Than Floors	PPG Amercoat "Amercoat 385 Epoxy", Carboline "Carboguard 890", ICI Devoe Devran "224HS", Tnemec "Series N69 Hi-Build Epoxoline II", or Sherwin-Williams "Dura Plate 235".
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Flake-Filled Epoxy	Carboline "Plasite 4500/4500S", Sherwin-Williams "Sher-Glass FF",
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Aliphatic Polyurethane	PPG Amercoat "Amercoat 450H", Carboline "Carbothane 134HG", ICI Devoe "Devthane 379H" Tnemec "Series 1074 Endura-Shield II", or Sherwin- Williams "Acrolon 218HS".
Coal Tar Epoxy	High-build coal tar epoxy; PPG Amercoat "Amercoat 78HB Coal Tar Epoxy", Carboline "Bitumastic 300 M", Tnemec "46H-413 Hi-Build Tneme-Tar", or Sherwin- Williams "Hi-Mil Sher-Tar Epoxy".
Medium Consistency Coal Tar	Carboline "Bitumastic 50" or Tnemec "46-465 H.B. Tnemecol".
Vinyl Ester	Tnemec "Series 120 Vinester" Carboline "Plasite 4110" or Sherwin-Williams "Magnalux 304FF".
Heat-Resistant	Suitable for temperatures up to 400°F [207°C]; PPG Amercoat "Amerlock 400", Carboline "Thermaline 450", Tnemec "43-36 Chrome Aluminum", or Sherwin- Williams "Silver-Brite Aluminum".
High Heat-Resistant	Suitable for temperatures up to 1000°F [537°C]; PPG Amercoat "Amercoat 878", Carboline "Thermaline 4700 VOC", or Sherwin-Williams "Silver-Brite Hi- Heat Silicone Aluminum".

### PART 3 - EXECUTION

3-1. SURFACE PREPARATION. All surfaces to be coated shall be clean and dry and shall meet the recommendations of the coating manufacturer for surface preparation. Freshly coated surfaces shall be protected from dust and other contaminants. Oil and grease shall be completely removed by use of solvents or detergents before mechanical cleaning is started. The gloss on previously coated surfaces shall be dulled if necessary, for proper adhesion of topcoats.

Surfaces shall be free of cracks, pits, projections, or other imperfections that would interfere with the formation of a smooth, unbroken coating film, except for concrete block construction where a rough surface is an inherent characteristic.

When applying touchup coating or repairing previously coated surfaces, the surfaces to be coated shall be cleaned as recommended by the coating manufacturer, and the edges of the repaired area shall be feathered by sanding or wire brushing to produce a smooth transition that will not be noticeable after the coating is applied. All coatings made brittle or otherwise damaged by heat of welding shall be completely removed.

3-1.01. Galvanized Surfaces. Galvanized surfaces shall be prepared for coating according to the instructions of the manufacturer of the epoxy. Any chemical treatment of galvanized surfaces shall be followed by thorough rinsing with clean water.

3-1.02. Ferrous Metal Surfaces. Ungalvanized ferrous metal surfaces shall be prepared for coating by using one or more of the following cleaning procedures specified here-in: solvents (SSPC-SP1); abrasive blasting (SSPC-SP5, -SP10, -SP6, or -SP7) power tools (SSPC-SP3 or -SP11); or hand tools (SSPC-SP2). Oil and grease shall be completely removed in accordance with SSPC-SP1 before beginning any other cleaning method. Surfaces of welds shall be scraped and ground as necessary to remove all slag and weld spatter. Tools which produce excessive roughness shall not be used.

All components of equipment that can be properly prepared and coated after installation shall be installed prior to surface preparation. Components that will be inaccessible after installation shall have the surfaces prepared and coated before installation. Motors, drive trains, and bearings shall be protected during surface preparation in accordance with the equipment manufacturer's recommendations.

All cut or sheared edges shall be ground smooth to a 1/8 inch minimum radius for all material 1/4 inch thickness and larger. For material thickness less than 1/4 inch all cut or sheared edges shall be ground smooth to a radius equal to 1/2 the material thickness. Grinding of rolled edges on standard shapes with a minimum radius of the 1/16 inch will not be required.

All ferrous metal surfaces shall have all welds ground smooth and free of all defects in accordance with NACE Standard SP0178, Appendix C, Designation C and sharp edges ground smooth, if not previously prepared in the shop. Instead of blending of the weld with the base metal as required by the NACE standard, it will be acceptable to furnish a welded joint that has a smooth transition of the weld to the base metal. All welds shall be ground smooth to ensure satisfactory adhesion of paint.

The cleaning methods and surface profiles specified herein are minimums, and if the requirements printed in the coating manufacturer's data sheets exceed the limits specified, the value printed on the data sheets shall become the minimum requirement.

3-1.02.01. Ferrous Metal Surfaces – Non-immersion Service. Ferrous metal surfaces, including fabricated equipment, in non-immersion service shall be cleaned to the degree recommended by the coating manufacturer for surfaces to be coated with coal tar epoxy, epoxy, and heat-resistant coatings, except galvanized surfaces. Surface preparation of ferrous metal surfaces in non-immersion service shall consist of abrasive blast cleaning to SSPC-SP6, and the first application of coating shall be performed on the same day. If more surface area is prepared than can be coated in one day, the uncoated area shall be blast cleaned again to the satisfaction of Engineer. Surface profile shall be as recommended by coating manufacturer, but not less than 2.0 mils.

3-1.02.02. Ferrous Metal Surfaces - Immersion Service. Surface preparation of ferrous metal surfaces in immersion service shall consist of abrasive blast cleaning to at least SSPC-SP10 and the first application of coating shall be performed on the same day. If more surface area is prepared than can be coated in one day, the uncoated area shall be blast cleaned again to the satisfaction of Engineer. Surface profile shall be as recommended by coating manufacturer, but not less than 3.5 mils.

3-1.03. Concrete Surfaces. All concrete surfaces shall be free of objectionable substances and shall meet the coating manufacturer's recommendations for surface preparation. Concrete surfaces shall be prepared in accordance with SSPC-SP13/NACE 6. Any other surface preparation recommended by the coating material manufacturer shall be brought to Engineer's attention and may be incorporated into the work if acceptable to Engineer.

All concrete surfaces shall be dry when coated and free from dirt, dust, sand, mud, oil, grease, and other objectionable substances. Oil and grease shall be completely removed by use of solvents or detergents before mechanical cleaning is started.

New concrete shall have cured for at least 4 weeks before coating is applied as recommended by the material manufacturer. Concrete surfaces shall be tested for capillary moisture in accordance with ASTM D4263. There shall be no capillary moisture when coatings are applied on concrete.

All surfaces to be coated shall be cleaned in accordance with ASTM D4258 and abraded in accordance with ASTM D4259. Surface profile shall be at least 25 percent of the dry film thickness specified for the coating system. Prior to application of the coating, the surfaces shall be thoroughly washed or cleaned by

air blasting to remove all dust and residue. Spalled areas, voids, and cracks shall be repaired in accordance with the Concrete section and as acceptable to the Engineer. Fins and other surface projections shall be removed to provide a flush surface before application of coating.

Except where epoxy is applied as damp-proofing, the concrete surfaces, including those with bug holes less than 1 inch in any dimension, shall be prepared as recommended by the manufacturer, using an epoxy concrete filler and surfacer. Where coating with a vinyl ester the concrete filler and surfacer shall be as recommended by the manufacturer to be compatible with vinyl ester.

3-1.04. Concrete Block Surfaces. Voids and openings in concrete block surfaces shall be pointed. All exposed exterior surfaces and surfaces to be coated with epoxy, including the joints, shall be filled so that a continuous unbroken coating film is obtained.

3-1.05. Copper Tubing. All flux residue shall be removed from joints in copper tubing. Immediately before coating is started, tubing shall be wiped with a clean rag soaked in xylol.

3-1.06. Plastic Surfaces. All wax and oil shall be removed from plastic surfaces that are to be coated, including PVC and FRP, by wiping with a solvent compatible with the specified coating.

3-1.07. Hardware. Hardware items such as bolts, screws, washers, springs, and grease fittings need not be cleaned prior to coating if there is no evidence of dirt, corrosion, or foreign material.

3-1.08. Aluminum. When a coating system is required, remove all oil or deleterious substance with neutral detergent or emulsion cleaner or blast lightly with fine abrasive.

3-1.09. Stainless Steel. When a coating system is required, surface preparation shall conform to the coating manufacturer's recommendations.

3-2. MIXING AND THINNING. Coating shall be thoroughly mixed each time any is withdrawn from the container. Coating containers shall be kept tightly closed except while coating is being withdrawn.

Coating shall be factory mixed to proper consistency and viscosity for hot weather application without thinning. Thinning will be permitted only as necessary to obtain recommended coverage at lower application temperatures. In no case shall the wet film thickness of applied coating be reduced, by addition of coating thinner or otherwise, below the thickness recommended by the coating

manufacturer. Thinning shall be done in compliance with all applicable air quality regulations.

3-3. APPLICATION. Coating shall be applied in a neat manner that will produce an even film of uniform and proper thickness, with finished surfaces free of runs, sags, ridges, laps, and brush marks. Each coat shall be thoroughly dry and hard before the next coat is applied. Each coat shall be a different color, if available. In no case shall coating be applied at a rate of coverage greater than the maximum rate recommended by the coating manufacturer.

Coating failures will not be accepted and shall be entirely removed down to the substrate and the surface recoated. Failures include but are not limited to sags, checking, cracking, teardrops, fat edges, fisheyes, or delamination.

3-3.01. Priming. Edges, corners, crevices, welds, and bolts shall be given a brush coat (stripe coat) of primer before application of the primer coat. The stripe coat shall be applied by a brush and worked in both directions. Special attention shall be given to filling all crevices with coating. When using zinc primers the stripe coat shall follow the initial prime coat.

Abraded and otherwise damaged portions of shop-applied coating shall be cleaned and recoated as recommended by the manufacturer of the finish coating. Welded seams and other uncoated surfaces, heads and nuts of field-installed bolts, and surfaces where coating has been damaged by heat shall be given a brush coat of the specified primer. Before the specified spot or touchup coating of metal surfaces, edges, corners, crevices, welds, and bolts in the area of the spot or touchup coating shall be given a brush coat of primer. This patch, spot, or touchup coating shall be completed, and the paint film shall be dry and hard, before additional coating is applied.

3-3.02. Epoxy. When used, epoxy shall be applied in accordance with the coating manufacturer's recommendations, including temperature limitations and protection from sunlight until top-coated.

When concrete is to be coated, coatings shall not be applied to concrete surfaces in direct sunlight or when the temperature of the concrete is rising. Preferably the coating shall be applied when the temperature of the concrete is dropping.

When applying high build epoxy coatings with a roller or brush and where a dry film thickness of at least 4-6 mils per coat is required, two or more coats shall be applied to achieve the recommended dry film thickness equal to a spray applied coating.



Coatings shall not be applied at temperatures lower than the minimum temperature recommended by the coating manufacturer, or to metal surfaces such as tanks or pipe containing cold water, regardless of the air temperature, when metal conditions are likely to cause condensation. When necessary for proper application, a temporary enclosure shall be erected and kept heated until the coating has fully cured.

Coatings shall not be applied at temperatures higher than the maximum temperature recommended by the coating manufacturer. Where coatings are applied during periods of elevated ambient temperatures, Contractor and the coatings manufacturer shall be jointly responsible to ensure that proper application is performed including adherence to all re-coat window requirements. Precautions shall be taken to reduce the temperature of the surface application, especially for metal, at elevated temperatures above 100°F including shading application area from direct sunlight, applying coating in the evening or at night, and ventilating the area to reduce the humidity and temperature,

Vinyl ester coating materials, when required, shall be maintained during transportation, storage, mixing, and application at the temperature required by the coating manufacturer, 35°F to 90°F.

3-4. REPAIRING FACTORY FINISHED SURFACES. Factory finished surfaces damaged prior to acceptance by Owner shall be spot primed and recoated with materials equivalent to the original coatings. If, in the opinion of Engineer, spot repair of the damaged area is not satisfactory, the entire surface or item shall be recoated.

3-5. PROTECTION OF SURFACES. Throughout the work Contractor shall use drop cloths, masking tape, and other suitable measures to protect adjacent surfaces. Contractor shall be responsible for correcting and repairing any damage resulting from its or its subcontractors' operations. Coatings spilled or splattered on adjacent surfaces which are not being coated at the time shall be immediately removed. Exposed concrete or masonry not specified to be coated which is damaged by coatings shall be either removed and rebuilt or, where authorized by Owner, coated with two coats of masonry coating.

3-6. FIELD QUALITY CONTROL. The following inspection and testing shall be performed: surface profile, visual inspection, spark testing, adhesion testing, and wet and dry film thickness testing. All inspection and testing shall be witnessed by Engineer.

3-6.01. Surface Profile Testing. The surface profile for ferrous metal surfaces shall be measured for compliance with the specified minimum profile. The surface profile for concrete shall comply with SSPC 13/NACE 6 Table 1 for severe service.



3-6.02. Visual Inspection. The surface of the protective coatings shall be visually inspected.

3.6.03. Film Thickness. Coating film thickness shall be verified by measuring the film thickness of each coat as it is applied and the dry film thickness of the entire system. Wet film thickness shall be measured with a gauge that will measure the wet film thickness within an accuracy of  $\pm 0.5$  mil. Dry film thickness shall be measured in accordance with SSPC-PA 2.

3-6.04. Spark Testing. Not used.

3-6.05. Adhesion Testing. Not used.

3-7. FIELD PRIMING SCHEDULE. In general, steel and cast iron surfaces of equipment are specified to be shop primed. Any such surfaces which have not been shop primed shall be field primed. Damaged or failed shop coatings which have been determined unsuitable by Engineer shall be removed and the surfaces shall be field coated, including prime coat (if any). Galvanized, aluminum, stainless steel, and insulated surfaces shall be field primed. Primers used for field priming, unless otherwise required for repair of shop primers, shall be:

<u>Surface To Be Primed</u>	<u>Material</u>
Equipment, surfaces to be coated with	
Aliphatic polyurethane	Universal primer.
Epoxy	Same as finish coats.
Coal tar coating	Same as finish coats.
Vinyl ester	Same as finish coats.
Steel and cast iron, surfaces to be coated with	
Epoxy	Same as finish coats or inorganic zinc.
Coal tar coating	Same as finish coats.
Aluminum	Epoxy.
Galvanized	Epoxy.
Copper	Epoxy.
Stainless steel	Epoxy.
Plastic surfaces, including PVC and FRP	Same as finish coats.
Insulated piping	As recommended by manufacturer of finish coats.
Concrete, surfaces to be coated with epoxy	
For damp-proofing	Epoxy.

Surface To Be Primed  
For all other surfaces

Concrete block exposed in exterior locations  
Concrete block to be coated with epoxy

Material  
Epoxy concrete filler and surfacer.  
Epoxy concrete block filler.  
Epoxy concrete block filler.

Unless otherwise recommended by the coating manufacturer or specified herein, priming will not be required on concrete, or concrete block, nor on metal surfaces specified to be coated with coal tar epoxy, and heat-resistant coatings. Concrete surfaces to be coated with epoxy shall be filled with epoxy concrete filler and surfacer so that a continuous film is obtained, except where concrete is damp-proofed with epoxy.

3-8. FINISH COATING SYSTEMS. The following schedule lists coatings systems and coating surface designations. See Article 1-3 for a definition of the surface designations.

