PROJECT MANUAL

FOR

WATER LINE PTRWA - ASHEBORO

PIEDMONT TRIAD REGIONAL WATER AUTHORITY
RANDOLPH COUNTY, NORTH CAROLINA

TWC JOB NO. 3190-L

JUNE 2025

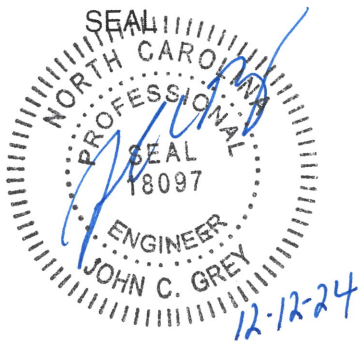
Wooten

119 Brookstown Avenue, Suite 100
Winston-Salem, NC 27101
336.722.5326
License Number: F-0115

CERTIFICATIONS PAGE

A. Civil Specifications

I, John C. Grey, P.E., hereby certify that Division 01, Division 09, Division 31, Division 32, and Division 33 of the Water Line PTRWA - Asheboro Project Manual were prepared by me or under my direct supervision.



B. Electrical Specifications

I, Henry M. Bourne, P.E., hereby certify that Division 26 of the Water Line PTRWA - Asheboro Project Manual were prepared by me or under my direct supervision.

SEAL



END OF SECTION

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END OF DOCUMENT

ADVERTISEMENT FOR BIDS

GENERAL NOTICE

Piedmont Triad Regional Water Authority (Owner) is requesting Bids for the construction of the following:

Project: Water Line PTRWA - Asheboro

Wooten Project Number: 3190-L

Owner: Piedmont Triad Regional Water Authority

7297 Adams Farm Road

Randleman, NC 27317

Engineer & Issuing Office for Bidding Documents:

The Wooten Company

119 Brookstown Avenue, Suite 100

Winston-Salem, NC 27101

336.722.5326

The award of a contract under this solicitation will be paid with federal funding. Funding is contingent upon compliance with all terms and conditions of funding award. All prospective contractors shall comply with all applicable federal laws, regulations, executive orders, FEMA requirements and the terms and conditions of the funding award. In addition, vendors submitting quotes shall be responsible for complying with state law and local ordinances.

Bids for the construction of the Project will be received at the PTRWA Office Conference Room, located at 7297 Adams Farm Rd, Randleman, NC 27317 until Thursday August 21, 2025 at 11:00 am local time. At that time the Bids received will be publicly opened and read aloud.

The Project includes the following Work:

1 Approximately 18,241 LF of 16-inch DIP water main with Meter vault and sitework and associated appurtenances

2 Approximately 567 LF of 20-inch HDPE water main installed via HDD and associated appurtenances

Bids are requested for the following Contract: Water Line PTRWA - Asheboro

OBTAINING THE BIDDING DOCUMENTS

Prospective Bidders may examine the Bidding Documents as follows:

The Issuing Office and Owner's Office on Monday through Friday between the hours of 9 am and 4 pm.

Dodge Construction (online)

Construct Connect (online)

North American Procurement Council, Inc. (online)

HUB Solicitation Opportunities (click here for link)

Prospective Bidders may obtain Bidding Documents upon the submittal of the non-refundable fee, as listed below, to the attention of Ms. Jennifer Perry (jperry@thewootencompany.com) at the issuing office.

To submit a Bid for the Project, Prospective Bidders are required to register with the designated website as a plan holder.

With a request for Bidding Documents supply the following information:

> Company name, contact person with email, street address, and phone numbers; N. C. contractor's license with limitation and classification; indicate if the firm will be a Bidder, Supplier or Sub-Contractor.

Obtaining the Bidding Documents:

> Access to Website Download of PDF: Registration and access to the Issuing Office Project Bidding site for Electronic download of Bidding Documents as PDF files for a fee in the amount of $50.00. This does not include printed copies.
>
> Access to Website and Printed Copies: Bidding Documents, including full size Drawings, will be shipped to the Bidder for a fee in the amount of $100.00. The Bidding Documents will be shipped UPS ground. This fee will include registration and access to the Issuing Office Project Bidding site for electronic download of Bidding Documents as PDF Files.

Partial sets of Bidding Documents will not be available from the Issuing Office

If Bidding Documents are obtained from a plan room or source other than the designated website in either electronic or paper format, Bidder must still be registered at the Bid Website. The designated website will be updated periodically with addenda, lists of registered plan holders, reports, and other information relevant to submitting a Bid for the Project. All official notifications, addenda, and other Bidding Documents will be offered only through the designated website. Neither Owner nor Engineer will be responsible for Bidding Documents, including addenda, if any, obtained from sources other than the designated website.

PRE-BID CONFERENCE

A pre-bid conference for the Project will be held on Thursday, August 7, 2025 at 10:00 am at PTRWA Office Conference Room , 7297 Adams Farm Rd, Randleman, NC 27317. Attendance at the pre-bid conference is encouraged but not required.

INSTRUCTIONS TO BIDDERS.

Bidders will be required to show evidence that they are licensed to perform the work in the Bidding Documents as required by North Carolina General Statute, Chapter 87 and the Instructions to Bidders.

Bid Security in the amount of five (5) percent of the Bid must accompany each Bid and shall be subject to the conditions provided in the Instructions to Bidders.

The Owner is an Equal Opportunity Employer and encourages bidding by small, minority and female contractors and does not discriminate on the basis of handicapped status. Bids from qualified disadvantaged business enterprise (DBE) are encouraged.

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

The Owner reserves the right to waive any informality or to reject any or all Bids. Unless all Bids are rejected, Award will be made to the lowest responsible Bidder, taking into consideration quality, performance and the time specified in the proposals for the performance of the Contract.

END OF SECTION

INSTRUCTION TO BIDDERS

ARTICLE 1 DEFINED TERMS

1.01 Terms used in these Instructions to Bidders have the meanings indicated in the General Conditions and Supplementary Conditions. Additional terms used in these Instructions to Bidders have the meanings indicated below:

A. Issuing Office—The office from which the Bidding Documents are to be issued, and which registers plan holders.

ARTICLE 2 BIDDING DOCUMENTS

2.01 Bidder shall obtain a complete set of Bidding Requirements and proposed Contract Documents (together, the Bidding Documents). See the Agreement for a list of the Contract Documents. It is Bidder's responsibility to determine that it is using a complete set of documents in the preparation of a Bid. Bidder assumes sole responsibility for errors or misinterpretations resulting from the use of incomplete documents, by Bidder itself or by its prospective Subcontractors and Suppliers.

2.02 Bidding Documents are made available for the sole purpose of obtaining Bids for completion of the Project and permission to download or distribution of the Bidding Documents does not confer a license or grant permission or authorization for any other use. Authorization to download documents, or other distribution, includes the right for plan holders to print documents solely for their use, and the use of their prospective Subcontractors and Suppliers, provided the plan holder pays all costs associated with printing or reproduction. Printed documents may not be re-sold under any circumstances.

2.03 Engineer has established a Bidding Documents Website as indicated in the Advertisement or Invitation to Bid.

A. To Bid the Project, Engineer requires that Bidder register as a plan holder with the Issuing Office at such website, and obtain a complete set of the Bidding Documents from such website. Bidders may rely that sets of Bidding Documents obtained from the Bidding Documents Website are complete, unless an omission is blatant. Registered plan holders will receive Addenda issued by Engineer.

2.04 Bidder shall register as a plan holder and obtain complete sets of Bidding Documents, in the number and format stated in the Advertisement or invitation to bid, from the Issuing Office. Bidders may rely that sets of Bidding Documents obtained from the Issuing Office are complete, unless an omission is blatant. Registered plan holders will receive Addenda issued by Engineer.

2.05 Plan rooms (including construction information subscription services, and electronic and virtual plan rooms) may distribute the Bidding Documents, or make them available for examination. Those prospective bidders that obtain an electronic (digital) copy of the Bidding Documents from a plan room are required to register as plan holders from the Bidding Documents Website or Issuing Office. Engineer is not responsible for omissions in Bidding Documents or other documents obtained from plan rooms, or for a Bidder's failure to obtain Addenda from a plan room.

2.06 Electronic Documents

A. When the Bidding Requirements indicate that electronic (digital) copies of the Bidding Documents are available, such documents will be made available to the Bidders as Electronic Documents in the manner specified.

Document prepared in accordance with EJCDC No. C-200 (2018) & RUS Bulletin 1780-26(2019) Exhibit B, Attachment 3

1. Bidding Documents will be provided in Adobe PDF (Portable Document Format) (.pdf) that is readable by Adobe Acrobat Reader Version 2020 or later. It is the intent of the Engineer and Owner that such Electronic Documents are to be exactly representative of the paper copies of the documents. However, because the Owner and Engineer cannot totally control the transmission and receipt of Electronic Documents nor the Contractor's means of reproduction of such documents, the Owner and Engineer cannot and do not guarantee that Electronic Documents and reproductions prepared from those versions are identical in every manner to the paper copies.