No.	Finish Coating Systems	Coating Surface Designation						
		A	C	E	F	G	H	P
1.	Epoxy – One coat	x			x	x		
2.	Epoxy – Two coats	x	x	x	x	x		x
3.	Epoxy / NSF – Two coats		x	x				
4.	Epoxy – Three coats	x	x	x				
5.	Epoxy / NSF – Three coats	x	x	x				
6.	Epoxy – First coat Aliphatic polyurethane – Finish coat	x	x	x	x	x		x
7.	Epoxy – First and second coat Aliphatic polyurethane – Finish coat	x	x	x	x	x		
8.	Universal primer – First coat Aliphatic polyurethane – Finish coat	x		x				
9.	Medium consistency coal tar – Two coats	x	x	x				
10.	Coal tar epoxy – Two coats	x	x	x				
11.	Vinyl ester – Two coats	x	x	x				
12.	Heat resistant – Two coats						x	

No.	Finish Coating Systems	Coating Surface Designation						
		A	C	E	F	G	H	P
13.	High heat resistant – Two coats						x	
14.	Zinc primer – First coat Epoxy – Intermediate coat Aliphatic polyurethane – Final coat	x		x				
15.	Flake-filled epoxy	x		x				

3-8.01. Surfaces Not to Be Coated. Unless otherwise specified, the following surfaces shall be left uncoated:

- Exposed aluminum, except ductwork.
- Polished or finished stainless steel. Unfinished stainless steel, except flashings and counter flashings, shall be coated.
- Nickel or chromium.
- Galvanized surfaces, except piping, conduit, ductwork, and other items specifically noted.
- Rubber and plastics, except as specified.
- Exterior concrete.
- Surfaces specified to be factory finished.

3-8.02. Shop Finishing. Items to be shop finished include the following. Shop finishing shall be in accordance with the coating manufacturer's recommendations.

- a. Other surfaces where blast cleaning cannot be or is not recommended to be performed in the field.
- b. Other items as otherwise specified.

3-8.03. Field Coating. Items to be field coated include the following. Field coating shall be in accordance with the field priming schedule, the coating schedule, and the manufacturer's recommendations.

- a. Surfaces not indicated to be shop finished and surfaces where blast cleaning can be performed in the field.
- b. Other items as otherwise specified.

### 3-9. METAL SURFACES COATING SCHEDULE.

<u>Surfaces To Be Coated</u>	<u>Finish Coating System</u>
Non-galvanized and galvanized structural and miscellaneous steel exposed to view or to the elements in exterior locations.	A6
Cast Iron and steel piping above grade exposed to the elements and to view outdoors, including piping to be insulated, valves, fittings, flanges, bolts, supports, and accessories, and galvanized surfaces after proper priming.	A6
Copper pipe and tubing, including fittings and valves.	F1
All metal surfaces, unless otherwise specified, which will be submerged or buried, all or in part, including valves but excluding piping laid in the ground.	E4
Miscellaneous castings, including manhole rings and covers, and manhole steps. (One coat, if not shop coated.)	E2
Cast iron and steel piping in manholes, and similar locations, including valves fittings, flanges, bolts, supports, and accessories.	A4
All metal harness anchorage for buried piping.	A10
Aluminum in contact with concrete.	F1

3-10. CONCRETE AND MASONRY SURFACES COATING SCHEDULE. Not used.

3-11. MISCELLANEOUS SURFACES COATING SCHEDULE. Not used.

3-12. PIPING IDENTIFICATION SCHEDULE. Not used.

End of Section

SURFACE DESCRIPTION	SYSTEM NO. -

SURFACE PREPARATION DESCRIPTION
<input type="checkbox"/> Solvent SSPC-SP1 <input type="checkbox"/> Ferrous Metal Nonimmersion SSPC-SP6 <input type="checkbox"/> Ferrous Metal Immersion <ul style="list-style-type: none"> <li><input type="checkbox"/> SSPC-SP10</li> <li><input type="checkbox"/> SSPC-SP-5</li> </ul> <input type="checkbox"/> Other

COATING	DFT mils	MANUFACTURER AND PRODUCT
First Coat (Primer)		
Second Coat		
Third Coat		
<b>Total System</b>		Not less than minimum thickness specified.

Notes: (Attached if needed.)
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Project:		
Coatings Manufacturer:		Initials _____
Painting Applicator:		Initials _____
<b>BLACK &amp; VEATCH</b>	COATING SYSTEM DATA SHEET	Fig 1-09940



<b>SHOP PRIMED SURFACE DESCRIPTION</b>	<b>SYSTEM NO. -</b>	<b>-F</b>

<b>SURFACE PREPARATION DESCRIPTION</b>
<input type="checkbox"/> Solvent SSPC-SP1 <input type="checkbox"/> Other:

<b>COATING</b>	<b>DFT mils</b>	<b>MANUFACTURER AND PRODUCT</b>
<b>Shop (Primer)</b>		(Identify Product/Type)
<b>Touchup</b>		
<b>Intermediate Coat</b>		
<b>Finish Coat</b>		
<b>Total System</b>		Not less than minimum thickness specified.

Notes: (Attached if needed.)

Project:		
Coatings Manufacturer:		Initials _____
Painting Applicator:		Initials _____
<b>BLACK &amp; VEATCH</b>	<b>COATING SYSTEM DATA SHEET</b>	<b>Fig 2-09940</b>









Section 15010

VALVE INSTALLATION

PART 1 – GENERAL

1-1. SCOPE. This section covers the installation of new valves and actuators purchased by Contractor as part of this Work or purchased by others under the valve specifications. The equipment to be furnished by others for installation by Contractor is identified in the applicable valve schedules.

Cleaning, disinfection, pressure and leakage testing, insulation, and pipe supports are covered in other sections.

The following specification sections are applicable to valves to be installed:

<u>Title</u>	<u>Section</u>
Miscellaneous Ball Valves	15091
AWWA Butterfly Valves	15101
Resilient-Seated Gate Valves	15104

1-2. GENERAL. Equipment installed under this section shall be erected and placed in proper operating condition in full conformity with Drawings, Specifications, engineering data, instructions, and recommendations of the equipment manufacturer, unless exceptions are noted by Engineer.

Any valves and actuators that are identified as being provided by others will be furnished complete for installation by Contractor. Technical specifications under which the equipment will be purchased are available.

1-2.01. Coordination. When manufacturer's field services or installation check services are provided by the valve manufacturer, Contractor shall coordinate the services with the valve manufacturer. Contractor shall give Engineer written notice at least 30 days prior to the need for manufacturer's field services.

Submittals for equipment that will be furnished by others under each procurement contract will be furnished to Contractor upon completion of review by Engineer. Contractor shall review equipment submittals and coordinate with the requirements of the Work and the Contract Documents. Contractor accepts sole responsibility for determining and verifying all quantities, dimensions, and field construction criteria.

Flanged, push-on, and grooved connections to valves including the bolts, nuts, and gaskets are covered in the appropriate pipe specification section. Valve ends shall match piping.

## PART 2 - PRODUCTS

Not Applicable.

## PART 3 - EXECUTION

3-1. INSPECTION. All valves and accessories shall be inspected for damage and cleanliness before being installed. Any material damaged or contaminated in handling on the job shall not be used unless it is repaired and re-cleaned to the original requirements by Contractor. Such material shall be segregated from the clean material and shall be inspected and approved by Owner or his representative before its use.

### 3-2. INSTALLATION.

3-2.01. General. Valves shall be installed with sufficient clearance for proper operation of any external mechanisms, and with sufficient clearance to dismantle the valve for in-place maintenance. Installation shall be in accordance with the valve manufacturer's recommendations.

3-2.02. Installation Checks. When specified in the valve sections, the valve manufacturer will provide installation checks. For installation checks, the manufacturer's field representative will inspect the valve installation immediately following installation by Contractor. The manufacturer's representatives will revisit the site as often as necessary to ensure installation satisfactory to Owner.

Contractor shall perform no work related to the installation or operation of materials or equipment furnished by others without direct observation and guidance of the field representative, unless Engineer and manufacturer furnishing such materials concur otherwise.

3-2.03. AWWA Butterfly Valves. Butterfly valves shall be installed with the shaft horizontal unless otherwise necessary for proper operation or as acceptable to Engineer.

Whenever an actuator must be removed to permit installation of a valve, the actuator shall be promptly reinstalled and shall be inspected and readjusted by a representative of the valve manufacturer.

3-2.04. Check Valves. Not used.

3-2.05. Plug Valves. Not used.

3-2.06. Resilient Seated Gate Valves.

3-2.06.01. Resilient Seated Gate Valves. Valves shall be handled and installed in accordance with the recommendations set forth in the Appendices to ANSI/AWWA C509 and C515 and with the recommendations of the manufacturer.

3-2.07. Air Release and Combination Air Valves. The exhaust from each valve shall be piped to a suitable point acceptable to Engineer. Air release valve exhaust piping leading to a trapped floor drain shall terminate at least 6 inches above the floor.

3-2.08. Hydrants.

3-2.08.01. Yard Hydrants. Not used.

3-2.08.02. Fire Hydrants. Fire hydrants shall be traffic type, dry barrel, conforming to AWWA C502 "Base Valve" design – "Fire Hydrant for Ordinary Waterworks Service" approved by the National Board of Fire Underwriters with Nation Standard Threads. Hydrant shall have a breakable barrel length for 3 foot main cover. Hydrant shall be equipped with 6" bottom hub, inlet strapping lugs, "O" ring seals and an operating stem with a 2-inch solid operation nut. Main valve shall be 5-1/4" and its seat shall have bronze to bronze threads into hydrant shoe. Hydrant shall be oil lubricated. Hydrant shall be dry bonnet type and be provided with a drain outlet for draining when the valve is closed.

Fire hydrants shall be set so that at least the minimum pipe cover is provided for the branch supply line and the nozzles are at least 12 inches above finished grade. Each hydrant shall be set on a concrete foundation at least 18 inches square and 6 inches thick. Each hydrant shall be blocked against the end of the trench with concrete or shall be suitably anchored.

Hydrant drainage shall be provided by installing at least 7 cubic feet of gravel or crushed stone around the hydrant and below the top of the hydrant supply pipe.

All hydrants shall stand plumb. Hydrants with pumper nozzles shall have hose nozzles parallel with, and the pumper nozzle perpendicular to, the curb line. Hydrants having hose nozzles 90 degrees apart shall be set so that the line bisecting the angle between the nozzles is perpendicular to the curb line. Hydrants located behind curbs, where sidewalks extend close to or abut the curb, shall be set so that no portion of the pumper or hose nozzle caps will be less

than 6 inches or more than 12 inches from the gutter face of the curb. Where set between the curb and sidewalk, or between the sidewalk and property line, no portion of the hydrant or nozzle cap shall be within 6 inches of the sidewalk.

Immediately before installation of a fire hydrant, the following procedure shall be followed: (a) the hydrant shall be thoroughly inspected; (b) the hydrant interior shall be thoroughly cleaned; and (c) the hydrant shall be opened and closed as many times as may be necessary to determine if all parts are in proper working order, with valves seating properly and the drain valve operating freely.

3-2.09. Valve Boxes. Valve boxes shall be set plumb. Each valve box shall be placed directly over the valve it serves, with the top of the box brought flush with the finished grade. After each valve box is placed in proper position, earth fill shall be placed and thoroughly tamped around the box.

3-3. VALVE ACTUATORS. Valve actuators and accessories shall be factory mounted on the valve, calibrated, and tested by the valve or actuator manufacturer.

#### 3-4. FIELD QUALITY CONTROL.

3.4.01. Field Testing. After installation, all valves shall be tested in accordance with the Pipeline Pressure and Leakage Testing section.

3-4.01.01. Pressure Tests. Pressure testing shall be in accordance with the Pipeline Pressure and Leakage Testing section.

3-4.01.02. Leakage Tests. All valves shall be free from leaks. Each leak that is discovered within the correction period stipulated in the General Conditions shall be repaired by and at the expense of Contractor. This requirement applies whether pressure testing is required or not.

3-5. ADJUSTING. Not used.

End of Section

Section 15020

MISCELLANEOUS PIPING AND ACCESSORIES INSTALLATION

PART 1 - GENERAL

1-1. SCOPE. This section covers the installation of piping and accessories as indicated on the Drawings for the following piping sections:

<u>Section Title</u>	<u>Section</u>
Ductile Iron Pipe	15061
Stainless Steel Pipe and Alloy Pipe, Tubing and Accessories	15064
Copper Tubing and Accessories	15070

Contractor shall furnish all necessary jointing materials, coatings, and accessories that are specified herein.

Pipe trenching and backfilling are covered in the Trenching and Backfilling section.

1-2. GENERAL.

1-2.01. Coordination. Materials installed under this section shall be installed in full conformity with Drawings, Specifications, engineering data, instructions, and recommendations of the manufacturer, unless exceptions are noted by Engineer.

1-3. SUBMITTALS.

1-3.01. Drawings and Data. Complete specifications, data, and catalog cuts or drawings shall be submitted in accordance with the Submittals Procedures section. Items requiring submittals shall include, but not be limited to, the following:

Materials as specified herein.

1-3.02. Welder Certification. Prior to the start of the work, Contractor shall submit a list of the welders he proposes using and the type of welding for which each has been qualified. Copy of certification and identification stamp shall be submitted for each welder. Qualification tests may be waived if evidence of prior qualification is deemed suitable by Engineer.

1-3.03. Spool Drawings. Not Used

#### 1-4. QUALITY ASSURANCE.

1-4.01. Welding and Brazing Qualifications. All welding and brazing procedures and operators shall be qualified by an independent testing laboratory in accordance with the applicable provisions of Section IX of the ASME Code. All procedure and operator qualifications shall be submitted to the Engineer for review.

1-4.02. Tolerances. These tolerances apply to in-line items and connections for other lines.

The general dimension, such as face-to-face, face or end-to-end, face- or end-to-center, and center-to-center shall be 1/8 inch.

The inclination of flange face from true in any direction shall not exceed 3/64 inch per foot.

Rotation of flange bolt holes shall not exceed 1/16 inch.

1-5. DELIVERY, STORAGE, AND HANDLING. Shipping shall be in accordance with the Product Delivery Requirements section. Handling and storage shall be in accordance with the Product Storage and Handling Requirements section. All materials shall be stored in a sheltered location above the ground, separated by type, and shall be supported to prevent sagging or bending.

1-5.01. Coated Pipe. Handling methods and equipment used shall prevent damage to the protective coating and shall include the use of end hooks, padded calipers, and nylon or similar fabric slings with spreader bars. Bare cables, chains, or metal bars shall not be used. Coated pipe shall be stored off the ground on wide, padded skids. Plastic-coated pipe shall be covered or otherwise protected from exposure to sunlight.

### PART 2 - PRODUCTS

2-1. SERVICE CONDITIONS. Pipe, tubing, and fittings covered herein shall be installed in the services indicated in the various pipe sections.

#### 2-2. MATERIALS.

Threaded Fittings



Anti-Seize Thread Lubricant	Jet-Lube "Nikal", John Crane "Thred Gard Nickel", Never-Seez "Pure Nickel Special", or Permatex "Nickel Anti-Seize".
Teflon Thread Sealer	Paste type; Hercules "Real-tuff", John Crane "JC-30", or Permatex "Thread Sealant with Teflon".
Teflon Thread Tape	Hercules "Tape Dope" or John Crane "Thread-Tape".
<b>Solder or Brazed Fittings</b>	
Solder	Solid wire, ASTM B32, ANSI/NSF 61 certified, Alloy Grade Sb5, (95-5).
Soldering Flux	Paste type, ASTM B813.
Brazing Filler Metal	AWS A5.8, BCuP-5; Engelhard "Silvaloy 15", Goldsmith "GB-15", or Handy & Harman "Sil-Fos".
Brazing Flux	Paste type, Fed Spec O-F-499, Type B.
<b>Insulating Fittings</b>	
Threaded	Dielectric steel pipe nipple, ASTM A53, Schedule 40, polypropylene lined, zinc plated; Perfection Corp. "Clearflow Fittings".
Flanged`	EpcO "Dielectric Flange Unions" or Central Plastics "Insulating Flange Unions".
<b>Watertight/Dust-tight Pipe Sleeves</b>	
Pipe Sleeve Sealant	O-Z Electrical Manufacturing "Thruwall" and "Floor Seals", or Thunderline "Link-Seals"; with modular rubber sealing elements, nonmetallic pressure plates, and galvanized bolts.
<b>Protective Coatings</b>	

Tape Wrap	ANSI/AWWA C209, except single ply tape thickness shall not be less than 30 mils; Protecto Wrap "200" or Tapecoat "CT".
Primer	As recommended by the tape manufacturer.
Coal Tar Epoxy	High-build coal tar epoxy; PPG Amercoat "Amercoat 78HB Coal Tar Epoxy", Carboline "Bitumastic 300 M", Tnemec "46H-413 Hi-Build Tneme-Tar", or Sherwin-Williams "Hi-Mil Sher-Tar Epoxy".

### PART 3 - EXECUTION

3-1. INSPECTION. All piping components shall be inspected for damage and cleanliness before being installed. Any material damaged or contaminated in handling on the job shall not be used unless it is repaired and recleaned to the original requirements by Contractor. Such material shall be segregated from the clean material and shall be inspected and approved by Owner or his representative before its use.

### 3-2. PREPARATION.

3-2.01. Field Measurement. Pipe shall be cut to measurements taken at the site, not from the Drawings. All necessary provisions shall be made in laying out piping to allow for expansion and contraction. Piping shall not obstruct openings or passageways. Pipes shall be held free of contact with building construction to avoid transmission of noise resulting from expansion.

### 3-3. INSTALLATION.

3-3.01. General. All instruments and specialty items shall be installed according to the manufacturer's instructions and with sufficient clearance and access for ease of operation and maintenance.

Flat faced wrenches and vises shall be used for copper tubing systems. Pipe wrenches and vises with toothed jaws will damage copper materials and shall not be used. Bends in soft temper tubing shall be shaped with bending tools.

3-3.02. Pipe Sleeves. Not Used.

3-3.03. Pipe Joints. Pipe joints shall be carefully and neatly made in accordance with the indicated requirements.

3-3.03.01. Threaded. Pipe threads shall conform to ANSI/ASME B1.20.1, NPT, and shall be fully and cleanly cut with sharp dies. Not more than three threads at each pipe connection shall remain exposed after installation. Ends of pipe shall be reamed after threading and before assembly to remove all burrs. Unless otherwise indicated, threaded joints shall be made up with teflon thread tape, thread sealer, or a suitable joint compound.

Threaded joints in plastic piping shall be made up with teflon thread tape applied to all male threads. Threaded joints in stainless steel piping shall be made up with teflon thread sealer and teflon thread tape applied to all male threads. Threaded joints in steel piping for chlorine service shall be made up with teflon thread tape or litharge and glycerine paste applied to all male threads.

3-3.03.02. Compression. Ends of tubing shall be cut square and all burrs shall be removed. The tubing end shall be fully inserted into the compression fitting and the nut shall be tightened not less than 1-1/4 turns and not more than 1-1/2 turns past fingertight, or as recommended by the fitting manufacturer, to produce a leaktight, torque-free connection.

3-3.03.03. Flared. Not Used.

3-3.03.04. Soldered and Brazed. Not Used.

3-3.03.05. Solvent Welded. Not Used.

3-3.03.06. Epoxy and Adhesive Bonded. Not Used.

3-3.03.07. Heat Fusion Bonded. Not Used.

3-3.03.08. Flanged. Flange bolts shall be tightened sufficiently to slightly compress the gasket and effect a seal, but shall not be torqued less than the minimum value required by the gasket manufacturer. Flange bolts shall not be so tight as to fracture or distort the flanges. A plain washer shall be installed under the head and nut of bolts connecting plastic pipe flanges. Anti-seize thread lubricant shall be applied to the threaded portion of all stainless steel bolts during assembly.

Flange bolt holes shall be oriented as follows, unless otherwise indicated on the spool drawings:

Vertical flange face:	Bolt holes to straddle the vertical centerlines.
Horizontal flange face:	Bolt holes shall be aligned with connecting pipe.

Pipe sealants, thread compounds, or other coatings shall not be applied to flange gaskets unless recommended by the gasket manufacturer for the specified service and approved by Engineer.

Flat-faced flanges shall be used when mating to Class 125 flanges. Full-face gaskets shall be used with flat-faced flanges and ring gaskets shall be used with raised faced flanges.

3-3.03.09. Welded. Welding shall conform to the specifications and recommendations contained in the "Code for Pressure Piping", ANSI B31.1.

Weld cross-sections shall be equal to or greater than the pipe wall thickness. Welds shall be smooth and continuous and shall have interior projections no greater than 1/16 inch. Backing strips or rings shall not be used except with specific prior review by Engineer as to use, material, and design. Root gap inserts that are completely melted and consumed in the weld bead are acceptable only when reviewed in advance by Engineer.

Stainless steel welding shall be inert gas tungsten arc (TIG) or the direct current, straight polarity, inert gas metal arc process (MIG).

3-3.03.10. Grooved Couplings. Not Used.

3-3.03.11. Push-on. Gasket installation and other jointing procedures shall be in accordance with the recommendations of the manufacturer. Each spigot end shall be suitably beveled to facilitate assembly. All joint surfaces shall be lubricated with a heavy vegetable soap solution immediately before the joint is completed. Lubricant shall be suitable for use in potable water, shall be stored in closed containers, and shall be kept clean.

3-3.03.12. Rubber-Gasketed. Not Used.

3-3.03.13. Other Pipe Joints. Not Used.

3-3.04. Pipe. Pipe shall be installed as specified, as indicated on the Drawings, or, in the absence of detail piping arrangement, in a manner acceptable to Engineer.

Piping shall be installed without springing or forcing the pipe in a manner which would induce stresses in the pipe, valves, or connecting equipment.

Piping shall be supported in conformance with the Pipe Supports section.

Piping shall be connected to equipment by flanges or unions as specified in the various piping sections. Piping connecting to equipment shall be supported by a pipe support and not by the equipment.

Water, gas, and air supply piping shall be provided with a shutoff valve and union at each fixture or unit of equipment, whether or not indicated on the Drawings, to permit isolation and disconnection of each item without disturbing the remainder of the system.

A union shall be provided within 2 feet of each threaded-end valve unless there are other connections which will permit easy removal of the valve. Unions shall also be provided in piping adjacent to devices or equipment which may require removal in the future and where required by the Drawings or the Specifications.

In all piping, insulating fittings shall be provided to prevent contact of dissimilar metals, including but not limited to, contact of copper, brass, or bronze pipe, tubing, fittings, valves, or appurtenances, or stainless steel pipe, tubing, fittings, valves, or appurtenances with iron or steel pipe, fittings, valves, or appurtenances. Insulating fittings shall also be provided to prevent contact of copper, brass, or bronze pipe, tubing, fittings, valves or appurtenances with stainless steel pipe, tubing, fittings, valves, or appurtenances.

Branch connections in horizontal runs of steam, air, and gas piping shall be made from the top of the pipe.

Drains required for operation are shown on the Drawings. However, vents at all high points and drains at all low points in the piping that are required for complete draining for pressure test may not be shown on these Drawings. Contractor shall add such items as found to be necessary during detail piping design and/or piping installation.

3-3.05. Reducers. Not used.

3-3.06. Valves. Isolation valves provided with equipment and instruments shall be located in a manner which will allow ease of access and removal of the items to be isolated. Prior to soldering or brazing valves, teflon and elastomer seats and seals shall be removed to prevent damage.

#### 3-4. PIPING ASSEMBLY.

3-4.01. General. Contractor shall only use labor that has been qualified by training and experience to capably perform the specified activities required to accomplish the work in a satisfactory manner

Any deviations from the Specifications or piping locations shown on the Drawings require prior review and approval by Engineer.

3-4.02. Buttwelded Piping. Not Used.

3-5. PROTECTIVE COATING. Not Used.

3-6. PRESSURE AND LEAKAGE TESTING. All specified tests shall be made by and at the expense of Contractor in the presence, and to the satisfaction of Engineer. Each piping system shall be tested for at least 1 hour with no loss of pressure. The Contractor shall coordinate this section with the Pipeline Pressure and Leakage Testing section.

3-6.01. Air Pressure Tests. Not used.

3-7. CLEANING. The interior of all pipe, valves, and fittings shall be smooth, clean, and free of blisters, loose mill scale, sand, dirt, and other foreign matter when installed. Before being placed in service, the interior of all lines shall be thoroughly cleaned, to the satisfaction of Engineer.

3-8. ACCEPTANCE. Owner reserves the right to have any section of the piping system which he suspects may be faulty cut out of the system by Contractor for inspection and testing. Should the joint prove to be sound, Owner will reimburse Contractor on a time-and-material basis as specified in the Contract. Should the joint prove to be faulty, the destructive test will continue joint by joint in all directions until sound joints are found. Costs for replacement of faulty work and/or materials shall be the responsibility of Contractor.

End of Section

Section 15061

DUCTILE IRON PIPE

PART 1 - GENERAL

1-1. SCOPE. This section covers the furnishing and installation of ductile iron pipe. Ductile iron pipe shall be furnished complete with all fittings, specials, adapters, closure pieces, blowoffs, outlets, caps and plugs, temporary bulkheads, access manholes, jointing materials, pipe hangers and supports, anchors, blocking, encasement, appurtenances, and accessories specified and indicated on the Drawings, and as required for proper installation and functioning of the piping.

Piping furnished hereunder shall be complete with all joint gaskets, bolts, nuts and other jointing materials required for installation of any valves and equipment furnished by Owner or others for installation under this Contract.

Pipe hangers and supports, pressure and leakage testing, cathodic protection, and cleaning and disinfection are covered in other sections. Pipe trenching, embedment, and backfill are covered in the Trenching and Backfilling section.

1-2. GOVERNING STANDARDS. Except as modified or supplemented herein, all ductile iron pipe, fittings, and specials shall conform to the applicable requirements of the following standards and other standards named in this section:

ANSI/AWWA Standards	Title
C151	Ductile-Iron Pipe, Centrifugally Cast, For Water
C600	Installation of Ductile Iron Water Mains and Their Appurtenances
M41	Ductile Iron Pipe and Fittings - Manual of Water Supply Practices
C104	Cement Mortar Lining for Ductile Iron Pipe and Fittings
C105	Polyethylene Encasement for Ductile Iron Pipe Systems
C110	Ductile-Iron and Gray-Iron Fittings
C111	Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings





water are ANSI/NSF 61 approved.

Certification of proof-of-design tests for joints, including restrained joints.

Certification of proof-of-design tests for welded-on outlets and experience documentation. Air test documentation for the welded-on outlets used for this project.

Ground Elevation and Utility Locations:

- (a) Prior to preparation of the pipe laying schedule, Contractor shall verify the existing ground elevation and the location and depth of all underground utilities using centerline stakes set at no more than 100 feet intervals. Contractor shall carefully locate and excavate utility, survey, document, and submit this information to the Engineer.

Pipe laying schedule complete with a sequence of laying and an explanation of all abbreviations used in the schedule. For long, straight pipe runs, the pipe laying schedule shall list the pipeline station and either the pipe centerline or invert elevation coordinated with the Drawings at least every 100 feet.

The annotated laying schedule showing all changes made during construction shall be submitted upon completion of the installation of the pipeline.

Two samples of the polyethylene encasement, each sample clearly identified as required by the Governing Standards and test results from an independent third party laboratory of the requirements specified in ANSI/AWWA C105/A21.5.

The method that the Contractor proposes to use for measuring deflection of pipe joints.

Submittal data shall clearly indicate the country of origin of pipe, fittings, flanges, restraining devices, and accessories. When requested by Engineer, certified copies of physical and chemical test results as outlined in ANSI/AWWA C151/A21.51 shall be submitted for the materials to be provided.

1-4.01. Emergency Repair Manual. Not used.

1-4.02. Pre-Submittal Meeting. Prior to the initial pipe submittal, a pre-submittal meeting will be held at a mutually agreed time and place. The meeting shall be attended by:

Representatives of Owner.

Contractor and Contractor's superintendent.

Representatives of Engineers.

Contractor shall bring to the meeting a preliminary schedule for the following:

Pipe installation sequencing.

Pipe fabrication and delivery.

Pipe shop drawings and data submittals as set forth in the Submittals Procedures section.

The purpose of the meeting is to review the preliminary schedules and submittal data requirements, to discuss the fabrication and delivery schedules, to review development of the pipe manufacturer's pipe laying schedule, to establish the timing and coordination of the Owner's inspection at the fabrication facilities, and to establish procedure and coordinate efforts associated with the pipe submittals.

1-5. SPARE MATERIALS. Not Used

1-6. SHIPPING, HANDLING, AND STORAGE. Shipping shall be in accordance with the Product Delivery Requirements section. Handling and storage shall be in accordance with the Product Storage and Handling Requirements section, and as specified herein.

Pipe, fittings, and accessories shall be handled in a manner that will ensure installation in sound, undamaged condition. Equipment, tools, and methods used in handling and installing pipe and fittings shall not damage the pipe and fittings. Hooks inserted in ends of pipe shall have broad, well-padded contact surfaces. Unpadded hooks, wire brushes or other abrasive tools shall not be permitted to come into contact with polyethylene lining if such lining is specified.

Contractor-furnished pipe and fittings in which the lining has been damaged shall be replaced by and at the expense of Contractor. With the concurrence of Engineer, small and readily accessible damaged areas may be repaired. Contractor shall repair any damage to pipe coatings and linings before the pipe is installed.



**Gaskets – All Joint Types** Synthetic rubber unless otherwise specified; natural rubber will not be acceptable. All gaskets shall be furnished by the pipe manufacturer unless another manufacturer's product is indicated. Pipe manufacturer shall submit certificates of gasket suitability certifying that the gasket materials are compatible with the joints specified, are recommended for the specified field test pressure and service conditions. Gaskets for treated or potable water service shall be certified for chlorinated and chloraminated potable water. Gas and oil-resistant gaskets shall be made of Nitrile (NBR [Acrylonitrile Butadiene]) rubber. The name of the material shall be permanently marked or molded on the gasket. Gaskets shall also be certified as suitable where soils may be contaminated with gas and oil products.

**Joint Lubricant** Vegetable-based lubricant recommended by the pipe manufacturer. Petroleum or animal-based lubricants will not be acceptable. Lubricants that will be in contact with treated or potable water shall be certified as being in compliance with ANSI/NSF 61.

**Fittings** ANSI/AWWA C110/A21.10 (except shorter laying lengths will be acceptable for U.S. Pipe), or ANSI/AWWA C153/A21.53, minimum working pressure rating as follows, unless indicated otherwise on the Drawings.