B. Unless otherwise stated in the Bidding Documents, the Bidder may use and rely upon complete sets of Electronic Documents of the Bidding Documents, described in Paragraph 2.06.A above. However, Bidder assumes all risks associated with differences arising from transmission/receipt of Electronic Documents versions of Bidding Documents and reproductions prepared from those versions and, further, assumes all risks, costs, and responsibility associated with use of the Electronic Documents versions to derive information that is not explicitly contained in printed paper versions of the documents, and for Bidder's reliance upon such derived information.

ARTICLE 3 QUALIFICATIONS OF BIDDERS

3.01 Bidders are notified that Chapter 87, Article 1 of the General Statutes of North Carolina, will be observed in receiving and awarding contracts. Bidders for this Project must be licensed in the following classifications and limitations:

A. General: Must have a General Contractors license with one of the following classifications with a limitation appropriate to the bid amount.

1. Classifications:
    a. Unclassified
    b. Public Utilities Contractor
    c. Public Utilities (Water Lines and Sewer Lines)
2. Limitations:
    a. "Limited": Up to $750,000
    b. "Intermediate": Up to $1,500,000
    c. "Unlimited": No limit on contract value

3.02 To demonstrate Bidder's qualifications to perform the Work, after submitting its Bid and within five (5) days of Owner's request, Bidder must submit the following information:

A. Official name of Bidder and length of time the organization has been in business under present name.

B. Address, phone and fax numbers of main place of business. Address and phone numbers of company office that will manage the Project if different than above.

C. Officers of the company. Name and resume of designated project manager and field superintendent. Number of regular employees of the organization.

D. Unique Entity Identification Number from www.SAM.gov

E. Latest financial statement showing assets and liabilities of the company.

F. Name and home office address of the Surety proposed and the name and address of the responsible local claim agent.

G. Listing of completed projects of similar size and type. Provide name and phone number of project owner representative.

H. Existing work commitments.

I. List of work to be subcontracted. Name and addresses of subcontractors.

J. Names and addresses of major material Suppliers.

K. Statement that bidder is capable of completing the project within the stated time.

3.03 The apparent Low Bidder shall submit within 72 hours of the Bid Date the following Affidavits:
A. Affidavit C, Portion of the Work to be Performed by Minority Firms.
B. Affidavit D, Good Faith Efforts

3.04 A Bidder's failure to submit required qualification information within the times indicated may disqualify Bidder from receiving an award of the Contract.

3.05 No requirement in this Article 3 to submit information will prejudice the right of Owner to seek additional pertinent information regarding Bidder's qualifications.

ARTICLE 4 PRE-BID CONFERENCE

4.01 A non-mandatory pre-bid conference will be held at the time and location indicated in the Advertisement or Invitation to Bid. Representatives of Owner and Engineer will be present to discuss the Project. Bidders are encouraged to attend and participate in the conference; however, attendance at this conference is not required to submit a Bid.

4.02 Information presented at the pre-Bid conference does not alter the Contract Documents. Owner will issue Addenda to make any changes to the Contract Documents that result from discussions at the pre-Bid conference. Information presented, and statements made at the pre-bid conference will not be binding or legally effective unless incorporated in an Addendum.

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

5.01 Site and Other Areas
A. The Site is identified in the Bidding Documents. By definition, the Site includes rights-of-way, easements, and other lands furnished by Owner for the use of the Contractor. Any additional lands required for temporary construction facilities, construction equipment, or storage of materials and equipment, and any access needed for such additional lands, are to be obtained and paid for by Contractor. All permits, regulatory approvals and fees associated with obtaining the additional area shall be the full responsibility of the Contractor.

5.02 Existing Site Conditions
A. Subsurface and Physical Conditions; Hazardous Environmental Conditions
1. The Supplementary Conditions identify the following regarding existing conditions at or adjacent to the Site:
a. Those reports of explorations and tests of subsurface conditions at or adjacent to the Site that contain Technical Data.
b. Those drawings known to Owner of existing physical conditions at or adjacent to the Site, including those drawings depicting existing surface or subsurface structures at or adjacent to the Site (except Underground Facilities), that contain Technical Data.
c. Reports and drawings known to Owner relating to Hazardous Environmental Conditions that have been identified at or adjacent to the Site.
d. Technical Data contained in such reports and drawings.

2. Copies of reports and drawings referenced above will be available to Bidders registered at the Bidding Website. These documents can be downloaded in PDF format under "Existing Site Conditions Documents." Site-related documents will not be available in printed hard copies. These reports and drawings are not part of the Contract Documents, but the Technical Data contained therein upon whose accuracy Bidder is entitled to rely, as provided in the General Conditions, has been identified and established in the Supplementary Conditions. Bidder is responsible for any interpretation or conclusion Bidder draws from any Technical Data or any other data, interpretations, opinions, or information contained in such reports or shown or indicated in such drawings.
3. If the Supplementary Conditions do not identify Technical Data, the default definition of Technical Data set forth in Article 1 of the General Conditions will apply.

B. Underground Facilities: Underground Facilities are shown or indicated on the Drawings, pursuant to Paragraph 5.05 of the General Conditions, and not in the drawings referred to in Paragraph 5.02.A of these Instructions to Bidders. Information and data regarding the presence or location of Underground Facilities are not intended to be categorized, identified, or defined as Technical Data.
1. Unless noted otherwise, information and data shown or indicated in the Bidding Documents with respect to existing Underground Facilities at or contiguous to the Site is based upon information and data furnished to Engineer by owners of such Underground Facilities.

5.03 Other Site-related Documents

A. No other Site-related documents are available.

5.04 Site Visit and Testing by Bidders

A. Bidder is required to visit the Site and conduct a thorough visual examination of the Site and adjacent areas. During the visit, the Bidder must not disturb any ongoing operations at the Site.

B. Bidders visiting the Site are required to arrange their own transportation to the Site.

C. Access to the Site other than during a regularly scheduled Site visit must be coordinated through the Engineer. Bidder must conduct the required Site visit during normal working hours.

D. Bidder is not required to conduct any subsurface testing, or exhaustive investigations of Site conditions.

E. On request, and to the extent Owner has control over the Site, and schedule permitting, the Owner will provide Bidder general access to the Site to conduct such additional examinations, investigations, explorations, tests, and studies as Bidder deems necessary for preparing and submitting a successful Bid. Owner will not have any obligation to grant such access if doing so is not practical because of existing operations, security or safety concerns, or restraints on Owner's authority regarding the Site. Bidder is responsible for establishing access needed to reach specific selected test sites.

F. Bidder must comply with all applicable Laws and Regulations regarding excavation and location of utilities, obtain all permits, and comply with all terms and conditions established by Owner or by property owners or other entities controlling the Site with respect to schedule, access, existing operations, security, liability insurance, and applicable safety programs.

G. Bidder must fill all holes and clean up and restore the Site to its former condition upon completion of such explorations, investigations, tests, and studies.

5.05 Owner's Safety Program

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

5.06 Other Work at the Site

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

ARTICLE 6 BIDDER'S REPRESENTATIONS AND CERTIFICATIONS

6.01 Express Representations and Certifications in Bid Form, Agreement

A. The Bid Form that each Bidder will submit contains express representations regarding the Bidder's examination of Project documentation, Site visit, and preparation of the Bid, and certifications regarding lack of collusion or fraud in connection with the Bid. Bidder should review these representations and certifications, and assure that Bidder can make the representations and certifications in good faith, before executing and submitting its Bid.

B. If Bidder is awarded the Contract, Bidder (as Contractor) will make similar express representations and certifications when it executes the Agreement.

ARTICLE 7 INTERPRETATIONS AND ADDENDA

7.01 Owner on its own initiative may issue Addenda to clarify, correct, supplement, or change the Bidding Documents.

7.02 Bidder shall submit all questions about the meaning or intent of the Bidding Documents to Engineer in writing. Contact information and submittal procedures for such questions are as follows:

A. Questions will not be taken by phone. Questions may be e-mailed to Engineer's E-mail address as follows: jgrey@thewootencompany.com

7.03 Submittal with questions shall include the project name, reference to sheet number or specification section as appropriate, the person's name submitting the question, firm, telephone number, and email address.

7.04 Interpretations or clarifications considered necessary by Engineer in response to such questions will be issued by Addenda delivered to all registered plan holders. Questions received less than seven days prior to the date for opening of Bids may not be answered.

7.05 Only responses set forth in an Addendum will be binding. Oral and other interpretations or clarifications will be without legal effect. Responses to questions are not part of the Contract Documents unless set forth in an Addendum that expressly modifies or supplements the Contract Documents.

ARTICLE 8 BID SECURITY

8.01 A Bid must be accompanied by Bid security made payable to Owner in an amount of five (5) percent of Bidder's maximum Bid price (determined by adding the base bid and all alternates) and in the form of a Bid bond issued by a surety meeting the requirements of Paragraph 6.01 of the General Conditions. Such Bid bond will be issued in the form included in the Bidding Documents.