<u>Fitting Size</u> in.	<u>Material</u>	<u>Type</u>	<u>Min. Working Pressure Rating, psi</u>
4 to 24	DI	Mechanical and Push-on joints	350
4 to 24	DI	Flanged joints	250
30 to 48	DI	All joints	250

All fittings shall be ductile iron and suitable for the rated working pressure plus a surge or test pressure allowance of 100 psi or 1.5 times rated working pressure, whichever is less, without leakage or damage.

Push-on Joints	ANSI/AWWA C111/A21.11.
Restrained Push-on Joints, gaskets with stainless steel gripping segments, (4 inch through 12 inch), working pressure rating 350 psi.	American "Fast Grip". U.S. Pipe "Field Lok 350 Gasket" or McWane Sure Stop 350 Gasket.
Restrained Push-on Joints, locking wedge type, (4 inch through 24 inch), working pressure rating 350 psi.	EBAA Iron "Megalug" Series 1700; U.S. Pipe "TR Flex Gripper Ring"; Star Pipe Products "StarGrip 3100P"; or American "Field Flex Ring", without exception.
Restrained Push-on Joints, positive locking segments and/or rings, (4 inch through 24 inch), working pressure rating 350 psi.	American "Flex-Ring,"; U.S. Pipe or McWane "TR Flex"
Restrained Push-on Joints, positive locking segments and/or rings, (30 inch through 48 inch), working pressure rating at least 250 psi.	American "Flex-Ring," or "Lok-Ring"; U.S. Pipe or McWane "TR Flex"; U.S. Pipe "HP LOK."
Field Adaptable Restrained Push-on Joints, (Where approved by Engineer due to unforeseen field conditions), (30 inch through 48 inch), working pressure rating at least 250 psi.	American "Field Flex-Ring" or U.S. Pipe or McWane "TR Flex Gripper Ring"

Restrained push-on joints shall be suitable for a test or working pressure plus surge pressure of the rated working pressure plus 100 psi

Flanged Joints	ANSI/AWWA C115/A21.15.
Flanges	
Class 250	
(Where identified on the Drawings)	Ductile iron, flat faced, with ANSI/ASME B16.1, Class 250 diameter and drilling.

	ASTM A307 chamfered or rounded ends projecting 1/4 to 1/2 inch beyond outer face of nut.
	ASTM A563, hexagonal, ANSI/ASME B18.2.2, heavy semifinished pattern.
	ASTM D1330, Grade I rubber, full face type, 1/8 inch thick unless otherwise required by pipe manufacturer and accepted by Engineer. Pipe manufacturer shall submit certification of gaskets furnished as indicated above under Gaskets - All Joint Types.
Insulated Flanges	
Flanges	As specified herein, except bolt holes shall be enlarged as needed to accept bolt insulating sleeves.
Insulation Kits	As manufactured by Advanced Products or Pipeline Seal and Insulator, Inc.
Insulating Gaskets	Type E, G-10, 1/8 inch thick, with Nitrile or EPDM sealing element for water and air service and Viton sealing elements for wastewater service unless otherwise required by pipe manufacturer and accepted by Engineer. Pipe manufacturer shall submit certification of gaskets furnished as indicated above under Gaskets - All Joint Types.
Bolt Insulating Sleeves	G-10, 1/32 inch thick.
Insulating Washers	G-10, 1/8 inch thick, two for each flange bolt.
Backing Washers	Steel, 1/8 inch thick, two for each flange bolt.
Mechanical Joints	ANSI/AWWA C111/A21.11., with ductile iron glands.

Restrained Mechanical Joints (factory prepared spigot), (4 inch through 48 inch), working pressure rating at least 250 psi.

American "MJ coupled Joints", or Griffin "Mech-Lok".

Restrained Mechanical Joints, (field cut spigot), (4 inch through 24 inch), working pressure rating 250 psi

EBAA Iron "Megalug" Series 1100, Sigma "One Lok" SLDE series, or Star Pipe Products "StarGrip 3000" without exception.

Restrained mechanical joints shall be suitable for a test or working pressure plus surge pressure of the rated working pressure plus 100 psi

Wall Pipes or Castings

Mechanical joint with water stop and tapped holes; single casting or fabricated ductile iron pipe; holes sized in accordance with the details on the Drawings and provided with removable plugs.

Mechanical Joints with Tie Rods

As indicated on the Drawings.

Tie Rods

ASTM A307.

Steel Pipe

ASTM A53, Schedule 40 or 80 as indicated on the Drawings.

Washers

ANSI/ASME B18.22.1, plain steel.

Threaded Connections

ANSI/ASME B1.20.1, NPT; with boss or tapping saddle wherever wall thickness minus the foundry tolerance at the tapped connection is less than that required for 4-thread engagement as set forth in Table A.1, Appendix A, of ANSI/AWWA C151/A21.51.

Mechanical Couplings

Couplings

Dresser "Style 38"; Smith-Blair "411 Steel Coupling"; or Romac "Style 400" or "Style 501"; without pipe stop.

Gaskets	Oil-resistant synthetic rubber gaskets shall be as recommended by the coupling manufacturer. Pipe manufacturer shall submit certification of gaskets furnished as indicated above under Gaskets - All Joint Types.
Restrained Mechanical Couplings	American Pipe "Restrained Coupling Gland Joint" coordinated with mechanical couplings furnished.
Tapping Saddles	Ductile iron, with stainless steel straps and synthetic rubber sealing gasket, 250 psi pressure rating.
Watertight/Dusttight Pipe Sleeves	PSI "Thunderline Link-Seal", insulating type with modular rubber sealing elements, nonmetallic pressure plates, and stainless steel bolts and nuts.
Shop Coating and Lining	
Cement Mortar Lining with Seal Coat	ANSI/AWWA C104/A21.4.
Protective Fusion-Bonded Ceramic Epoxy Lining	ANSI/AWWA C116/A21.16. Induron "Protecto 401 Ceramic Epoxy".
Universal Primer	Manufacturer's standard. If in contact with treated or potable water, certify as being in compliance with ANSI/NSF 61.
Asphaltic Coating	Manufacturer's standard.
Coal Tar Epoxy	Manufacturer's standard.
Anti-Seize Thread Lubricant	Jet-Lube "Nikal", John Crane "Thred Gard Nickel", Bostik/Never-Seez "Pure Nickel Special" or Permatex "Nickel Anti-Seize".
Corrosion Protection	
Polyethylene Encasement	Seamless, ANSI/AWWA C105/A21.5; LLDPE - 8 mil or HDCLPE - 4 mil.



Heat-shrinkable Coating and Primer (Shrink Sleeve)	ANIS/AWWA C216, cross-linked polyethylene sheeting precoated with adhesive; minimum 80 mils; type and recovery as recommended by Shrink Sleeve manufacturer; Canusa-CPS or Berry Plastics Water Wrap.
Wax Tape and Primer	ANSI/AWWA C217, cold-applied petroleum wax primer and cold-applied petroleum wax tape; Trenton Wax-Tape and Primer.
Medium Consistency Coal Tar	Carboline "Bitumastic 50" or Tnemec "46-465 H.B. Tnemecol."

2-3. OUTLETS. Where a 12 inch or smaller branch outlet is indicated and the diameter of the parent pipe is at least twice the diameter of the branch, a tee, a factory welded-on boss, or a tapping saddle will be acceptable.

Where a 4 inch or larger branch outlet is indicated on the Drawings and the diameter of the branch pipe for a given diameter of parent pipe is less than or equal to the maximum diameter listed herein, a factory welded-on outlet fabricated from centrifugally cast ductile iron pipe will be acceptable.

Parent Pipe Diameter Versus Maximum Branch Pipe Diameter for Welded-On Outlets

Parent Pipe Dia inches	Max Branch Pipe Dia inches	Parent Pipe Dia inches	Max Branch Pipe Dia inches
8	4	30	20
10	6	36	24
12	8	42	30
14	8	48	30
16	10	54	36
18	12	60	36
20	14	64	36
24	16		

All 30 inch and smaller branch pipe diameter welded-on outlets shall be rated for a working pressure of 250 psi, 36 inch branch diameter welded-on outlets shall be rated for a working pressure of 200 psi, and all outlets shall have a minimum

factor of safety of 2.0. The pipe manufacturer shall provide test data and certification of proof of design. It is not necessary that these tests be performed on pipe manufactured specifically for this project. Certified reports covering tests made on other pipe of the same size and design as specified herein and manufactured from materials of equivalent type and quality may be accepted as adequate proof of design.

Welded-on outlets may be provided as a radial (tee) outlet, a tangential outlet, or a lateral outlet fabricated at a specific angle to the parent pipe (in 15 degree increments between 45 degrees and 90 degrees from the axis of the parent pipe), as indicated on the Drawings. The fillet weld dimensions for welded-on outlets shall be as specified herein. Parent pipe and branch pipe shall meet hydrostatic test requirements in accordance with ANSI/AWWA C151/A21.51 prior to fabrication.

Welded-on Outlet Fillet Weld Dimensions for Specified Outlet Configurations

Radial and Lateral Outlets			Tangential Outlets		
<u>Parent Pipe Dia</u> inches	<u>Branch Pipe Dia</u> inches	<u>Weld Fillet Size</u> inches	<u>Parent Pipe Dia</u> inches	<u>Branch Pipe Dia</u> inches	<u>Weld Fillet Size</u> inches
24 and smaller	24 and smaller	1 x 1	8-30	24 and smaller	1-1/4 x 1-1/4

All joints on welded-on branch outlets shall be made in accordance with the latest revision of ANSI/AWWA C111/A21.11 and/or ANSI/AWWA C115/A21.15, as applicable. All outlets shall be fabricated from centrifugally cast ductile iron pipe designed in accordance with ANSI/AWWA C150/A21.50 and manufactured and tested in accordance with ANSI/AWWA C151/A21.51. Ni-Rod FC 55<sup>®</sup> electrodes manufactured by International Nickel Corporation (or an electrode with equivalent properties) shall be used in the manufacture of the fillet welds. Carbon steel electrodes will not be acceptable. Special Thickness Class 53 pipe shall be used for all branch pipe and parent pipe in 4 to 54 inch sizes. Pressure Class 350 pipe shall be used for 60 inch and 64 parent pipe. After welding, each fabricated outlet shall be subjected to a 15 psi air test. A soap and water solution shall be applied during the testing procedure to inspect the weld for leakage. Any welds that show air seepage shall be refabricated and retested.

Welded-on outlets shall be fabricated by the pipe manufacturer at its production facilities. Manufacturers of welded-on outlets shall have at least 5 years of satisfactory experience in the manufacture and performance of these products. The manufacturer shall have a documented welding quality assurance system and shall maintain resident quality assurance records based on ANSI/AWS

D11.2, the Guide for Welding Iron Castings. The manufacturer shall also maintain appropriate welding procedure specifications (WPS) and procedure qualification (PQR), and welder performance qualification (WPQR) records.

The type of pipe end for the branch outlet shall be as specified or indicated on the Drawings. The maximum size and laying length of the welded-on branch outlet shall be as recommended by the pipe manufacturer and shall be acceptable to Engineer for the field conditions and the connecting pipe or valve.

At locations acceptable to Engineer, drilling and tapping of the pipe wall for 2 inch and smaller pipe connections will also be acceptable, provided that the wall thickness, minus the casting allowance, at the point of connection equals or exceeds the wall thickness required for 4-thread engagement in accordance with Table A.1, Appendix A of ANSI/AWWA C151/A21.51.

2-4. JOINTS. Joints in buried and tunnel locations shall be mechanical or push-on type unless otherwise indicated on the Drawings or where required to connect to existing piping or to valves. Bells on wall castings and wall sleeves shall be mechanical joint type, with tapped holes for tie rods or stud bolts. All other joints shall be flanged unless otherwise indicated on the Drawings.

Certification of joint design shall be provided in accordance with ANSI/AWWA C111/A21.11, Performance Requirements, as modified herein. The joint test pressure shall be not less than 2 times the working pressure rating of the joint. The same certification and testing shall also be provided for restrained joints. For restrained joints, the piping shall not be blocked to prevent separation and the joint shall not leak or show evidence of failure. It is not necessary that such tests be made on pipe manufactured specifically for this project. Certified reports covering tests made on other pipe of the same size and design as specified herein and manufactured from materials of equivalent type and quality may be accepted as adequate proof of design. Any new proof-of-design testing to meet the requirements for this project shall be independently verified and the Owner shall be given the opportunity to witness the testing.

Unless otherwise indicated on the drawings or acceptable to the Engineer, field closure pieces shall be located away from the bends or dead ends beyond the length over which joints are to be restrained.

The length of pipe having restrained joints shall be as indicated on the drawings or specified. All vertical bends and eccentric reducers shall have restrained joints.

Where acceptable to Engineer, grooved couplings may be used instead of flanges, provided that rigid grooving is used to preclude longitudinal pipe

movement and angular deflection at joints. Fittings, valves, and equipment installed using grooved couplings shall be adequately supported and blocked or restrained to prevent rotation.

2-4.01. Flanged Joints. Pipe shall extend completely through screwed-on flanges. The pipe end and flange face shall be finish machined in a single operation. Flange faces shall be flat and perpendicular to the pipe centerline.

2-4.02. Flanged Coupling Adaptors. Not used.

2-4.03. Dismantling Joints. Not used.

2-4.04. Mechanical Couplings. The piping layout for mechanical couplings shall provide a space of at least 1/4 inch, but not more than 1 inch, between the pipe ends.

All surfaces, including the interior surfaces of the middle rings, shall be prepared for coating in accordance with instructions of the coating manufacturer and shall be shop coated with 16 mils liquid epoxy in accordance with ANSI/AWWA C210.

A ductile iron pipe factory spacer shall be provided for the piping where indicated on the drawings. The spacer shall be shop lined and coated with 16 mils of liquid epoxy. Piping surfaces within the coupling shall be shop coated with 16 mils of liquid epoxy.

Tie bolts shall be provided to restrain mechanical coupling connections where indicated on the Drawings. The connecting pipe shall be furnished with welded retainer rings as recommended by pipe manufacturer. The pipe manufacturer shall also coordinate the restrained connection with the pressure rating, length, and diameter dimensions of the mechanical coupling being furnished to assure proper clearance is provided for completing the restrained coupling installation.

2-4.05. Grooved-End Couplings. Not used.

2-5. REDUCERS. Reducers shall be eccentric or concentric as indicated on the Drawings. Reducers of eccentric pattern shall be installed with the straight side on top, so that no air traps are formed.

2-6. BLOWOFFS. Each blowoff shall be located and arranged as indicated on the Drawings.

2-7. ACCESS OPENINGS. Not used.

2-8. WALL AND FLOOR PIPES. Wall and floor pipes shall be installed where ductile iron pipes pass through concrete walls or floors, unless otherwise indicated on the Drawings.

Where a flange and mechanical joint pipe piece is to connect to a mechanical joint wall pipe or casting, the bolt holes in the bell of the wall pipe or casting shall straddle the top centerline of the horizontal pipe or casting and shall align with the bolt holes in the flange and mechanical joint piece. The top centerline shall be marked on the wall pipe or casting at the foundry or fabrication shop.

In vertical piping, the bolt holes of flanged and mechanical joint floor pipes or castings shall be aligned with the bolt holes of the flange or mechanical joint connecting piece. The required centerline alignment and orientation of the floor pipe or casting shall be marked on the floor pipe or casting at the foundry or fabrication shop.

2-9. WALL AND FLOOR SLEEVES. Wall and floor sleeves shall be installed where indicated on the Drawings and shall be installed where ductile iron pipe passes through concrete walls and floors or masonry walls, unless otherwise noted. To minimize sleeve size, piping on either side of the sleeve shall be provided with a screw-on flange, grooved coupling, or mechanical coupling with anchor studs to allow the pipe to pass through the sleeve. Where required, sleeves in masonry walls may be enlarged enough for flange or other joint restraint to pass through the sleeve.

Where specified or indicated on the Drawings, one or two sets of modular casing seals shall be installed at the face of walls to seal against soil or provide a dust or water tight seal. Contractor shall coordinate the diameter of wall or floor sleeves with the modular casing seal manufacturer. When soil may be present at wall sleeves, two sets of modular casing seals shall be installed, one at each face of the wall. Unless otherwise indicated on the Drawings, modular casing seals shall not be used in submerged conditions unless the hydrostatic pressure is less than 20 feet and piping is less than 24 inch size.

2-10. SHOP COATING AND LINING. The interior of all potable water pipe and fittings shall be cement mortar lined and seal coated. Gravity sanitary sewer pipe shall be lined with ceramic epoxy.

Exterior surfaces of all pipe and fittings shall be coated with asphaltic coating.

## PART 3 – EXECUTION

3-1. INSPECTION. Pipe and fittings shall be carefully examined for cracks and other defects immediately before installation; pipe ends shall be examined with particular care. All defective pipe and fittings shall be removed from the site.

3-2. PROTECTION AND CLEANING. The interior of all pipe and fittings shall be thoroughly cleaned of all foreign material prior to installation and shall be kept clean until the work is completed. Before jointing, all joint contact surfaces shall be wire brushed if necessary and wiped clean.

Precautions shall be taken to prevent foreign material from entering the pipe during installation. Debris, tools, clothing, or other objects shall not be placed in or allowed to enter the pipe.

Whenever pipe laying is stopped, the open end of the pipe shall be closed to prevent entry of dirt, mud, rodents, and other material. All water in the trench shall be removed prior to removing the closure.

3-3. CUTTING PIPE. Cutting shall be done in a neat manner, without damage to the pipe or the lining. Cuts shall be smooth, straight, and at right angles to the pipe axis. After cutting, the ends of the pipe shall be dressed with a file or a power grinder to remove all roughness and sharp edges. The cut ends of push-on joint pipe shall be suitably beveled.

All field cutting of existing gray cast iron pipe shall be done with mechanical pipe cutters, except where the use of mechanical cutters would be difficult or impracticable.

Ends of ductile iron pipe shall be cut with a portable guillotine saw, abrasive wheel, saw, milling cutter, or oxyacetylene torch. The use of hydraulic squeeze type cutters will not be acceptable. Field-cut holes for saddles shall be cut with mechanical cutters; oxyacetylene cutting will not be acceptable.

Contractor shall use factory prepared pipe ends unless a field cut is required for connections.

3-4. ALIGNMENT AND GRADE. Buried piping shall be laid to the lines and grades indicated on the Drawings and as specified. Pipelines or runs intended to be straight shall be laid straight. Deflections from a straight line or grade shall not exceed the values stipulated for full-length push-on joint pipe for full-length mechanical joint pipe of AWWA C600, unless specially designed bells and spigots are provided. Contractor shall submit his proposed methods to measure deflection of deflected joints in accordance with the Submittal section.

Whenever deflections would exceed the values stipulated in AWWA C600, either shorter pipe sections or fittings shall be installed where needed to conform to the alignment or grade indicated on the Drawings and as acceptable to the Engineer.

Unless otherwise specified or acceptable to Engineer, laser beam equipment, surveying instruments, or other suitable means shall be used to maintain alignment and grade. At least one elevation reading shall be taken on each length of pipe. If laser beam equipment is used, periodic elevation measurements shall be made with surveying instruments to verify accuracy of grades. If such measurements indicate thermal deflection of the laser beam due to differences between the ground temperature and the air temperature within the pipe, precautions shall be taken to prevent or minimize further thermal deflections.

Additional requirements for alignment and grade are covered in the Project Requirements and Trenching and Backfilling sections and on the Drawings.

3-4.01. Tolerances. Each section of pipe shall be laid to the alignment and grade indicated on the Drawings and pipe laying schedule with pipe ends within the following tolerances;

- +/- 0.10 foot in grade at any point
- +/- 0.20 foot in alignment at any point

In addition, piping shall be visually straight or on a smooth curve between the points of deflection or curvature indicated on the Drawings. Stricter tolerances than specified above shall be used as necessary to maintain minimum cover, to maintain required clearances, to place carrier pipe inside a tunnel liner, to make connections to existing pipe, to maintain the correct slope to avoid high or low points along the pipeline other than at locations indicated on the Drawings, or to meet other restrictions as required or directed by the Engineer.

3-5. LAYING PIPE. Buried pipe shall be protected from lateral displacement by placing the specified pipe embedment material installed as specified in the Trenching and Backfilling section. Under no circumstances shall pipe be laid in water, and no pipe shall be laid under unsuitable weather or trench conditions. Pipe embedment material and trench backfill shall be placed and compacted under and around each side of outlets and fittings to hold the pipe in proper position and alignment during the subsequent pipe jointing, embedment, and backfilling.

Pipe shall be laid with the bell ends facing the direction of laying, except where reverse laying is specifically acceptable to Engineer.

Carrier pipe installation in tunnels shall be as indicated on the Drawings and as specified in the Trenching and Backfilling section. All carrier piping within tunnels shall be restrained throughout and adequately blocked before piping is pressurized to prevent movement. Carrier pipe in tunnels shall be pulled into place to keep the restrained joints extended.

The pipe laying schedule shall be annotated during the progress of the work to show all changes made during construction for record documentation. Upon completion of the installation of the piping, the annotated pipe laying schedule shall be submitted to Engineer in accordance with the Submittals Procedures section.

3-6. JOINTS. Each joint, including restrained joints, shall be checked by Contractor as recommended by the pipe manufacturer to verify that the joint and the restraints are installed properly. Restrained joints shall be extended after they are assembled to minimize further take-up.

3-7. MECHANICAL JOINTS. Mechanical joints shall be carefully assembled in accordance with the pipe manufacturer's recommendations. If effective sealing is not obtained, the joint shall be disassembled, thoroughly cleaned, and reassembled. Bolts shall be uniformly tightened to the torque values listed in Appendix A of ANSI/AWWA C111/A21.11. Over tightening of bolts to compensate for poor installation practice will not be acceptable.

The holes in mechanical joints with tie rods shall be carefully aligned to permit installation of the tie rods. In flange and mechanical joint pieces, holes in the mechanical joint bells and the flanges shall straddle the top centerline for horizontal piping.

3-8. PUSH-ON JOINTS. The pipe manufacturer's instructions and recommendations for proper jointing procedures shall be followed. All joint surfaces shall be lubricated with a soap solution provided by the pipe manufacturer immediately before the joint is completed. Lubricant shall be suitable for use in potable water, shall be stored in closed containers, and shall be kept clean. Each spigot end shall be suitably beveled to facilitate assembly.

Pipe ends for restrained joint pipe shall be prepared in accordance with the pipe manufacturer's recommendations.

3-9. FLANGED JOINTS. When bolting flanged joints, care shall be taken to avoid restraint on the opposite end of the pipe or fitting which would prevent uniform gasket compression or would cause unnecessary stress in the flanges. One flange shall be free to move in any direction while the flange bolts are being tightened. Bolts shall be tightened gradually in a crisscross pattern and at a



uniform rate, to ensure uniform compression of the gasket around the entire flange. All flange joint bolting procedures shall be in accordance with the pipe manufacturer's recommendations.

Special care shall be taken when connecting piping to any pumping equipment to ensure that piping stresses are not transmitted to the pump flanges. All connecting piping shall be permanently supported to obtain accurate matching of bolt holes and uniform contact over the entire surface of flanges before any bolts are installed in the flanges.

3-9.01. Insulated Flanged Joints. Not used.

3-10. FLANGED COUPLING ADAPTERS. Not used.

3-11. DISMANTLING JOINTS. Not used.

3-12. MECHANICAL COUPLINGS. Mechanical couplings shall be installed in accordance with the coupling manufacturer's recommendations. A space of at least 1/4 inch, but not more than 1 inch, shall be left between the pipe ends. Pipe and coupling surfaces in contact with gaskets shall be clean and free from dirt and other foreign matter during assembly. All assembly bolts shall be uniformly tightened so that the coupling is free from leaks, and all parts of the coupling are square and symmetrical with the pipe. Following installation of the coupling, damaged areas of shop coatings on the pipe and coupling shall be repaired to the satisfaction of Engineer.

3-13. GROOVED-END JOINTS. Not used.

3-14. GAS AND OIL-RESISTANT GASKETS. Gas and oil-resistant gaskets shall be installed where specified, indicated on the Drawings, or directed by Engineer where jointing gaskets may be subject to permeation when piping passes through areas where soil may be contaminated with gas or petroleum (oil) products or organic solvents or their vapors.

3-15. CORROSION PROTECTION.

3-15.01. Polyethylene Encasement. Where indicated on the Drawings, buried pipe and pipe installed in tunnels, including all straight pipe, bends, tees, adapters, closure pieces, and other fittings or specials, shall be provided with at least one wrap of polyethylene encasement. Locations where ductile iron pipe and accessories shall be double wrapped with polyethylene encasement shall be as indicated on the Drawings.

Where ductile iron pipe is also embedded or encased in concrete the polyethylene encasement shall be installed around the pipe for 5 feet extending into each end of the concrete encasement, except where ductile iron pipe is encased in concrete under structures. When ductile iron pipe is encased in concrete under structures, the polyethylene encasement shall extend 5 feet into the concrete encasement as measured from the outside edge of slab or footing, unless otherwise indicated on the Drawings.

All buried flanged valves, mechanical joint couplings with tie rods, mechanical couplings, restrained mechanical couplings and other pipe harness assemblies at valves or structure walls shall be provided with two wraps of polyethylene encasement in addition to other corrosion protection coatings as specified herein.

Polyethylene tube protection shall be installed in accordance with ANSI/AWWA C105/A21.5, Method A. Preparation of the pipe shall include, but shall not be limited to, removal of lumps of clay, mud, cinders, etc., prior to installation.

The terms "polyethylene tube protection" and "polyethylene encasement" are interchangeable and shall have the same meaning in these Contract Documents.

3-15.01.01. Inspection and Testing. Tests for preliminary acceptance of polyethylene encasement materials as required in the submittal paragraph shall be made at the expense of the Contractor.

At the Owner's expense, the Owner may obtain samples from the material supplied in the field and have test conducted of the requirements specified in ANSI/AWWA C105/A21.5 by an independent third-party laboratory,

3-15.02. Mechanical Joint Couplings with Tie Rods. The mechanical joint tie rods, bolt studs, pipe spacers and washers of buried mechanical joint couplings as detailed on the Drawings shall be protected by wrapping them with wax tape in accordance with ANSI/AWWA C217. A primer shall be applied prior to applying the wax tape. The application of the wax tape shall be as recommended by the wax tape manufacturer. There shall be no bare or unprotected ferrous metal surfaces.

Following application of the wax tape protection, the entire mechanical joint coupling assembly shall be wrapped with two layers of polyethylene encasement as specified herein. The two wraps of polyethylene encasement shall be lapped a minimum of 12 inches with the polyethylene encasement of the piping on each side of the coupling assembly.

3-15.03. Flanged Joints. The flange bolts and nuts on buried flanges, including valve flanges, shall be protected by wrapping them with wax tape in accordance

with ANSI/AWWA C217. A primer shall be applied prior to applying the wax tape. The application of the wax tape shall be as recommended by the wax tape manufacturer. There shall be no bare or unprotected ferrous metal surfaces.

Following application of the wax tape protection, the entire flanged joint shall be wrapped with two layers of polyethylene encasement as specified herein. The two wraps of polyethylene encasement shall be lapped a minimum of 12 inches with the polyethylene encasement on each side of the joint.

3-15.04. Valves. Buried portions of the valve and the actuator to the wrench nut shall be wrapped with two layers of polyethylene encasement as specified herein. The two wraps of polyethylene encasement shall be lapped a minimum of 12 inches with the polyethylene encasement of the piping on each side of the valve.

3-15.05. Mechanical Couplings. The tie bolts and nuts on all buried mechanical couplings shall be coated with two coats of medium consistency coal tar.

After the protective coating has been applied to the tie bolts, the entire mechanical coupling shall be encapsulated with a shrink sleeve as indicated on the Drawings. The shrink sleeve shall extend a minimum of 6 inches on to the pipe on each side of the coupling. A primer shall be applied to the piping on each side of the coupling prior to installing the shrink sleeve. The application of the shrink sleeve shall be in accordance with ANSI/AWWA C216 and as recommended by the shrink sleeve manufacturer. There shall be no bare or unprotected ferrous metal surfaces. Following installation of the shrink sleeve, the entire assembly shall be encapsulated with two wraps of polyethylene encasement lapped a minimum of 12 inches with the polyethylene encasement of the piping on each side of the assembly as specified herein.

3-15.06. Restrained Mechanical Couplings. The corrosion protection for the mechanical coupling and its tie bolts and nuts of all buried restrained mechanical coupling assemblies shall be protected with two coats of medium consistency coal tar and shrink sleeve as specified herein for buried mechanical couplings. The tie rods and bolts of the coupling assembly shall be protected by wrapping them with wax tap in accordance with ANSI/AWWA C217 and as detailed on the Drawings. A primer shall be applied prior to applying the wax tape. The application of the wax tape shall be as recommended by the wax tape manufacturer. There shall be no bare or unprotected ferrous metal surfaces.

Following the application of the wax tape, the entire restrained mechanical coupling assembly shall be encapsulated with two wraps of polyethylene encasement lapped a minimum of 12 inches with the polyethylene encasement of the piping on each side of the assembly as specified herein.

3-15.07. Other Assemblies. All ferrous metal clamps, tie rods, bolts, and other components of buried joint harnesses, tapping saddles, or pipe reaction anchorages in contact with earth or other fill material and not encased in concrete, shall be protected by wrapping them with wax tape in accordance with ANSI/AWWA C217. A primer shall be applied prior to applying the wax tape. The application of the wax tape shall be as recommended by the wax tape manufacturer. There shall be no bare or unprotected ferrous metal surfaces.

Following the application of the wax tape, the entire assembly shall be encapsulated with two wraps of polyethylene encasement lapped a minimum of 12 inches with the polyethylene encasement of the piping on each side of the assembly as specified herein.

3-15.08. Surfaces Exposed in Manholes and Vaults. Unless otherwise specified, all uncoated surfaces exposed in manholes and vaults shall be cleaned and coated with two coats of medium consistency coal tar. The first coat shall be dry and hard before the second coat is applied. There shall be no unprotected, bare, or uncoated ferrous metal surfaces.

3-16. PROVISIONS FOR CATHODIC PROTECTION SYSTEMS. Not used.

3-17. CONNECTIONS WITH EXISTING PIPING. Connections between new work and existing piping shall be made using fittings suitable for the conditions encountered. Each connection with an existing pipe shall be made at a time and under conditions which will least interfere with service to customers, and as authorized by Owner. Facilities shall be provided for proper dewatering and for disposal of all water removed from dewatered lines and excavations without damage to adjacent property.