8.02 The Bid security of the apparent Successful Bidder will be retained until Owner awards the contract to such Bidder, and such Bidder has executed the Contract, furnished the required Contract security, and met the other conditions of the Notice of Award, whereupon the Bid security will be released. If the Successful Bidder fails to execute and deliver the Contract and furnish the required Contract security within 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, in whole in the case of a penal sum bid bond, and to the extent of Owner's damages in the case of a damages-form bond. Such forfeiture will be Owner's exclusive remedy if Bidder defaults.

8.03 The Bid security of other Bidders that Owner believes to have a reasonable chance of receiving the award may be retained by Owner until the earlier of 7 days after the Effective Date of the Contract or 61 days after the Bid opening, whereupon Bid security furnished by such Bidders will be released.

8.04 Bid security of other Bidders that Owner believes do not have a reasonable chance of receiving the award will be released within 7 days after the Bid opening.

ARTICLE 9 CONTRACT TIMES

9.01 The number of days within which, or the dates by which, the Work is to be (a) substantially completed and (b) ready for final payment, and (c) Milestones (if any) are to be achieved, are set forth in the Agreement.

9.02 Provisions for liquidated damages, if any, for failure to timely attain a Milestone, Substantial Completion, or completion of the Work in readiness for final payment, are set forth in the Agreement.

ARTICLE 10 SUBSTITUTE AND "OR EQUAL" ITEMS

10.01 The Contract for the Work, as awarded, will be on the basis of materials and equipment specified or described in the Bidding Documents without consideration during the bidding and Contract award process of possible substitute or "or-equal" items. In cases in which the Contract allows the Contractor to request that Engineer authorize the use of a substitute or "or-equal" item of material or equipment, application for such acceptance may not be made to and will not be considered by Engineer until after the Effective Date of the Contract.

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

ARTICLE 11 SUBCONTRACTORS, SUPPLIERS, AND OTHERS

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

A. Electrical.

11.02 If requested by Owner, such list must be accompanied by an experience statement with pertinent information regarding similar projects and other evidence of qualification for each such Subcontractor or Supplier. If Owner or Engineer, after due investigation, has reasonable objection to any proposed Subcontractor or Supplier, Owner may, before the Notice of Award is given, request apparent Successful Bidder to submit an acceptable substitute, in which case apparent Successful Bidder will submit a substitute, Bidder's Bid price will be increased (or decreased) by the difference in cost occasioned by such substitution, and Owner may consider such price adjustment in evaluating Bids and making the Contract award.

11.03 If apparent Successful Bidder declines to make any such substitution, Owner may award the Contract to the next lowest Bidder that proposes to use acceptable Subcontractors and Suppliers. Declining to make requested substitutions will constitute grounds for forfeiture of the Bid security of any Bidder. Any Subcontractor or Supplier, so listed and against which Owner or Engineer makes no written objection prior to the giving of the Notice of Award will be deemed acceptable to Owner and Engineer subject to subsequent revocation of such acceptance as provided in Paragraph 7.07 of the General Conditions.

11.04 Contractor shall not award work to Subcontractor(s) in excess of the limits stated in SC 7.07A.

ARTICLE 12 PREPARATION OF BID

12.01 The Bid Form is included with the Bidding Documents.

A. All blanks on the Bid Form must be completed in ink and the Bid Form signed in ink. Erasures or alterations must be initialed in ink by the person signing the Bid Form. A Bid price must be indicated for each section, Bid item, alternate, adjustment unit price item, and unit price item listed therein.

B. If the Bid Form expressly indicates that submitting pricing on a specific alternate item is optional, and Bidder elects to not furnish pricing for such optional alternate item, then Bidder may enter the words "No Bid" or "Not Applicable."

12.02 If Bidder has obtained the Bidding Documents as Electronic Documents, then Bidder shall prepare its Bid on a paper copy of the Bid Form printed from the Electronic Documents version of the Bidding Documents. The printed copy of the Bid Form must be clearly legible, printed on 8½ inch by 11-inch paper and as closely identical in appearance to the Electronic Document version of the Bid Form as may be practical. The Owner reserves the right to accept Bid Forms which nominally vary in appearance from the original paper version of the Bid Form, providing that all required information and submittals are included with the Bid.

12.03 A Bid by a corporation must be executed in the corporate name by a corporate officer (whose title must appear under the signature), accompanied by evidence of authority to sign. The corporate address and state of incorporation must be shown.

12.04 A Bid by a partnership must be executed in the partnership name and signed by a partner (whose title must appear under the signature), accompanied by evidence of authority to sign. The official address of the partnership must be shown.

12.05 A Bid by a limited liability company must be executed in the name of the firm by a member or other authorized person and accompanied by evidence of authority to sign. The state of formation of the firm and the official address of the firm must be shown.

12.06 A Bid by an individual must show the Bidder's name and official address.

12.07 A Bid by a joint venture must be executed by an authorized representative of each joint venturer in the manner indicated on the Bid Form. The joint venture must have been formally established prior to submittal of a Bid, and the official address of the joint venture must be shown.

12.08 Signatures shall be signed in ink and properly witnessed. All names must be printed in ink below the signatures.

12.09 The Bid must contain an acknowledgment of receipt of all Addenda, the numbers of which must be filled in on the Bid Form. It is the bidder's responsibility to confirm the final number of addendums issued from the Bid Website prior to submitting the bid.

12.10 Postal and e-mail addresses and telephone number for communications regarding the Bid must be shown.

12.11 The Bid must contain evidence of Bidder's authority to do business in the state where the Project is located.

12.12 The Bid must contain evidence of Bidder's licensure and attach such certification to the Bid. Bidder's state contractor license number must also be shown on the Bid Form.

12.13 Bidder shall complete the form, Identification of Minority Business Participation, identifying the minority businesses that will be utilized on the project with corresponding total dollar value and Affidavit A, Listing of Good Faith Efforts, or Affidavit B, Intent to Perform Contract with own Workforce, as required by G.S. 143-128.2(c) and G.S. 143-128.2(f). Failure to comply with these requirements is grounds for rejection of the bid.

ARTICLE 13 BASIS OF BID

13.01 Unit Price

A. Bidders must submit a Bid on a unit price basis for each item of Work listed in the unit price section of the Bid Form.

B. The "Bid Price" (sometimes referred to as the extended price) for each unit price Bid item will be the product of the "Estimated Quantity", which Owner or its representative has set forth in the Bid Form, for the item and the corresponding "Bid Unit Price" offered by the Bidder. The total of all unit price Bid items will be the sum of these "Bid Prices"; such total will be used by Owner for Bid comparison purposes. The final quantities and Contract Price will be determined in accordance with Paragraph 13.03 of the General Conditions.

C. Discrepancies between the multiplication of units of Work and unit prices will be resolved in favor of the unit prices. Discrepancies between the indicated sum of any column of figures and the correct sum thereof will be resolved in favor of the correct sum.

ARTICLE 14 SUBMITTAL OF BID

14.01 The Bid Form is to be completed and submitted with the Bid security and the other documents required to be submitted under the terms of Article 2 of the Bid Form. The complete list of required bid documents can also be found in the attached Bidder's Checklist. The completed checklist shall be the first page of all bids submitted. The Bid Security shall be submitted in a separate envelope noted similarly as the Bid but noted as Bid Security on the outside of the envelope.

14.02 A Bid must be received no later than the date and time prescribed and at the place indicated in the Advertisement or invitation to bid. Bid must be enclosed in an opaque sealed package plainly marked on the outside with the following:

Bid for Water Line PTRWA - Asheboro
Bidder's Name and address
NC Contractor's license number with classification and limitation

14.03 If a Bid is sent by mail or other delivery system, the sealed envelope containing the Bid must be enclosed in a separate package plainly marked on the outside with the notation "BID ENCLOSED." A mailed Bid must be addressed to:

Gregory Flory, Executive Director
Piedmont Triad Regional Water Authority
7297 Adams Farm Road
Randleman, NC 27317

14.04 Bids received after the date and time prescribed for the opening of bids, or not submitted at the correct location or in the designated manner, will not be accepted and will be returned to the Bidder unopened.

ARTICLE 15 MODIFICATION AND WITHDRAWAL OF BID

15.01 An unopened Bid may be withdrawn by an appropriate document duly executed in the same manner that a Bid must be executed and delivered to the place where Bids are to be submitted prior to the date and time for the opening of Bids. Upon receipt of such notice, the unopened Bid will be returned to the Bidder.

15.02 If a Bidder wishes to modify its Bid prior to Bid opening, Bidder must withdraw its initial Bid in the manner specified in Paragraph 15.01 and submit a new Bid prior to the date and time for the opening of Bids.

15.03 No Bid may be withdrawn after the Bid opening for a period of time as indicated in the Bid Form except in accordance with the provisions of N. C. General Statues 143-129.1. Thereafter, if the Work is rebid, the Bidder will be disqualified from further bidding on the Work.

ARTICLE 16 OPENING OF BIDS

16.01 Bids will be opened at the time and place indicated in the advertisement or invitation to bid and, unless obviously non-responsive, read aloud publicly. A Tabulation and Summary of the amounts of the base Bids and major alternates, if any, will be made available to Bidders within seven (7) days after the opening of Bids.

ARTICLE 17 BIDS TO REMAIN SUBJECT TO ACCEPTANCE

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

ARTICLE 18 EVALUATION OF BIDS AND AWARD OF CONTRACT

18.01 Owner reserves the right to reject any or all Bids, including without limitation, nonconforming, nonresponsive, unbalanced, or conditional Bids. Owner also reserves the right to waive all minor Bid informalities not involving price, time, or changes in the Work.

18.02 Owner will reject the Bid of any Bidder that Owner finds, after reasonable inquiry and evaluation, to not be responsible.

18.03 If Bidder purports to add terms or conditions to its Bid, takes exception to any provision of the Bidding Documents, or attempts to alter the contents of the Contract Documents for purposes of the Bid, whether in the Bid itself or in a separate communication to Owner or Engineer, then Owner will reject the Bid as nonresponsive.

18.04 If Owner awards the contract for the Work, such award will be to the responsible Bidder submitting the lowest responsive Bid.

18.05 Evaluation of Bids

A. In evaluating Bids, Owner will consider whether the Bids comply with the prescribed requirements, and such alternates, unit prices, and other data, as may be requested in the Bid Form or prior to the Notice of Award.

B. For the determination of the apparent low Bidder when unit price bids are submitted, Bids will be compared on the basis of the total of the products of the estimated quantity of each item and unit price Bid for that item, together with any lump sum items.

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.

18.06 In evaluating whether a Bidder is responsible, Owner will consider the qualifications of the Bidder and may consider the qualifications and experience of Subcontractors and Suppliers proposed for those portions of the Work for which the identity of Subcontractors and Suppliers must be submitted as provided in the Bidding Documents.

18.07 Owner may conduct such investigations as Owner deems necessary to establish the responsibility, qualifications, and financial ability of Bidders and any proposed Subcontractors or Suppliers.

18.08 More than one Bid for the same Work from an individual or entity under the same or different names will not be considered. Reasonable grounds for believing that any Bidder has an interest in more than one Bid for the Work may be cause for disqualification of that Bidder and the rejection of Bids in which that Bidder has an interest

18.09 In determining the responsive Bidder, Owner shall take into consideration bidder's compliance with the requirements of G.S. 143-128.2(c). Failure of the low bidder to furnish affidavit(s) and documentation as required by the Bid Form for compliance with G.S. 143-128.2(c) may constitute a basis for disqualification of the Bid.

ARTICLE 19 BONDS AND INSURANCE

19.01 Article 6 of the General Conditions, as may be modified by the Supplementary Conditions, sets forth Owner's requirements as to performance and payment bonds, other required bonds (if any), and insurance. When the Successful Bidder delivers the executed Agreement to Owner, it must be accompanied by required bonds and insurance documentation.

19.02 Article 8, Bid Security, of these Instructions, addresses any requirements for providing bid bonds as part of the bidding process.

ARTICLE 20 SIGNING OF AGREEMENT

20.01 When Owner issues a Notice of Award to the Successful Bidder, it will be accompanied by the unexecuted counterparts of the Agreement along with the other Contract Documents as identified in the Agreement. Within 10 days (Required by GS 143-129b) thereafter, Successful Bidder must execute and deliver the required number of counterparts of the Agreement and any

bonds and insurance documentation required to be delivered by the Contract Documents to Owner. Within 10 days thereafter, Owner will deliver one fully executed counterpart of the Agreement to Successful Bidder, together with printed and electronic copies of the Contract Documents as stated in Paragraph 2.02 of the General Conditions.

20.02 In case of failure of Bidder to execute the Agreement within the time required, Owner may at his option consider Bidder in default, in which case Bid Bond accompanying Bid shall become the property of the Owner.

ARTICLE 21 SALES AND USE TAXES

21.01 The Owner is NOT exempt from sales tax. Said taxes must be included in the bid.

ARTICLE 22 FEDERAL REQUIREMENTS

22.01 Iran Divestment Act Certification. By executing this Contract, Contactor certifies that Contractor is not listed on the Iran Final Divestment List ("List") created by the State Treasurer pursuant to N.C.G.S. 147-86.55 et seq, the Iran Divestment Act ("Act"). In compliance with the Act's requirement, Contractor shall not utilize in the performance of this Agreement any subcontractor that is identified on the List. The List can be found on the State Treasurer's website at the address www.nctreasurer.com/Iran and should be updated at least every 180 days.

22.02 Boycotting Israel Certification. GS 147-86.80 et al, which prohibits state agencies and local governments from entering into contracts with an entity that has been identified by the North Carolina State Treasurer as a company that boycotts or is involved in a boycott of Israel. The State Treasurer's Office is required to publish a list of entities it has identified as engaging in these activities; Companies Boycotting Israel Parent and Subsidiary List. By executing this Contract, Contactor certifies that Contractor is not so listed. In compliance with the Act's requirement, Contractor shall not utilize in the performance of this Agreement any subcontractor that is identified on the List. The List can be found on the State Treasurer's website at Boycott Israel List and should be updated at least every 180 days.

END OF SECTION

SECTION 00 31 32

GEOTECHNICAL DATA

PART 1 GENERAL

1.01 INVESTIGATION

A. Soil and subsurface investigations were conducted at the site, the results of which are to be found in the report issued by:
   1. Soil Consultant:
      S&ME, Inc.
      8646 West Market St, Suite 105
      Greensboro, NC 27409
      336-288-7180
   2. Report Title:
      PENDING
      PENDING

B. A copy of the report is appended.

C. Bidders are urged to examine soil investigation data and to make their own investigation of the site before bidding.

1.02 INTERPRETATION

A. Soil investigation data are provided only for information and the convenience of bidders. The Owner and Engineer disclaim any responsibility for the accuracy, true location, and extent of the soils investigation that has been prepared by others. They further disclaim responsibility for interpretation of that data by bidders, as in projecting soil-bearing values, rock profiles, soil stability, and the presence, level, and extent of underground water.

B. Soil investigation data are not part of the Contract Documents.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 00 41 00.01

BIDDER'S CHECKLIST

Include this checklist as the first page of the submitted bidding documents. As listed in Article 2 of the Bid Form include the following items with the submitted Bid Documents:

-	Properly Executed Bid Form (Including the acknowledgement of all Addenda)
A.	Required Bid security in the form of a Bid Bond (EJCDC No. C-430) or Certified Check (circle type of security provided); Bid Bond shall include an executed Power of Attorney.
B1.	Identification of Minority Business Participation
B2.	Affidavit A, Listing of Good Faith Efforts; or Affidavit B, Intent to Perform Contract with Own Workforce
C.	E-Verify Affidavit
D.	Equipment Manufacturer's List
E.	Federal Contract Provisions
F.	Certificate of Insurance
G.	Unique Entity Identifier Number (UEI) from SAM.gov

END OF SECTION

BID FORM

Project: Water Line PTRWA - Asheboro

Bid From: _____

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

ARTICLE 1 -- OWNER AND BIDDER

1.01 This Bid is submitted to:

A. Gregory Flory, Executive Director at:
Piedmont Triad Regional Water Authority
7297 Adams Farm Road
Randleman, NC 27317

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

ARTICLE 2 -- ATTACHMENTS TO THIS BID

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

A. Required Bid security;
B. List of Proposed Equipment Manufacturers;
C. Evidence of authority to do business in the state of the Project;
D. Contractor's license number as evidence of Bidder's State Contractor's License;
E. Unique Entity Identifier (UEI) Number from www.SAM.gov
F. In accordance with GS 64-26(a), Bidders shall submit the E-Verify Affidavit to document that the work authorization of their employees has been verified through E-Verify. The Affidavit shall also document that the Bidders subcontractors comply with E-Verify.
G. In accordance with GS 143-128.2(c), Bidder shall identify on its bid the minority businesses that it will use on the project and the total dollar value of the bid that will be performed by the minority businesses and list the good faith efforts (Affidavit A) made to solicit participation. A Bidder that will perform all of the work with its own workforce may submit an Affidavit (B) to that effect in lieu of the affidavit (A) required above.
H. Federal Contract Provisions (signed by Bidder).

2.02 Submit the Bidder's Checklist as provided in the bidding documents with the bid submittal. The Checklist shall be completed and included as the first page of the submittal.

2.03 After the bid opening the Owner will consider all bids and alternates and determine the lowest responsible, responsive bidder. Upon notification of being the apparent low Bidder, the Bidder shall then file within 72 hours of the notification of being the apparent lowest bidder, the following:

A. An Affidavit (C) that includes a description of the portion of work to be executed by minority businesses, expressed as a percentage of the total contract price, which is equal to or more than the goal established by the Owner and indicated in the Instruction to Bidders, paragraph

Minority Participation Goals. This affidavit shall give rise to the presumption that the bidder has made the required good faith effort; or

B. Affidavit (D) of its good faith effort to meet the goal. The document must include evidence of all good faith efforts that were implemented, including any advertisements, solicitations and other specific actions demonstrating recruitment and selection of minority businesses for participation in the contract.

2.04 Bidder understands that if this Bid is accepted by the Owner, Bidder shall not substitute for the subcontractors named in the Bid Documents except as allowed in the Supplementary Conditions.