Special care shall be taken to prevent contamination when dewatering, cutting into, and making connections with existing potable water piping. Trench water, mud, or other contaminating substances shall not be permitted to enter the lines. The interior of all pipe, fittings, and valves installed in such connections shall be thoroughly cleaned and then all connections with potable water pipelines shall be cleaned and disinfected as specified in the Cleaning and Disinfection of Water Pipelines section.

Special care shall be taken to prevent contamination when dewatering, cutting into, and making connections with existing potable water piping. Trench water, mud, or other contaminating substances shall not be permitted to enter the lines. The interior of all pipe, fittings, and valves installed in such connections shall be thoroughly cleaned and then swabbed with, or dipped in, a 500 mg/L chlorine solution.

3-18. CONCRETE ENCASEMENT. Not used.

3-19. REACTION ANCHORAGE AND BLOCKING. Concrete blocking shall be installed where indicated on the Drawings. Concrete and reinforcing steel shall be as specified in the Cast-in-Place Concrete section.

The blocking size shall be of the dimensions indicated on the Drawings, shall extend from the fitting to solid, undisturbed earth, and shall be installed so that all joints are accessible for repair. If adequate support against undisturbed ground cannot be obtained, restrained joints shall be installed to provide the necessary support. If the lack of suitable solid vertical excavation face is due to improper trench excavation, restrained joints shall be furnished and installed by and at the expense of Contractor.

Reaction blocking, anchorages, or other supports for fittings installed in fills or other unstable ground, installed above grade, or exposed within structures, shall be provided as indicated on the Drawings.

All ferrous metal clamps, rods, bolts, and other components of tapping saddles, reaction anchorages, or joint harness, subject to submergence or in contact with earth or other fill material and not encased in concrete, shall be protected from corrosion as specified in the Corrosion Protection paragraph of this section.

3-20. PRESSURE AND LEAKAGE TESTS. After installation, pipe and fittings shall be subjected to a pressure test and a leakage test in accordance with the Pipeline Pressure and Leakage Testing section.

3-21. CLEANING AND DISINFECTION. The interior of all pipe and fittings shall be thoroughly cleaned before installation and shall be kept clean of any foreign matter until the work has been accepted. All joint contact surfaces shall be kept clean until the joint is completed.

After installation, all potable water pipelines shall be cleaned and disinfected as specified in the Cleaning and Disinfection of Water Pipelines section.

End of Section



Section 15064

STAINLESS STEEL PIPE AND ALLOY PIPE, TUBING, AND ACCESSORIES

PART 1 - GENERAL

1-1. SCOPE. This section covers the furnishing of stainless steel pipe and alloy pipe, tubing and accessories through 24" diameter for the services as indicated herein. Pipe and tubing shall be furnished complete with all fittings, flanges, unions, and other accessories specified herein.

1-2. SUBMITTALS.

1-2.01. Drawings and Data. Complete specifications, data, and catalog cuts or drawings shall be submitted in accordance with the Submittals Procedures section. Submittals are required for all piping, fittings, gaskets, sleeves, and accessories, and shall include the following data:

- Name of Manufacturer
- Type and model
- Construction materials, thickness, and finishes
- Pressure and temperature ratings

Contractor shall obtain and submit a written statement from the gasket material manufacturer certifying that the gasket materials are compatible with the joints specified herein and are recommended for the specified field test pressures and service conditions.

All welding and brazing procedures and operators shall be qualified by an independent testing laboratory in accordance with the applicable provisions of Section IX of the ASME Code. All procedure and operator qualifications shall be in written form and submitted to the Engineer for review.

1-3. DELIVERY, STORAGE, AND HANDLING. Shipping shall be in accordance with the Product Delivery Requirements section. Handling and storage shall be in accordance with the Product Storage and Handling Requirements section. All materials shall be stored in a sheltered location above the ground, separated by type, and shall be supported to prevent sagging or bending.

PART 2 - PRODUCTS

2-1. MATERIALS. Stainless steel pipe and alloy pipe materials shall be as specified herein.

2-1.01. Material Classification SS-1. Not used.

2-1.02. Material Classification SS-2. Not used.

2-1.03. Material Classification SS-3. Not used.

2-1.04. Material Classification SS-4. Not used.

2-1.05. Material Classification SS-5. Not used.

2-1.06. Material Classification SS-6.

SS-6 – Schedule 40S with  
Threaded Ends.

Pipe  
Fittings

ASTM A312, TP304  
TP316.

Gate valve flushing connection  
piping

Threaded, material to  
match pipe. Fittings shall  
conform to  
ANSI/ASME B16.3, Class  
150.

2 inch and smaller.

2-1.07. Material Classification SS-7. Not used.

2-1.08. Material Classification SS-8. Not used.

2-1.09. Material Classification SS-9. Not used.

2-1.10. Material Classification SS-10. Not used.

2-1.11. Material Classification SS-11. Not used.

2-1.12. Material Classification CRP-1. Not used.

2-1.13. Material Classification HST-1. Not used.

2-1.14. Accessory Materials. Accessory materials for the stainless steel pipe systems shall be as indicated. Flanges shall be flat faced for water service and shall be raised face for air or gas service except when connecting to flat face equipment or valve flanges.



## Insulating Fittings

Threaded	Dielectric steel pipe nipple, ASTM A53, Schedule 40, polypropylene lined, zinc plated; Perfection Corp. "Clearflow Fittings".
Flanged	EpcO "Dielectric Flange Unions" or Central Plastics "Insulating Flange Unions".

2-1.14.01. Branch Connections. Not used.

2-2. WELDING OF STAINLESS STEEL AND ALLOYS. Filler metal for welding austenitic stainless steel and alloys, P-number 8 base materials shall be in accordance with the following:

Material Type/Grade 304 shall use Type 308 filler metal.

Material Type/Grade 304L shall use Type 308L filler metal.

Material Type/Grade 316, shall use Type 316 filler metal.

Material Type/Grade 316L shall use Type 316L filler metal.

Material Type/Carpenter 20 shall use Carpenter 20 filler metal.

Material Type/Hastelloy C276 shall use Hastelloy C276 filler metal.

The following requirements shall apply when fabricating austenitic stainless steel and alloy components.

Grinding shall be by aluminum oxide, zirconium oxide, or silicon carbide grinding wheels that shall not have been used on carbon or low alloy steels. Hand or power wire brushing shall be by stainless steel brushes that shall not have been used on carbon or low alloy steels for stainless steel pipe. Hand or power wire brushing shall be by Carpenter 20 brushes that shall not have been used on carbon or low alloy steels for Carpenter 20 pipe. Hand or power wire brushing shall be by Hastelloy C276 brushes that shall not have been used on carbon or low alloy steels for Hastelloy C276 pipe. All tools used in fabrication shall be protected to minimize contact with steel alloys or free iron. Grinding wheels and brushes shall be identified and controlled for their use on these materials only to ensure that contamination of these materials does not occur.

Antispatter compounds, marking fluids, marking pens, tape, temperature indicating crayons, and other tools shall have a total halogen content of less than 200 parts per million.

Heat input control for welding shall be specified in the applicable WPS and shall not exceed 55,000 joules per inch (22,000 joules per cm) as determined by the following formula:

$$\text{Heat Input (J/in.)} = \frac{\text{Voltage} \times \text{Amperage} \times 60}{\text{Travel Speed (in./min.)}}$$

Complete penetration pressure retaining welds shall be made using the Gas Tungsten Arc Welding (GTAW) process for the root and second layer as a minimum.

Austenitic stainless steel instrument tubing shall be welded using only the GTAW process.

Socket welds or butt welds in all austenitic stainless steel instrument tubing lines shall require an inert gas backing (purge) using argon during welding to avoid oxidation.

The application of heat to correct weld distortion and dimensional deviation without prior written approval from the Engineer is prohibited.

Unless otherwise approved in writing, the GTAW process shall require the addition of filler metal.

The maximum preheat and interpass temperature for austenitic stainless steel shall be 350° F. The minimum preheat temperature shall be 50° F.

Complete joint penetration welds welded from one side without backing, weld repairs welded from one side without backing, or weld repairs in which the base metal remaining after excavation is less than 0.1875 inch from being through wall, which are fabricated from austenitic stainless steel ASME P-number 8 base metal or unassigned metals with similar chemical compositions, shall have the root side of the weld purged with an argon backing gas prior to welding. Backing gas (purge) shall only be argon. The argon backing gas shall be classified as welding grade argon or shall meet Specification SFA-5.32, AWS Classification SG-A. The backing gas (purge) shall be maintained until a minimum of two layers of weld metal have been deposited.

**2-3. SHOP CLEANING AND PICKLING OF STAINLESS STEEL PIPING AND WELDS.** All stainless steel piping shall be thoroughly cleaned and pickled at the mill in accordance with ASTM A380.

Pickling shall produce a modest etch and shall remove all embedded iron and heat tint. After fabrication, pickled surfaces shall be subjected to a 24 hour water test or a ferroxyl test to detect the presence of residual embedded iron. All

pickled surfaces damaged during fabrication including welded areas shall either be mechanically cleaned or repickled or passivated in accordance with ASTM A380. Materials that have been contaminated with steel alloys or free iron shall not be used until all contamination is removed. When cleaning to remove steel or iron contamination is required, it shall be performed in accordance with ASTM A380, Code D requirements. Mechanical cleaning is not an acceptable cleaning method for oxygen or ozone piping. All stainless steel surfaces shall be adequately protected during fabrication, shipping, handling, and installation to prevent contamination from iron or carbon steel objects or surfaces. Particulate matter shall be removed from piping and welds. Labels shall be affixed to the piping sections to indicate shop cleaning has been performed. Welds shall be either mechanically cleaned or pickled or passivated on the exterior of the pipe.

For buried piping, at least the exterior of all welds shall be passivated.

2-4. HIGH TEMPERATURE EPOXY COATING. Not used.

2-5. INSULATING FITTINGS. In all piping, insulating fittings shall be provided to prevent contact of dissimilar metals, including but not limited to, contact of copper, brass, or bronze pipe, tubing, fittings, valves, or appurtenances, or stainless steel pipe, tubing, fittings, valves, or appurtenances with iron or steel pipe, fittings, valves, or appurtenances. Insulating fittings shall also be provided to prevent contact of copper, brass, or bronze pipe, tubing, fittings, valves or appurtenances with stainless steel pipe, tubing, fittings, valves, or appurtenances.

### PART 3 - EXECUTION

3-1. INSTALLATION. Materials furnished under this section will be installed in accordance with the Miscellaneous Piping and Accessories Installation section.

End of Section



Section 15070

COPPER TUBING AND ACCESSORIES

PART 1 - GENERAL

1-1. SCOPE. This section covers the furnishing of copper tubing and accessories. Copper tubing shall be furnished complete with all fittings, flanges, unions, and other accessories specified herein.

1-2. SUBMITTALS.

1-2.01. Drawings and Data. Complete specifications, data, and catalog cuts or drawings shall be submitted in accordance with the Submittals Procedures section. Submittals are required for all piping, fittings, gaskets, sleeves, and accessories, and shall include the following data:

- Name of Manufacturer
- Type and model
- Construction materials, thickness, and finishes
- Pressure and temperature ratings

Contractor shall obtain and submit a written statement from the gasket material manufacturer certifying that the gasket materials are compatible with the joints specified herein and are recommended for the specified field test pressures and service conditions.

1-3. DELIVERY, STORAGE, AND HANDLING. Shipping shall be in accordance with the Product Delivery Requirements section. Handling and storage shall be in accordance with the Product Storage and Handling Requirements section. All materials shall be stored in a sheltered location above the ground, separated by type, and shall be supported to prevent sagging or bending.

PART 2 - PRODUCTS

2-1. MATERIALS. Copper tubing materials and service shall be as specified herein.

2-1.01. Material Classification CU-1.

<p>CU-1 – Water Tubing with Compression Fittings</p> <p>Buried water supply, 2 inch and smaller.</p>	<p>Tubing      Soft annealed copper tubing, ASTM B88, Type K.</p> <p>Fittings      Compression type, brass, Crawford "Swagelok" or Parker Hannifin "CPI".</p>
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2-1.02. Material Classification CU-2. Not used.

2-1.03. Material Classification CU-3. Not used.

2-1.04. Material Classification CU-4. Not used.

2-1.05. Material Classification CU-5. Not used.

2-1.06. Material Classification CU-6. Not used.

2-1.07. Material Classification CU-7. Not used.

2-1.08. Material Classification CU-8. Not used.

2-1.09. Accessory Materials. Accessory materials for the copper tubing systems shall be as indicated.

**PART 3 - EXECUTION**

3-1. INSTALLATION. Materials furnished under this section will be installed in accordance with the Miscellaneous Piping and Accessories Installation section.

End of Section

Section 15091

MISCELLANEOUS BALL VALVES

PART 1 - GENERAL

1-1. SCOPE. This section covers the furnishing of manually operated or remote activated two position (open-close) ball valves as specified herein.

Miscellaneous ball valves shall be provided where AWWA type ball valves are not required.

Piping, pipe supports, insulation, and accessories that are not an integral part of the valves or are not specified herein are covered in other sections.

1-2. GENERAL.

1-2.01. General Equipment Stipulations. The General Equipment Stipulations shall apply to all equipment and materials furnished under this section. If the requirements in this section are different from those in the General Equipment Stipulations, the requirements in the section shall take precedence.

1-2.02. Identification. Valves specified herein shall be tagged in accordance with the Equipment and Valve Identification section.

1-3. SUBMITTALS. Complete drawings, details, and specifications covering the valves and their appurtenances shall be submitted in accordance with the Submittals Procedures section. Included in the submittal shall be drawings by the valve manufacturer to indicate the position of the valve actuator and valve shaft.

PART 2 - PRODUCTS

2-1. CONSTRUCTION. Ball valves shown on the drawing, but not specified herein, shall be selected to match piping material they are installed in.

2-1.01. Valves Type VB-1. Not used.

2-1.02. Valves Type VB-2. Not used.

2-1.03. Valves Type VB-3.

VB-3	Rating 800 psi nonshock cold WOG
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Gate valve flushing connection	Code Type	MSS SP-110 In-line, two piece, end entry, regular port
2 inch and smaller	Body/Bonnet	ASTM A351-CF8M, stainless steel
	Trim	Reinforced Teflon
	Seat	ASTM A276-316, stainless steel
	Ball	ASTM A276-316, stainless steel
	Stem	Reinforced Teflon
	Thrust Washer	Teflon or Viton
	Stem Seal	Threaded End
	End Connection	-20 to 400°F
	Temp. Limitations	Lever
	Valve Operator	Conbraco Industries "Apollo 76-100 Series"; Neles-Jamesbury "Series 4000"
	Manufacturers	

- 2-1.04. Valves Type VB-4. Not used.
- 2-1.05. Valves Type VB-5. Not used.
- 2-1.06. Valves Type VB-6. Not Used.
- 2-1.07. Valves Type VB-7. Not used.
- 2-1.08. Valves Type VB-8. Not used.
- 2-1.09. Valves Type VB-9. Not used.
- 2-1.10. Valves Type VB-10. Not used.
- 2-1.11. Valves Type VB-11. Not used.
- 2-1.12. Valves Type VB-12. Not used.
- 2-1.13. Valves Type VB-13. Not used.
- 2-1.14. Valves Type VB-14. Not used.
- 2-1.15. Valves Type VB-15. Not used.
- 2-1.16. Valves Type VB-16. Not used.
- 2-1.17. Valves Type VB-17. Not used.



2-1.18. Length Tolerance. Unless otherwise specified, the actual length of valves shall be within plus or minus 1/16 inch of the specified or theoretical length.

2-1.19. Shop Coatings. All ferrous metal surfaces of valves and accessories, both interior and exterior, shall be shop coated for corrosion protection. The valve manufacturer's standard coating will be acceptable, provided it is functionally equivalent to the specified coating.

Coating Materials

Coal Tar Epoxy	High-build coal tar epoxy; Ameron "Amercoat 78HB Coal Tar Epoxy", Carboline "Bitumastic 300 M", Tnemec "46H-413 Hi-Build Tneme-Tar", or Sherwin-Williams "Hi-Mil Sher-Tar Epoxy".
Epoxy Enamel (for liquid service)	Ameron "Amerlock 400 High-Solids Epoxy Coating", Carboline "Carboguard 891", or Tnemec "Series N140 Pota-Pox Plus".
Rust-Preventive Compound	As recommended by the manufacturer.

Surfaces To Be Coated

Unfinished Surfaces

Interior Surfaces

Liquid Service                      Epoxy enamel.

Exterior Surfaces of Valves  
To Be Buried, Submerged,  
or Installed in Manholes or  
Valve Vaults                      Coal tar epoxy.

Exterior Surfaces of all other  
valves                      Universal primer.

2-2. VALVE ACTUATORS. Ball valve shall be provided with manual actuators. Unless otherwise specified or indicated on the drawings, each manual actuator shall be equipped with a lever operator.

2-3. ACCESSORIES. If the drawings indicate the need for extension stems, stem guides; position indicator; floor boxes; valve boxes; or operating stands, refer to the Valve and Gate Actuator section.

PART 3 - EXECUTION

3-1. INSTALLATION. Materials furnished under this section shall be installed in accordance with the Valve Installation section.

End of Section

Section 15101

AWWA BUTTERFLY VALVES

PART 1 – GENERAL

1-1. SCOPE. This section covers furnishing of AWWA butterfly valves for cold water service.

AWWA butterfly valves shall be furnished complete with actuators and accessories as specified herein, and as specified in the Valve and Gate Actuators section.

1-2. GENERAL. Equipment provided under this section shall be fabricated and assembled in full conformity with Drawings, Specifications, engineering data, instructions, and recommendations of the equipment manufacturer, unless exceptions are noted by Engineer.

Valves shall be furnished with all necessary parts and accessories indicated on the Drawings, specified, or otherwise required for a complete, properly operating installation and shall be the latest standard products of a manufacturer regularly engaged in the production of valves.

1-2.01. General Equipment Stipulations. The General Equipment Stipulations shall apply to all equipment furnished under this section. If requirements in this specification differ from those in the General Equipment Stipulations, the requirements specified herein shall take precedence.

1-2.02. Governing Standard. Except as modified or supplemented herein, all butterfly valves and manual actuators shall conform to the applicable requirements of ANSI/AWWA C504.

1-2.03. Marking. Supplementing the requirements of Section 6.1 of the governing standard, the country of origin of all castings and an identifying serial number shall be stamped on a corrosion-resistant plate attached to the valve body.

1-2.04. Temporary Number Plates. Not used.

1-2.05. Identification. AWWA butterfly valves shall be tagged in accordance with the Equipment and Valve Identification section.

1-3. SUBMITTALS. Complete drawings, details, and specifications covering the valves and their appurtenances shall be submitted in accordance with the Submittals Procedures section. Included in the submittal shall be drawings by the valve manufacturer to indicate the position of the valve actuator and valve shaft.

PART 2 - PRODUCTS

2-1. ACCEPTABLE PRODUCTS. Butterfly valves shall be by the manufacturers listed below.

DeZurik  
Pratt (Mueller)

2-2. MATERIALS. Except as modified or supplemented herein, materials used in the manufacture of butterfly valves shall conform to the requirements of the governing standard.

Acceptable shop coatings are listed in the following table.

Epoxy	
For Raw or Treated Water Service in potable water facilities (NSF certified)	PPG Amercoat "Amerlock 400 High Solids Epoxy", Carboline "Carboguard 891", Sherwin-Williams "Macropoxy 646NSF" or Tnemec "Series N140 Pota-Pox Plus".
Rust-Preventive Compound	As recommended by manufacturer.

2-3. VALVE CONSTRUCTION.

2-3.01. Valve Bodies. Valves shall be short-body type unless otherwise specified. The use of a stop or lug cast integrally with or mechanically secured to the body for the purpose of limiting disc travel by means of direct contact or interference with the valve disc (in either the open or closed position) will not be acceptable.

2-3.02. Flanges. Flanges shall be finished to true plane surfaces within a tolerance limit of 0.005 inch. The finished face shall be normal to the longitudinal

valve axis within a maximum angular variation tolerance of 0.002 inch per foot (0.017 percent) of flange diameter.

2-3.03. Mechanical Joint Ends. Mechanical joint ends shall be either mechanical joint or push-on ends conforming to ANSI/AWWA C111/A21.11.

2-3.04. Valve Shafts. Valve shafts shall be fabricated of AISI Type 304 or 316 stainless steel. The use of shafts having a hexagonal cross section will not be acceptable. The connection between shaft and disc shall be in accordance with the governing standard.

The connection between the shaft and the disc shall be mechanically secured by means of solid, smooth sided, stainless steel or monel taper pins or dowel pins. Each taper pin or dowel pin shall extend through or shall wedge against the side of the shaft and shall be mechanically secured in place. The use of set screws, knurled or fluted dowel pins, expansion pins, roll pins, tension pins, spring pins, or other devices instead of the pins specified herein will not be acceptable.

2-3.05. Valve Seats. Acceptable seating surfaces mating with rubber are AISI Type 304 or 316 stainless steel, monel, or plasma-applied nickel-chrome overlay for all valves; bronze for 20 inch and smaller valves; and alloy cast iron for 20 inch and smaller manually operated valves.

Seats shall be located on the valve body or disc. Valve seat configurations which rely on the mating pipe flange to hold the seat in position in the valve body will not be acceptable.

2-3.06. Shaft Seals. Shaft seals shall be of the chevron type.

2-3.07. Thrust Bearings. Each valve shall be provided with one or more thrust bearings in accordance with the governing standard. Thrust bearings which are directly exposed to line liquid and which consist of a metal bearing surface in rubbing contact with an opposing metal bearing surface will not be acceptable.

2-4. VALVE ACTUATORS. Requirements for valve actuators shall be as specified herein and as specified in the Valve and Gate Actuators section. Valve actuator types shall be manual type.

All 8 inch and larger valves shall have geared actuators.

If valves with an AWWA class designation higher than specified are furnished, actuator torque capabilities shall be increased accordingly and shall be acceptable to Engineer.

2-4.01. Actuator Sizing. The valve manufacturer shall size the actuator in

accordance with the governing standard, the operating conditions and the valve manufacturer's requirements.

Unless otherwise indicated or specified, actuator torque requirements shall be based on a maximum differential pressure across the valve equal to the maximum pressure associated with the valve class and a maximum velocity through the valve of 16 feet per second.

2-5. SHOP PAINTING. All interior and exterior ferrous metal surfaces, except finished surfaces, bearing surfaces, and stainless steel components, of valves and accessories shall be shop painted for corrosion protection. The valve manufacturer's standard coating will be acceptable, provided it is functionally equivalent to the specified coating and is compatible with the specified field painting.

Surfaces shall be painted as follows:

Unfinished Surfaces

Interior Surfaces (NSF Certified)	Epoxy.
Exterior Surfaces of Valves to be Buried or Installed in Manholes or Valve Vaults	Epoxy.
Exterior Surfaces of Valves to be Submerged	Epoxy.
Exterior Surfaces of All Other Valves	Universal primer.

Polished or Machined Surfaces

Flange Faces	Rust-preventive compound.
Other Surfaces	Epoxy.

Interior coatings shall comply with ANSI/AWWA C550 and shall be free of holidays. The total dry film thickness of shop-applied coatings shall be not less than:

<u>Type of Coating</u>	<u>Minimum Dry Film Thickness</u>
Epoxy	10 mils
Universal Primer	3 mils

2-6. ACCESSORIES. Requirements for extension stems and stem guides, position indicators, floor boxes, operating stands, torque tubes, valve boxes, and

extension bonnets shall be as specified in the Valve and Gate Actuators section.

### PART 3 - EXECUTION

3-1. INSTALLATION. Valves shall be installed in accordance with the Valve Installation section.

3-1.01. Installation Check. An installation check by an authorize representative of the manufacturer is not required.

End of Section





## Section 15104

### RESILIENT-SEATED GATE VALVES

#### PART 1 - GENERAL

1-1. SCOPE. This section covers furnishing resilient-seated AWWA gate valves for clear water service. Resilient-seated gate valves shall be furnished complete with actuators and accessories as specified herein, and as specified in the Valve and Gate Actuator section.

1-2. GENERAL. Equipment provided under this section shall be fabricated and assembled in full conformity with the Drawings, Specifications, engineering data, instructions, and recommendations of the equipment manufacturer unless exceptions are noted by Engineer.

Valves shall be furnished with all necessary parts and accessories indicated on the Drawings, specified, or otherwise required for a complete, properly operating installation and shall be the latest standard products of a manufacturer regularly engaged in the production of valves.

1-2.01. General Equipment Stipulations. The General Equipment Stipulations shall apply to all equipment furnished under this section. If requirements in this specification differ from those in the General Equipment Stipulations, the requirements specified herein shall take precedence.

1-2.02. Governing Standard. Except as modified or supplemented herein, all resilient-seated gate valves shall conform to the applicable requirements of ANSI /AWWA C509ANSI/AWWA C515.

1-2.03. Temporary Number Plates. Each resilient-seat gate valve shall be tagged or marked in the factory with the identifying number listed on the Drawings.

1-2.04. Identification. Resilient seated gate valves shall be tagged in accordance with the Equipment and Valve Identification section.

1-3. SUBMITTALS. Complete drawings, details, and specifications covering the valves and their appurtenances shall be submitted in accordance with the Submittals Procedures section.

All valves shall be tested in accordance with Section 5 of the governing standard. Certified copies of the results of all tests, together with an affidavit of compliance

as indicated in Section 6.3 of the governing standard, shall be submitted to Engineer before the valves are shipped.

**PART 2 - PRODUCTS**

2-1. **ACCEPTABLE PRODUCTS.** Resilient-seated gate valves shall be by the manufacturers listed below:

- American Darling (AFC)
- Kennedy
- Mueller
- US Pipe
- CLOW
- M & H

2-2. **MATERIALS.** Except as modified or supplemented herein, materials used in the manufacture of resilient-seated gate valves shall conform to the requirements of the governing standard.

2-2.01. **Bronze Components.** All bronze valve components in contact with liquid shall contain less than 16 percent zinc. All aluminum bronze components in contact with liquid shall be inhibited against dealuminization in accordance with Section 4.2.3.5.4 of ANSI/AWWA C509 and Section 4.2.3.3.4 of ANSI/AWWA C515.

2-2.02. **Gaskets.** Gaskets shall be free of asbestos and corrosive ingredients.

2-2.03. **Shop Coatings.**

Epoxy

For Raw or Treated Water Service in potable water facilities (NSF certified systems)	PPG Amercoat "Amerlock 400 High-Solids Epoxy ", Carboline "Carboguard 891", Sherwin-Williams "Macropoxy 646NSF" or Tnemec "Series N140 Pota-Pox Plus".
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Rust-Preventive Compound	As recommended by manufacturer.
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Universal Primer	As recommended by manufacturer
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2-3. **VALVE CONSTRUCTION.**

2-3.01. Ends. Valve ends shall be compatible with connecting piping. Except as modified or supplemented herein, the ends shall conform to the applicable requirements of the governing standard.

Flanges shall be finished to true plane surfaces within a tolerance limit of 5 mils. The finished face shall be normal to the longitudinal valve axis within a maximum angular variation tolerance of 0.002 inch per inch of flange diameter.

2-3.02. Stem Seals. Valve stem shall be the non-rising type O-ring stem seals shall be provided for all buried gate valves, and for all gate valves with non-rising stems.

2-3.03. Rotation. The direction of rotation of the handwheel or the wrench nut to open the valve shall be to the left (counterclockwise).

2-3.04. Shop Coatings. All interior and exterior ferrous metal surfaces of valves and accessories shall be shop coated for corrosion protection. Except as specified below, the valve manufacturer's standard fusion-bonded coating will be acceptable, provided it is functionally equivalent to the specified coating and is compatible with the specified field coating.

Surfaces shall be coated as follows:

Unfinished Surfaces

Interior Surfaces	Epoxy.
Exterior Surfaces of Valves to be Buried or Installed in Manholes or Valve Vaults	Epoxy.
Exterior Surfaces of Valves to be Submerged	Epoxy.
Exterior Surfaces of All Other Valves	Universal primer.

Polished or Machined Surfaces

Flange Faces	Rust-preventive compound.
Other Surfaces	Epoxy.

Alternatively, the manufacturer's standard coating may be used and the interior surfaces of each valve shall be subjected to a nondestructive holiday test in accordance with ASTM G62, Method A, and shall be electrically void-free.

Interior coatings shall comply with ANSI/AWWA C550 and shall be free of holidays. The total dry film thickness of shop-applied coatings shall be not less than:

<u>Type of Coating</u>	<u>Minimum Dry Film Thickness</u>
Epoxy	10mils.
Universal Primer	3 mils.

2-4. VALVE ACTUATORS. Requirements for valve actuators shall be as specified in the Valve and Gate Actuator section.

2-5. ACCESSORIES. When the Drawings indicate the need for extension stems, stem guides, position indicators, floor boxes, valve boxes, or operating stands, refer to the Valve and Gate Actuator section.

### PART 3 - EXECUTION

3-1. INSTALLATION. Valves shall be installed in accordance with Valve Installation section.

3-1.01. Installation Check. Not used.

End of Section

## Section 15108

### AIR VALVES

#### PART 1 - GENERAL

1-1. SCOPE. This section covers furnishing air-release valves, combination air valves, air/vacuum valves and vacuum relief valves as required by the Work, and as indicated in the Air Valve Schedule.

1-2. GENERAL. Equipment provided under this section shall be fabricated and assembled in full conformity with the Drawings, Specifications, engineering data, instructions, and recommendations of the equipment manufacturer, unless exceptions are noted by Engineer.

Valves shall be furnished with all necessary parts and accessories indicated on the Drawings, specified, or otherwise required for a complete, properly operating installation and shall be the latest standard products of a manufacturer regularly engaged in the production of valves.

1-2.01. General Equipment Stipulations. The General Equipment Stipulations shall apply to all equipment furnished under this section. If requirements in this specification differ from those in the General Equipment Stipulations, the requirements specified herein shall take precedence.

1-2.02. Governing Standard. Except as modified or supplemented herein, all valves furnished under this section shall conform to the applicable performance requirements of ANSI/AWWA C512.

1-2.03. Identification. Air valves shall be tagged in accordance with the Equipment and Valve Identification section.

1-3. SUBMITTALS. Complete assembly drawings, together with detailed specifications and data covering materials used and accessories forming a part of the valves furnished, shall be submitted in accordance with the Submittals Procedures section.

#### PART 2 - PRODUCTS

2-1. CONSTRUCTION. Two inch and smaller combination air valves for clean water applications shall be of the integral type with a valve assembly which functions as both an air and vacuum valve and an air release valve. The valves shall be Apco/Valve and Primer "Single Body Combination Air Valves", Multiplex

"Crispin Universal Air Release Valves", ARI "No. D-040", or Val-Matic "Combination Air Valves".