ARTICLE 3 -- BASIS OF BID—UNIT PRICES

3.01 Unit Price Bids

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

Item No.	Description	Unit	Est. Quantity	Unit Price	Bid Price
1	Mobilization	LS	1		
2	16-inch DIP Water Main	LF	16,739		
3	16-inch DIP Restrained Joint Main	LF	593		
4	16-inch Gate Valve & Box	EA	9		
5	Fire Hydrant Assembly	EA	9		
6	Connect to Existing 24-inch Main	EA	1		
7	Connect to Existing 16-inch Main	EA	2		
8	6-inch Blowoff Assembly	EA	2		
9	Air Release Valve in Manhole	EA	13		
10	Wattle Check Dam	EA	37		
11	Catch Basin Inlet Protection	EA	7		
12	Silt Fence Outlet	EA	54		
13	Temporary Construction Entrance	EA	2		
14	Signage at Railroad Crossing	EA	2		
15	16-inch Restrained Joint DIP Water Line w/ 30-inch Steel Encasement Bore & Jack (Within NCDOT R/W)	LF	634		
16	16-inch Restrained Joint DIP Water Line w/ 36-inch Steel Encasement Bore & Jack (Within NCDOT CA R/W)	LF	275		
17	Ductile Iron Fittings	LB	21,875		
18	Rock Excavation	CY	760		
19	Asphalt Pavement Repair (non NCDOT)	SY	45		
20	Concrete Pavement Repair	SY	105		
21	Gravel Driveway Repair	SY	494		

22	Wattle Silt Barrier (Silt Sock)	LF	1,910		
23	Silt Fence	LF	9,910		
24	20-inch fusible HDPE Watermain by Horizontal Directional Drill (+/- 567 LF)	LS	1		
25	Class B Riprap for Outlet Stabilization	SY	21		
26	Temporary Stream Crossing	EA	9		
27	Erosion Control Matting	SY	15,720		
28	Concrete Thrust Blocking	CY	32		
29	Meter Vault Site	LS	1		
30	30-inch Tree Removal	EA	1		
				Total of Unit Price Items	

3.01 Total Base Bid Price

A. The total Base Bid Price shall be as provided below (written out):

Total Base Bid Price: _____

ARTICLE 4 -- TIME OF COMPLETION

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

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

ARTICLE 5 -- BIDDER'S ACKNOWLEDGEMENTS: ACCEPTANCE PERIOD, INSTRUCTIONS, AND RECEIPT OF ADDENDA

5.01 Bid Acceptance Period

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

5.02 Instructions to Bidders

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

5.03 Receipt of Addenda

A. Bidder hereby acknowledges receipt of the following Addenda:

Addendum Number	Addendum Date

ARTICLE 6 -- BIDDER'S REPRESENTATION AND CERTIFICATIONS

6.01 Bidder's Representations

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

1. Bidder has examined and carefully studied the Bidding Documents, including Addenda.
2. Bidder has visited the Site, conducted a thorough visual examination of the Site and adjacent areas, and become familiar with the general, local, and Site conditions that may affect cost, progress, and performance of the Work.
3. Bidder is familiar with all Laws and Regulations that may affect cost, progress, and performance of the Work.
4. Bidder has carefully studied the reports of explorations and tests of subsurface conditions at or adjacent to the Site and the drawings of physical conditions relating to existing surface or subsurface structures at the Site that have been identified in the Supplementary Conditions, with respect to the Technical Data in such reports and drawings.
5. Bidder has carefully studied the reports and drawings relating to Hazardous Environmental Conditions, if any, at or adjacent to the Site that have been identified in the Supplementary Conditions, with respect to Technical Data in such reports and drawings.
6. Bidder has considered the information known to Bidder itself; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Bidding Documents; and the Technical Data identified in the Supplementary Conditions or by definition, with respect to the effect of such information, observations, and Technical Data on (a) the cost, progress, and performance of the Work; (b) the means, methods, techniques, sequences, and procedures of construction to be employed by Bidder, if selected as Contractor; and (c) Bidder's (Contractor's) safety precautions and programs.
7. Based on the information and observations referred to in the preceding paragraph, Bidder agrees that no further examinations, investigations, explorations, tests, studies, or data are necessary for the performance of the Work at the Contract Price, within the Contract Times, and in accordance with the other terms and conditions of the Contract.
8. 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.
9. Bidder has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder has discovered in the Bidding Documents, and of discrepancies between Site conditions and the Contract Documents, and the written resolution thereof by Engineer is acceptable to Contractor.
10. The Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.
11. The submission of this Bid constitutes an incontrovertible representation by Bidder that without exception the Bid and all prices in the Bid are premised upon performing and furnishing the Work required by the Bidding Documents.

6.02 Bidder's Certifications

A. The Bidder certifies the following:
   1. This Bid is genuine and not made in the interest of or on behalf of any undisclosed individual or entity and is not submitted in conformity with any collusive agreement or rules of any group, association, organization, or corporation.
   2. Bidder has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid.
   3. Bidder has not solicited or induced any individual or entity to refrain from bidding.

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

ARTICLE 7 - BID SUBMITTAL

7.01 Contractor's License

Number: _____

Classification: _____

Limitation: _____

Employer's Tax ID No: _____

7.02 BIDDER hereby submits this Bid as set forth above:

Bidder:

_____

(typed or printed name of organization)

By: _____

(individual's signature)

Name: _____

(typed or printed)

Title: _____

(typed or printed)

Date: _____

(typed or printed)

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

Attest: _____

(individual's signature)

Name: _____

(typed or printed)

Title: _____

(typed or printed)

Date: _____

(typed or printed)

Document prepared in accordance with EJCDC No. C-410 (2018) & RUS Bulletin 1780-26(2020) Exhibit B, Attachment4

Address for giving notices:

_____

_____

_____

Bidder's Contact:

Name: _____

(typed or printed)

Title: _____

(typed or printed)

Phone: _____

Email: _____

Address: _____

_____

END OF SECTION

BID BOND (PENAL SUM FORM)

Bidder Name: Address (principal place of business):	Surety Name: Address (principal place of business):
Owner Name: Piedmont Triad Regional Water Authority Address (principal place of business): 7297 Adams Farm Road Randleman, NC 27317	Bid Project (name and location): Water Line PTRWA - Asheboro US 311 and Heath Dairy Road Bid Due Date:
Bond Penal Sum: Date of Bond:	
Surety and Bidder, intending to be legally bound hereby, subject to the terms set forth in this Bid Bond, do each cause this Bid Bond to be duly executed by an authorized officer, agent, or representative.	
Bidder _____ (Full formal name of Bidder) By: _____ (Signature) Name: _____ (Printed or typed) Title: _____ Attest: _____ (Signature) Name: _____ (Printed or typed) Title: _____	Surety _____ (Full formal name of Surety) (corporate seal) By: _____ (Signature) (Attach Power of Attorney) Name: _____ (Printed or typed) Title: _____ Attest: _____ (Signature) Name: _____ (Printed or typed) Title: _____
Notes: (1) Note: Addresses are to be used for giving any required notice. (2) Provide execution by any additional parties, such as joint venturers, if necessary.	

1. Bidder and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to pay to Owner upon default of Bidder the penal sum set forth on the face of this Bond. Payment of the penal sum is the extent of Bidder's and Surety's liability. Recovery of such penal sum under the terms of this Bond will be Owner's sole and exclusive remedy upon default of Bidder.

2. Default of Bidder occurs upon the failure of Bidder to deliver within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner) the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents.

3. This obligation will be null and void if:

    3.1. Owner accepts Bidder's Bid and Bidder delivers within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner) the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents, or

    3.2. All Bids are rejected by Owner, or

    3.3. Owner fails to issue a Notice of Award to Bidder within the time specified in the Bidding Documents (or any extension thereof agreed to in writing by Bidder and, if applicable, consented to by Surety when required by Paragraph 5 hereof).

4. Payment under this Bond will be due and payable upon default of Bidder and within 30 calendar days after receipt by Bidder and Surety of written notice of default from Owner, which notice will be given with reasonable promptness, identifying this Bond and the Project and including a statement of the amount due.

5. Surety waives notice of any and all defenses based on or arising out of any time extension to issue Notice of Award agreed to in writing by Owner and Bidder, provided that the total time for issuing Notice of Award including extensions does not in the aggregate exceed 120 days from the Bid due date without Surety's written consent.

6. No suit or action will be commenced under this Bond prior to 30 calendar days after the notice of default required in Paragraph 4 above is received by Bidder and Surety, and in no case later than one year after the Bid due date.

7. Any suit or action under this Bond will be commenced only in a court of competent jurisdiction located in the state in which the Project is located.

8. Notices required hereunder must be in writing and sent to Bidder and Surety at their respective addresses shown on the face of this Bond. Such notices may be sent by personal delivery, commercial courier, or by United States Postal Service registered or certified mail, return receipt requested, postage pre-paid, and will be deemed to be effective upon receipt by the party concerned.