Three inch and larger combination air valves for clean water applications shall consist of an air and vacuum valve with an externally mounted air release valve. The valves shall be Apco/Valve and Primer "Single Body Combination Air Valves" for 3 inch and "Custom Combination Air Valves" for 4 inch and larger, GA Industries "Figure 950 Kinetic Custom Combination Air Valves", Multiplex "Crispin Dual Air Valves", ARI "No. D-060-HF", or Val-Matic "Dual Body Combination Air Valves". Unless otherwise specified or indicated on the Drawings, valves shall be provided with surge check discs on the valve inlet to restrict the exhaust air flow rate.

2-2. MATERIALS. Except as modified or supplemented herein, materials of construction shall comply with the governing standard.

Valve Trim	Bronze or austenitic stainless steel or polymer materials.
Float	Austenitic stainless steel, polycarbonate, or foamed polypropylene.
Shop Coatings	
Epoxy (NSF-61 Certified)	PPG Amercoat "Amerlock 400 High Solids Epoxy", Carboline "Carboguard 891", Sherwin-Williams "Macropoxy 646NSF" or Tnemec "Series N140 Pota-Pox Plus".
Rust-Preventive Compound	As recommended by manufacturer.

2-3. SHOP PAINTING. All interior and exterior ferrous metal surfaces, except stainless steel components, shall be shop painted for corrosion protection. The valve manufacturer's standard coating will be acceptable, provided it is functionally equivalent to the specified coating and is compatible with the specified field coating. Field painting is covered in the Protective Coatings section.

Surfaces shall be painted as indicated:

Interior Surfaces of Valves in Clean Water Applications	NSF-61 Certified Epoxy.
Exterior Surfaces of Valves To Be Installed in Manholes or Valve Vaults	Coal tar epoxy. Epoxy.
Exterior Surfaces of All Other Valves	Universal primer.
Polished or Machined Surfaces	Rust-preventive compound.

Interior epoxy coatings for clean water valves shall comply with ANSI/AWWA C550/NSF 61. Interior coatings for all valves shall be free of holidays. The total dry film thickness of shop-applied coatings shall be not less than:

<u>Type of Coating</u>	<u>Minimum Dry Film Thickness</u>
Epoxy	10 mils
Universal Primer	3 mils

2-4. SHUTOFF VALVES. A shutoff valve shall be provided in the piping leading to each air valve. Shutoff valves 2 inches and smaller shall be ball valves as specified in the Miscellaneous Ball Valves section. Shutoff valves 3 inches and larger for clean water service shall be butterfly valves as specified in the AWWA Butterfly Valve section.

Each 4 inch and larger combination air valve shall be provided with a shutoff valve between the air and vacuum valve and the air release valve.

### PART 3 - EXECUTION

3-1. INSTALLATION. Air release and combination air valves shall be installed in accordance with the Valve Installation section.

End of Section





**Schedule 15108-S01  
Air Valves Schedule**

Tag Number	Type(1)	Location(2)	Inlet size (in)	Outlet Size (in)	Orifice Size (in)	Inlet Type(3)	Outlet Type(4)	Working Pressure (psi)
1.010								3.020
ARV #1	CAV	IV	8	8	*	125F	125F	110
ARV #2	CAV	IV	8	8	*	125F	125F	110
ARV #3	CAV	IV	8	8	*	125F	125F	110
ARV #4	CAV	IV	8	8	*	125F	125F	110
ARV #5	CAV	IV	8	8	*	125F	125F	110
ARV #6	CAV	IV	8	8	*	125F	125F	110
ARV #7	CAV	IV	8	8	*	125F	125F	110
ARV #8	CAV	IV	4	4	*	125F	125F	110
ARV #9	CAV	IV	4	4	*	125F	125F	110
ARV #10	CAV	IV	4	4	*	125F	125F	110

\* As Required by Valve Manufacturer based on Service Conditions

Notes:

(1) Abbreviations for types are as indicated:

ARV	Air Release Valve
CAV	Combination Air Valve
ARVR	Air Release and Vacuum Relief Valve
VRV	Vacuum Relief Valve

(2) Abbreviations for locations are as indicated:

IP	In-plant
IV	In-vault

(3) Abbreviations for inlet types are as indicated:

T	Threaded, ANSI/ASME B1.20.1, NPT
125F	Flanged, ANSI/ASME B16.1, Class 125
250F	Flanged, ANSI/ASME B16.1, Class 250

(4) Abbreviations for outlet types are as indicated:

T	Threaded, ANSI/ASME B1.20.1, NPT
125F	Flanged, ANSI/ASME B16.1, Class 125
PH	Protective hood

End of Schedule

Section 15180

VALVE AND GATE ACTUATORS

PART 1 - GENERAL

1-1. SCOPE. This section covers furnishing manual and powered valve and gate actuators and accessories as specified herein.

1-2. GENERAL. Equipment provided under this section shall be fabricated and assembled in full conformity with Drawings, specifications, engineering data, instructions, and recommendations of the equipment manufacturer, unless exceptions are noted by Engineer.

Actuators shall be furnished with all necessary parts and accessories indicated on the Drawings, specified, or otherwise required for a complete, properly operating installation and shall be the latest standard products of a manufacturer regularly engaged in the production of actuators.

1-2.01. General Equipment Stipulations. The General Equipment Stipulations shall apply to all equipment furnished under this section. If requirements in this specification differ from those in the General Equipment Stipulations, the requirements specified herein shall take precedence.

1-2.02. Governing Standards. Except as modified or supplemented herein, cylinder and vane type actuators shall conform to applicable requirements of ANSI/AWWA C541.

Except as modified or supplemented herein, electric motor actuators shall conform to applicable requirements of ANSI/AWWA C542.

Except as modified or supplemented herein, actuators for butterfly and eccentric plug valves shall conform to the applicable requirements of ANSI/AWWA C504.

Except as modified or supplemented herein, manual actuators for ball valves shall conform to the applicable requirements of ANSI/AWWA C507.

Except as modified or supplemented herein, actuators for cast-iron slide gates shall conform to the applicable requirements of ANSI/AWWA C560.

Except as modified or supplemented herein, actuators for open channel slide gates and weir gates shall conform to the applicable requirements of ANSI/AWWA C513.

Except as modified or supplemented herein, actuators for stainless steel slide gates shall conform to the applicable requirements of ANSI/AWWA C561.

Except as modified or supplemented herein, actuators for composite slide gates shall conform to the applicable requirements of ANSI/AWWA C563.

1-2.03. Power Supply. Not used.

1-2.04. Marking. Each actuator shall be marked with the manufacturer's name, model number, and the country of origin. An identifying serial number shall be stamped on a corrosion-resistant plate attached to the actuator.

1-2.05. Temporary Number Plates. Each actuator shall be factory tagged or marked to identify the actuator and the applicable valve or gate by number or service as indicated in the valve or gate schedule or on the Drawings.

1-3. SUBMITTALS. Complete drawings, details, and specifications covering the actuators and their appurtenances shall be submitted in accordance with the Submittal Procedures section. Submittal drawings shall clearly indicate the country of origin of each actuator and its components.

Submittal drawings shall include separate wiring diagrams for each electrically operated or controlled actuator and the electrical control equipment. Each actuator drawing shall be identified with the respective valve number or name.

## PART 2 - PRODUCTS

### 2-1. PERFORMANCE AND DESIGN REQUIREMENTS.

2-1.01. General. Actuators and appurtenances shall be designed for the conditions and requirements as indicated in the respective valve and gate sections.

Liberal factors of safety shall be used throughout the design, especially in the design of parts subject to intermittent or alternating stresses. In general, working stresses shall not exceed one-third of the yield point or one-fifth of the ultimate strength of each material.

2-1.02. Valve Actuators. Each actuator shall be designed to open or close the valve under all operating conditions. Actuators shall be designed for the maximum pressure differential across the valve and maximum velocities through the valve where indicated in the respective valve schedules.

Valve actuators shall be provided and adjusted by the valve manufacturer. Actuator mounting arrangements and positions shall facilitate operation and maintenance and shall be determined by the valve manufacturer unless indicated otherwise on the Drawings or directed by Engineer.

When valves are to be buried, submerged, or installed in vaults; the actuators and accessories shall be sealed to prevent the entrance of water. The design water depth shall be as indicated in the respective valve schedules but not less than 20 feet .

2-1.03. Gate Actuators. Not used.

2-1.04. Limit Switches. Not used.

2-2. MATERIALS. Except as modified or supplemented herein, materials used in the manufacture of actuators shall conform to the requirements of the applicable governing standard(s).

2-3. VALVE MANUAL ACTUATORS.

2-3.01. General. Manual actuators of the types listed in the valve specifications or schedules shall be provided by the valve manufacturer.

The direction of rotation of the wheel, wrench nut, or lever to open the valve shall be to the left (counterclockwise). Each valve body or actuator shall have cast thereon the word "Open" and an arrow indicating the direction to open.

The housing of traveling-nut type actuators shall be fitted with a removable cover which shall permit inspection and maintenance of the operating mechanism without removing the actuator from the valve. Travel limiting devices shall be provided inside the actuator for the open and closed positions. Travel limiting stop nuts or collars installed on the reach rod of traveling-nut type operating mechanisms shall be field adjustable and shall be locked in position by means of a removable roll pin, cotter pin, or other positive locking device. The use of stop nuts or adjustable shaft collars which rely on clamping force or setscrews to prevent rotation of the nut or collar on the reach rod will not be acceptable.

Each actuator shall be designed so that shaft seal leakage cannot enter the actuator housing.

Valves for throttling service shall be equipped with an infinitely variable locking device or a totally enclosed gear actuator.

Actuators shall produce the required torque with a maximum pull of 80 lbs on the lever, handwheel, or chain. Actuator components shall withstand, without

damage, a pull of 200 lbs on the handwheel or chainwheel or an input of 300 foot-lbs on the operating nut.

2-3.02. Handwheels. Handwheel diameters shall be at least 8 inches but not more than 24 inches for 30 inch and smaller valves and not more than 30 inches for 36 inch and larger valves.

2-3.03. Chainwheels. Not used.

2-3.04. Levers. Levers shall be capable of being locked in at least five intermediate positions between fully open and fully closed in any building or structure containing lever operated valves, at least two operating levers shall be provided for each size and type of lever operated valve.

2-3.05. Chain Levers. Not used.

2-3.06. Wrench Nuts. Unless otherwise specified in the valve schedules or on the Drawings, wrench nuts shall be provided on all buried valves and on all valves that are to be operated through floor boxes. Unless otherwise directed by Owner, all wrench nuts shall comply with Section 4.4.13 of ANSI/AWWA C500. At least two operating keys shall be furnished for operation of the wrench nut operated valves.

2-3.07. Operating Stands. Not used.

2-3.08. Wall Brackets. Not used.

2-4. GATE MANUAL ACTUATORS. Not used.

2-5. INTELLIGENT ELECTRIC ACTUATORS. Not used.

2-6. STANDARD ELECTRIC ACTUATORS. Not used.

2-7. HYDRAULIC CYLINDER ACTUATORS. Not used.

2-8. AIR CYLINDER ACTUATORS. Not used.

2-9. VANE TYPE PNEUMATIC ACTUATORS. Not used.

2-10. AIR-OIL CYLINDER ACTUATORS. Not used.

2-11. PORTABLE ELECTRIC ACTUATORS. Not used.

2-12. PORTABLE HYDRAULIC ACTUATORS. Not used.

## 2-13. ACTUATOR ACCESSORIES.

2-13.01. Extension Stems. Extension stems and stem guides shall be furnished when indicated in the respective valve schedules, indicated on the Drawings, or otherwise required for proper valve operation. Extension stems shall be of solid steel and shall be not smaller in diameter than the stem of the actuator shaft. Extension stems shall be connected to the actuator with a single Lovejoy "Type D" universal joint with grease-filled protective boot. All stem connections shall be pinned.

At least two stem guides shall be furnished with each extension stem, except for buried valves. Stem guides shall be of cast iron, bronze bushed, and adjustable in two directions. Stem guide spacing shall not exceed 100 times the stem diameter or 10 feet , whichever is smaller. The top stem guide shall be designed to carry the weight of the extension stem. The extension stem shall be provided with a collar pinned to the stem and bearing against the stem thrust guide.

Extension stems for buried valve actuators shall extend to within 6 inches of the ground surface, shall be centered in the valve box using spacers, and shall be equipped with a wrench nut.

Extension stems for buried valve actuators shall be provided with position indicators as specified in the valve schedules.

2-13.02. Position Indicators. Unless otherwise specified, each valve actuator shall be provided with a position indicator to display the position of the plug or disc relative to the body seat opening.

For quarter turn plug, ball, or cone type valves installed in interior locations, the indicating pointer shall be mounted on the outer end of the valve operating shaft extension and shall operate over an indicating scale on the operating mechanism cover. Where the shaft passes through the cover, a suitable stuffing box or other seal shall be provided to prevent the entrance of water.

Each actuator for butterfly valves, except where located in manholes, buried, or submerged, shall have a valve disc position indicator mounted on the end of the valve shaft. A disc position indicator shall also be provided on each operating stand or the actuator mounted thereon.

2-13.02.01. Position Indicators for Buried Actuators. When specified in the respective valve schedules, each buried valve actuator shall be equipped with a position indicator. Position indicators shall be Indico "Model 179 Valve Position Indicators" manufactured by the Mills Engineering Company, Needham Heights, Massachusetts, or "Diviner" ground level position indicator manufactured by the Henry Pratt Company, Aurora, Illinois. Each indicator assembly shall be designed

for installation on the extension stem connected to the operating stem of the buried actuator mechanism and shall be mounted in the top section of the valve box beneath the valve box cover. Each indicator shall be equipped with a wrench nut. Internal gearing shall be sealed and protected from the elements.

2-13.03. Floor Boxes. Not used.

2-13.04. Torque Tubes. Not used.

2-13.05. Valve Boxes. Each valve buried to a depth of 4 feet or less shall be provided with a slide type valve box. Valve boxes shall be cast iron, extension sleeve type, suitable for the depth of cover indicated on the Drawings. Only one extension will be allowed with each slide type valve box. Valve boxes shall be at least 5 inches in inside diameter, shall be at least 3/16 inch thick, and shall be provided with suitable cast iron bases and covers.

Each valve buried deeper than 4 feet shall be provided with a valve box consisting of a cast iron cover and a 6 inch Cast Iron Pipe section. The cover shall be Clay & Bailey "No. 2193". The pipe shaft shall extend from the valve to 5 inches inside the valve box cover.

All parts of valve boxes, bases, and covers shall be shop coated with manufacturer's standard coating.

Valve boxes which are to be provided with position indicators shall have top sections and covers designed for proper installation of the position indicator and accessories.

2-14. SHOP PAINTING. All ferrous metal surfaces, except bearing and finished surfaces and stainless steel components of valve actuators and accessories, shall be shop painted for corrosion protection. The valve manufacturer's standard coating will be acceptable, provided it is functionally equivalent to the specified coating and is compatible with the specified field painting.

The following surfaces shall be painted:

Polished or Machined Surfaces	Rust-preventive compound.
Other Surfaces	Epoxy.
Actuators and Accessories	Universal primer.



PART 3 - EXECUTION

3-1. INSTALLATION. Actuators will be installed on the valves in accordance with the Valve Installation section.

3-2. NETWORK SETUP. Not used.

End of Section