9. Surety shall cause to be attached to this Bond a current and effective Power of Attorney evidencing the authority of the officer, agent, or representative who executed this Bond on behalf of Surety to execute, seal, and deliver such Bond and bind the Surety thereby.

10. This Bond is intended to conform to all applicable statutory requirements. Any applicable requirement of any applicable statute that has been omitted from this Bond will be deemed to be included herein as if set forth at length. If any provision of this Bond conflicts with any applicable statute, then the provision of said statute governs and the remainder of this Bond that is not in conflict therewith continues in full force and effect.

11. The term "Bid" as used herein includes a Bid, offer, or proposal as applicable.

SECTION 00 43 14

POWER OF ATTORNEY, BID BOND

PAGE FOR ATTACHING

BID BOND

POWER OF ATTORNEY

END OF SECTION

Identification of HUB Certified/ Minority Business Participation

I,_____,
(Name of Bidder)

do hereby certify that on this project, we will use the following HUB Certified/ minority business as construction subcontractors, vendors, suppliers or providers of professional services.

Firm Name, Address and Phone #	Work Type	*Minority Category	**HUB Certified (Y/N)

*Minority categories: Black, African American (**B**), Hispanic (**H**), Asian American (**A**) American Indian (**I**), Female (**F**) Socially and Economically Disadvantaged (**D**)

**** HUB Certification with the state HUB Office required to be counted toward state participation goals.**

The total value of minority business contracting will be ($)_____.

State of North Carolina AFFIDAVIT A – Listing of Good Faith Efforts

County of _____

(Name of Bidder)

Affidavit of_____

I have made a good faith effort to comply under the following areas checked:

Bidders must earn at least 50 points from the good faith efforts listed for their bid to be considered responsive. (1 NC Administrative Code 30 I.0101)

- ❑ **1 – (10 pts)** Contacted minority businesses that reasonably could have been expected to submit a quote and that were known to the contractor, or available on State or local government maintained lists, at least 10 days before the bid date and notified them of the nature and scope of the work to be performed.
- ❑ **2 --(10 pts)** Made the construction plans, specifications and requirements available for review by prospective minority businesses, or providing these documents to them at least 10 days before the bids are due.
- ❑ **3** – **(15 pts)** Broken down or combined elements of work into economically feasible units to facilitate minority participation.
- ❑ **4 – (10 pts)** Worked with minority trade, community, or contractor organizations identified by the Office of Historically Underutilized Businesses and included in the bid documents that provide assistance in recruitment of minority businesses.
- ❑ **5** – **(10 pts)** Attended prebid meetings scheduled by the public owner.
- ❑ **6** – **(20 pts)** Provided assistance in getting required bonding or insurance or provided alternatives to bonding or insurance for subcontractors.
- ❑ **7 – (15 pts)** Negotiated in good faith with interested minority businesses and did not reject them as unqualified without sound reasons based on their capabilities. Any rejection of a minority business based on lack of qualification should have the reasons documented in writing.
- ❑ **8** – **(25 pts)** Provided assistance to an otherwise qualified minority business in need of equipment, loan capital, lines of credit, or joint pay agreements to secure loans, supplies, or letters of credit, including waiving credit that is ordinarily required. Assisted minority businesses in obtaining the same unit pricing with the bidder's suppliers in order to help minority businesses in establishing credit.
- ❑ **9** – **(20 pts)** Negotiated joint venture and partnership arrangements with minority businesses in order to increase opportunities for minority business participation on a public construction or repair project when possible.
- ❑ **10** - **(20 pts)** Provided quick pay agreements and policies to enable minority contractors and suppliers to meet cash-flow demands.

The undersigned, if apparent low bidder, will enter into a formal agreement with the firms listed in the Identification of Minority Business Participation schedule conditional upon scope of contract to be executed with the Owner. Substitution of contractors must be in accordance with GS143-128.2(d) Failure to abide by this statutory provision will constitute a breach of the contract.

The undersigned hereby certifies that he or she has read the terms of the minority business commitment and is authorized to bind the bidder to the commitment herein set forth.

Date:_____ Name of Authorized Officer:_____

Signature:_____

(SEAL) Title:_____

State of_____, County of_____

Subscribed and sworn to before me this _____day of _____20____

Notary Public_____

My commission expires _____

State of North Carolina --AFFIDAVIT B-- Intent to Perform Contract with Own Workforce.

County of _____

Affidavit of _____
(Name of Bidder)

I hereby certify that it is our intent to perform 100% of the work required for the _____

_____ contract.
(Name of Project)

In making this certification, the Bidder states that the Bidder does not customarily subcontract elements of this type project, and normally performs and has the capability to perform and will perform all elements of the work on this project with his/her own current work forces; and

The Bidder agrees to provide any additional information or documentation requested by the owner in support of the above statement. The Bidder agrees to make a Good Faith Effort to utilize minority suppliers where possible.

The undersigned hereby certifies that he or she has read this certification and is authorized to bind the Bidder to the commitments herein contained.

Date: _____ Name of Authorized Officer: _____

Signature: _____

Title: _____

(SEAL)

State of _____, County of _____
Subscribed and sworn to before me this _____ day of _____ 20 _____
Notary Public _____
My commission expires _____

State of North Carolina - AFFIDAVIT C - Portion of the Work to be Performed by HUB Certified/Minority Businesses

County of _____

(Note this form is to be submitted only by the apparent lowest responsible, responsive bidder.)

If the portion of the work to be executed by HUB certified/minority businesses as defined in GS143-128.2(g)

and 128.4(a),(b),(e) is equal to or greater than 10% of the bidders total contract price, then the bidder must complete this affidavit.
This affidavit shall be provided by the apparent lowest responsible, responsive bidder within **72 hours** after notification of being low bidder.

Affidavit of _____ I do hereby certify that on the
(Name of Bidder)

_____
(Project Name)

Project ID#_____ Amount of Bid $_____

I will expend a minimum of _____% of the total dollar amount of the contract with minority business enterprises. Minority businesses will be employed as construction subcontractors, vendors, suppliers or providers of professional services. Such work will be subcontracted to the following firms listed below.

Attach additional sheets if required

Name and Phone Number	*Minority Category	**HUB Certified Y/N	Work Description	Dollar Value

*Minority categories: Black, African American (**B**), Hispanic (**H**), Asian American (**A**) American Indian (**I**), Female (**F**) Socially and Economically Disadvantaged (**D**)

**** HUB Certification with the state HUB Office required to be counted toward state participation goals.**

Pursuant to GS143-128.2(d), the undersigned will enter into a formal agreement with Minority Firms for work listed in this schedule conditional upon execution of a contract with the Owner. Failure to fulfill this commitment may constitute a breach of the contract.

The undersigned hereby certifies that he or she has read the terms of this commitment and is authorized to bind the bidder to the commitment herein set forth.
Date:_____ Name of Authorized Officer:_____

Signature:_____

Title:_____

(SEAL)

State of _____, County of _____
Subscribed and sworn to before me this _____ day of _____ 20____
Notary Public_____
My commission expires_____

State of North Carolina AFFIDAVIT D – Good Faith Efforts

County of _____

(Note this form is to be submitted only by the apparent lowest responsible, responsive bidder.)

If the goal of 10% participation by HUB Certified/ minority business **is not** achieved, the Bidder shall provide the following documentation to the Owner of his good faith efforts:

Affidavit of _____ I do hereby certify that on the
(Name of Bidder)

_____
(Project Name)

Project ID#_____ Amount of Bid $_____

I will expend a minimum of _____% of the total dollar amount of the contract with HUB certified/ minority business enterprises. Minority businesses will be employed as construction subcontractors, vendors, suppliers or providers of professional services. Such work will be subcontracted to the following firms listed below. (Attach additional sheets if required)

Name and Phone Number	*Minority Category	**HUB Certified Y/N	Work Description	Dollar Value

*Minority categories: Black, African American (**B**), Hispanic (**H**), Asian American (**A**) American Indian (**I**), Female (**F**) Socially and Economically Disadvantaged (**D**)

** **HUB Certification with the state HUB Office required to be counted toward state participation goals.**

Examples of documentation that may be required to demonstrate the Bidder's good faith efforts to meet the goals set forth in these provisions include, but are not necessarily limited to, the following:

A. Copies of solicitations for quotes to at least three (3) minority business firms from the source list provided by the State for each subcontract to be let under this contract (if 3 or more firms are shown on the source list). Each solicitation shall contain a specific description of the work to be subcontracted, location where bid documents can be reviewed, representative of the Prime Bidder to contact, and location, date and time when quotes must be received.

B. Copies of quotes or responses received from each firm responding to the solicitation.

C. A telephone log of follow-up calls to each firm sent a solicitation.

D. For subcontracts where a minority business firm is not considered the lowest responsible sub-bidder, copies of quotes received from all firms submitting quotes for that particular subcontract.

E. Documentation of any contacts or correspondence to minority business, community, or contractor organizations in an attempt to meet the goal.

F. Copy of pre-bid roster

G. Letter documenting efforts to provide assistance in obtaining required bonding or insurance for minority business.

H. Letter detailing reasons for rejection of minority business due to lack of qualification.

I. Letter documenting proposed assistance offered to minority business in need of equipment, loan capital, lines of credit, or joint pay agreements to secure loans, supplies, or letter of credit, including waiving credit that is ordinarily required.

Failure to provide the documentation as listed in these provisions may result in rejection of the bid and award to the next lowest responsible and responsive bidder.

Pursuant to GS143-128.2(d), the undersigned will enter into a formal agreement with Minority Firms for work listed in this schedule conditional upon execution of a contract with the Owner. Failure to fulfill this commitment may constitute a breach of the contract.

Do not submit with bid Do not submit with bid Do not submit with bid Do not submit with bid Do not submit with bid Do not submit with bid

The undersigned hereby certifies that he or she has read the terms of this commitment and is authorized to bind the bidder to the commitment herein set forth.

Date:_____ Name of Authorized Officer:_____

Signature:_____

(SEAL) Title:_____

State of_____, County of _____

Subscribed and sworn to before me this _____day of _____20____

Notary Public_____

My commission expires _____

STATE OF NORTH CAROLINA

AFFIDAVIT

_____
COUNTY OR MUNICIPALITY

****

I, _____ (the individual attesting below), being duly authorized by and on behalf of _____ (the entity bidding on project hereinafter "Employer") after first being duly sworn hereby swears or affirms as follows:

1. Employer understands that E-Verify is the federal E-Verify 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 in accordance with NCGS §64-25(5).
2. Employer understands that Employers Must Use E-Verify. Each employer, after hiring an employee to work in the United States, shall verify the work authorization of the employee through E-Verify in accordance with NCGS§64-26(a).
3. Employer is a person, business entity, or other organization that transacts business in this State and that employs 25 or more employees in this State. (mark Yes or No)
   a. YES _____, or
   b. NO _____
4. Employer's subcontractors comply with E-Verify, and if Employer is the winning bidder on this project Employer will ensure compliance with E-Verify by any subcontractors subsequently hired by Employer.

This _____ day of _____, 20__.

_____
Signature of Affiant
Print or Type Name: _____

State of North Carolina County of _____

Signed and sworn to (or affirmed) before me, this the _____

day of _____, 20__.

My Commission Expires:

_____ _____
Notary Public

(Affix Official / Notarial Seal)

SECTION 00 43 33

EQUIPMENT MANUFACTURERS LIST

PART 1 GENERAL

1.01 SCOPE

A. Contract No., General Contractor, shall be required to attach the Equipment Manufacturers List with the Bid Form to indicate the selected manufacturers for the requested major pieces of equipment.

1.02 REQUIREMENTS

A. The requirements as they apply to the submitted list are indicated in Section 01 60 00, Equipment and Material, and the following administrative requirements:
   1. Provide a check mark (X) in the space provided to indicate the equipment which shall be provided for the Project. The list shall be fully executed and must clearly identify one and only one named equipment manufacturer for each required piece of equipment.
   2. Failure to completely and accurately fill out the list shall disqualify the Bid as non-responsive.
   3. Named manufacturers on the list of acceptable equipment are for information purposes for the Contractor. Named manufacturers products are acceptable provided the supplied equipment meets the requirements of the Project specifications.
   4. "Or Equal" manufacturers may be listed in the blank provided for each item of equipment. The Contractor shall be required to follow the provisions for the approval of "Or Equal" pieces of equipment as outlined in Section 01600, Equipment and Material.

PART 2 PRODUCTS

2.01 NOT USED

PART 3 EXECUTION

3.01 NOT USED

END OF SECTION

WATERLINE PTRWA - ASHEBORO

EQUIPMENT LIST

A. Section 33 14 13, Electromagnetic Flowmeter
   1. EndressHauser
   2. XXX
   3. XXX
   4. "Equal" _____

B. Section XX XX XX, Electronic Control Valve
   1. Cla-Val
   2. XX
   3. XX
   4. "Equal" _____

RESPECTFULLY SUBMITTED:

(TYPE OR PRINT NAME)

(SIGNATURE)

(TITLE)

LICENSE NUMBER:

DATE:

(SEAL - IF BID IS BY A CORPORATION)

END OF SECTION

NOTICE OF AWARD

Date of Issuance: Date of Notice of Award	
Owner: Piedmont Triad Regional Water Authority	Owner's Project No.: Owner's ID
Engineer: The Wooten Company	Engineer's Project No.: 3190-L
Project: Water Line PTRWA – Asheboro	
Contract Name: Water Line PTRWA – Asheboro	
Bidder: Contractor's Legal Name	
Bidder's Address: Contractor's Street Address Contractor's City, State, Zip Code	
Effective Date of Contract: Date of Contract	

You are notified that Owner has accepted your Bid dated Day, Month date, year for the above Contract, and that you are the Successful Bidder and are awarded a Contract for:

1. Water Line PTRWA – Asheboro

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

Enter No. of copies sent (i.e. Four (4)) unexecuted counterparts of the Agreement accompany this Notice of Award, and one copy of the Contract Documents accompanies this Notice of Award, or has been transmitted or made available to Bidder electronically.

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

1. Deliver to Owner four copies counterparts of the Agreement, signed by Bidder (as Contractor).
2. Deliver with the signed Agreement(s) the Contract security (such as required performance and payment bonds) and insurance documentation, as specified in the Instructions to Bidders and in the General Conditions, Articles 2 and 6.
3. Other conditions precedent (if any):

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

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

Owner: PTRWA	Contractor: Contractor's Legal Name
By (signature): _____	By (signature): _____
Name (print): Gregory Flory	Name (print): _____
Title: Executive Director	Title: _____
Date: _____	Date: _____

copy: Engineer

END OF SECTION

2018 EJCDC® C-510, Notice of Award.

AGREEMENT

THIS AGREEMENT is by and between Piedmont Triad Regional Water Authority (Owner) and Contractor's Legal Name (Contractor).

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

Owner and Contractor hereby agree as follows:

ARTICLE 1 - WORK

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

A. Approximately 18,241 LF of 16-inch DIP water main with Meter vault and sitework and associated appurtenances

B. Approximately 567 LF of 20-inch HDPE water main installed via HDD and associated appurtenances

ARTICLE 2 - 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:

Water Line PTRWA - Asheboro

ARTICLE 3 - ENGINEER

3.01 The Owner has retained The Wooten Company ("Engineer") to act as Owner's representative, assume all duties and responsibilities of Engineer, and have the rights and authority assigned to Engineer in the Contract.

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

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 *Contract Times: Days*

A. The Work will be substantially completed within 240 days after the date when the Contract Times commence to run as provided in Paragraph 4.01 of the General Conditions, and completed and ready for final payment in accordance with Paragraph 15.06 of the General Conditions within 270 days after the date when the Contract Times commence to run.

4.03 *Liquidated Damages*

A. Contractor and Owner recognize that time is of the essence as stated in Paragraph 4.01 above and that Owner will suffer financial and other losses if the Work is not completed and Milestones not achieved within the Contract Times, as duly modified. The parties also recognize the delays, expense, and difficulties involved in proving, in a legal or arbitration proceeding, the actual loss suffered by Owner if the Work is not completed on time. Accordingly, instead of requiring any such proof, Owner and Contractor agree that as liquidated damages for delay (but not as a penalty):

1. *Substantial Completion*: Contractor shall pay Owner $750 for each day that expires after the time (as duly adjusted pursuant to the Contract) specified above for Substantial Completion, until the Work is substantially complete.

2. *Completion of Remaining Work*: After Substantial Completion, if Contractor shall neglect, refuse, or fail to complete the remaining Work within the Contract Times (as duly adjusted pursuant to the Contract) for completion and readiness for final payment, Contractor shall pay Owner $750 for each day that expires after such time until the Work is completed and ready for final payment

3. Liquidated damages for failing to timely attain Milestones, Substantial Completion, and final completion could overlap and therefore be additive.

B. If Owner recovers liquidated damages for a delay in completion by Contractor, then such liquidated damages are Owner's sole and exclusive remedy for such delay, and Owner is precluded from recovering any other damages, whether actual, direct, excess, or consequential, for such delay, except for special damages (if any) specified in this Agreement.

ARTICLE 5---CONTRACT PRICE

5.01 Owner shall pay Contractor for completion of the Work in accordance with the Contract Documents, the amounts that follow, subject to adjustment under the Contract:

All specific allowances are included in the above price in accordance with paragraph 13.02 of the General Conditions.

A. For all Unit Price Work, an amount equal to the sum of the extended prices (established for each separately identified item of Unit Price Work by multiplying the unit price times the actual quantity of that item). The total of the Unit Price Work as indicated in Contractor's Bid, attached hereto as an exhibit is $_____.

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

B. Total of Lump Sum Amount and Unit Price Work (subject to final Unit Price adjustment) $_____

ARTICLE 6--PAYMENT PROCEDURES

6.01 *Submittal and Processing of Payments*

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

6.02 *Progress Payments; Retainage*

A. Owner shall make progress payments on the basis of Contractor's Applications for Payment on or about the 15th day of each month during performance of the Work as provided in Paragraph 6.02.A.1 below, provided that such Applications for Payment have been submitted in a timely manner and otherwise meet the requirements of the Contract. All such payments will be measured by the Schedule of Values established as provided in the General Conditions (and in the case of Unit Price Work based on the number of units completed) or, in the event there is no Schedule of Values, as provided elsewhere in the Contract.

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

a. 95 percent of the value of the Work completed (with the balance being retainage) in accordance with NC GS 143-141.1(b1)(1).
1) If 50 percent or more of the Work has been completed, as determined by Engineer, and if the character and progress of the Work have been satisfactory to Owner and Engineer, then as long as the character and progress of the Work remain satisfactory to Owner and Engineer, there will be no additional retainage in accordance with NC GS 143-141.1(b1)(2); and

b. 95 percent of cost of materials and equipment not incorporated in the Work (with the balance being retainage).

B. Upon Substantial Completion of the entire construction to be provided under the construction Contract Documents, Owner shall pay an amount sufficient to increase total payments to Contractor to 100 percent of the Work completed, less such amounts set off by Owner pursuant to Paragraph 15.01.E of the General Conditions, and less 200 percent of Engineer's estimate of the value of Work to be completed or corrected as shown on the punch list of items to be completed or corrected prior to final payment.

6.03 *Final Payment*

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

6.04 *Consent of Surety*

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

6.05 *Interest*

A. Once a Progress or Final Payment Application has been submitted by the contractor, recommended by the Engineer, and Approved by the Owner, if payment is not made, the Contractor will be due interest beginning on the 46th day following Owner acceptance at a rate of 1 percent (1%) per month or fraction thereof in accordance with NC General Statute 143-134.1(a).

ARTICLE 7--CONTRACT DOCUMENTS

7.01 *Contents*

A. The Contract Documents consist of all of the following:

1. This Agreement.
2. Bonds:
    a. Performance bond (together with power of attorney).
    b. Payment bond (together with power of attorney).
3. General Conditions.
4. Supplementary Conditions.
5. Specifications as listed in the table of contents of the project manual (copy of list attached).
6. Drawings (not attached but incorporated by reference) consisting of 32 sheets with each sheet bearing the following general title: Water Line PTRWA - Asheboro
7. Addendum Issued during Bidding
    a. No. _____, Dated _____
8. Exhibits to this Agreement (enumerated as follows):
    a. Contractor's Bid Dated _____
9. The following which may be delivered or issued on or after the Effective Date of the Contract and are not attached hereto:
    a. Notice to Proceed.
    b. Work Change Directives.
    c. Change Order.
    d. Field Orders.

B. The documents listed in paragraph 7.01.A are attached to this Agreement (except as expressly noted otherwise above).

C. There are no Contract Documents other than those listed above in this Article 7.

D. The Contract Documents may only be amended, modified or supplemented as provided in Contract.

ARTICLE 8---REPRESENTATIONS, CERTIFICATIONS, AND STIPULATIONS

8.01 *Contractor's Representations*

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

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

4. Contractor has carefully studied the reports of explorations and tests of subsurface conditions at or adjacent to the Site and the drawings of physical conditions relating to existing surface or subsurface structures at the Site that have been identified in the Supplementary Conditions, with respect to the Technical Data in such reports and drawings.

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

6. Contractor has considered the information known to Contractor itself; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Contract Documents; and the Technical Data identified in the Supplementary Conditions or by definition, with respect to the effect of such information, observations, and Technical Data on (a) the cost, progress, and performance of the Work; (b) the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor; and (c) Contractor's safety precautions and programs.

7. Based on the information and observations referred to in the preceding paragraph, Contractor agrees that no further examinations, investigations, explorations, tests, studies, or data are necessary for the performance of the Work at the Contract Price, within the Contract Times, and in accordance with the other terms and conditions of the Contract.

8. Contractor is aware of the general nature of work to be performed by Owner and others at the site that relates to the Work as indicated in the Contract Documents.

9. Contractor has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Contractor has discovered in the Contract Documents, and of discrepancies between Site conditions and the Contract Documents, and the written resolution thereof by Engineer is acceptable to Contractor.

10. The Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.

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

8.02 *Contractor's Certifications*

A. Contractor certifies that it has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for or in executing the Contract. For the purposes of this Paragraph 8.02:

1. "corrupt practice" means the offering, giving, receiving, or soliciting of anything of value likely to influence the action of a public official in the bidding process or in the Contract execution;

2. "fraudulent practice" means an intentional misrepresentation of facts made (a) to influence the bidding process or the execution of the Contract to the detriment of Owner, (b) to establish Bid or Contract prices at artificial non-competitive levels, or (c) to deprive Owner of the benefits of free and open competition;

3. “collusive practice” means a scheme or arrangement between two or more Bidders, with or without the knowledge of Owner, a purpose of which is to establish Bid prices at artificial, non-competitive levels; and

4. “coercive practice” means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the bidding process or affect the execution of the Contract.

8.03 *Standard General Conditions*

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

THIS AREA LEFT BLANK INTENTIONALY

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

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

Owner:	Contractor:
Piedmont Triad Regional Water Authority (typed or printed name of organization)	Contractor's Legal Name (typed or printed name of organization)
By: _____ (individual's signature)	By: _____ (individual's signature)
Date: _____ (date signed)	Date: _____ (date signed)
Name: Gregory Flory (typed or printed)	Name: _____ (typed or printed)
Titled: Executive Director (typed or printed)	Titled: _____ (typed or printed)
	If Type of Entity) is a corporation, a partnership, or a joint venture, attach evidence of authority to sign)
Attest: _____ (individual's signature)	Attest: _____ (Individual's signature)
Title: _____ (typed or print)	Title: _____ (typed or print)
Address for giving notices: 7297 Adams Farm Road Randleman, NC 27317	Address for giving notices: Contractor's Street Address Contractor's City, State, Zip Code
Designated Representative: Name: _____ (typed or print)	Designated Representative: Name: _____ (typed or print)
Title: _____ (typed or print)	Title: _____ (typed or print)
Address:	Address:

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

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

END OF DOCUMENT

NOTICE TO PROCEED

Project: Water Line PTRWA – Asheboro	Date:
Owner: Piedmont Triad Regional Water Authority	Owner's Project No.: n/a
Engineer: The Wooten Company	Engineer's Project No.: 3190-L
Contractor: Contractor's Legal Name	Contractor's Project No.: Cont. Proj. ID
Contract Name: Contract Name	
Contractor's Address:	

Owner hereby notifies Contractor that the Contract Times under the above Contract will commence to run on Date of Notice to Proceed pursuant to Paragraph 4.01 of the General Conditions.

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

In accordance with the Agreement:

The number of days to achieve Substantial Completion is 240 days from the date stated above for the commencement of the Contract Times, resulting in a date for Substantial Completion of _____ _____; and the number of days to achieve readiness for final payment is 270 days from the commencement date of the Contract Times, resulting in a date for readiness for final payment of _____ _____.

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

Owner: PTRWA	Contractor: Contractor's Legal Name
By (signature): _____	By (signature): _____
Name (print): Gregory Flory	Name (print): _____
Title: Executive Director	Title: _____
Date: _____	Date: _____

copy: Engineer

END OF SECTION

PERFORMANCE BOND

Contractor	Surety
Name: Contractor's Legal Name Address (principal place of business): Contractor's Address Contractor's City, State, Zip Code	Name: Address (principal place of business):
Owner Name: Piedmont Triad Regional Water Authority Address (principal place of business): 7297 Adams Farm Road Randleman, NC 27317	Contract Description (name and location): Waterline PTRWA - Asheboro US 311 and Heath Dairy Road Contract Price: Contract Price Effective Date of Contract: Date of Contract

Bond
Bond Amount:
Date of Bond:
(date of Bond cannot be earlier than Effective Date of Contract)

Modifications to this Bond Form
___ None ___ See Paragraph 18

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

Contractor as Principal	Surety
_____ (Full formal name of Contractor)	_____ (Full formal name of Surety) (corporate seal)
By: _____ (Signature)	By: _____ (Signature) (Attach Power of Attorney)
Name: _____ (Printed or typed)	Name: _____ (Printed or typed)
Title: _____	Title: _____
Attest: _____ (Signature)	Attest: _____ (Signature)
Name: _____ (Printed or typed)	Name: _____ (Printed or typed)
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 is considered plural where applicable.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

11. Any proceeding, legal or equitable, under this Bond must be instituted in any court of competent jurisdiction in the location in which the work or part of the work is located and must be instituted within two years after a declaration of Contractor Default or within two years after the Contractor ceased working or within two years after the Surety refuses or fails to perform its obligations under this Bond, whichever occurs first. If the provisions of this paragraph are void or prohibited by law, the minimum periods of limitations available to sureties as a defense in the jurisdiction of the suit will be applicable.

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

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

14. Definitions

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

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

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

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

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

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

16. Modifications to this Bond are as follows: [Describe modification or enter “None”]

PAYMENT BOND

Contractor	Surety
Name: Contractor's Legal Name Address (principal place of business): Contractor's Address Contractor's City, State, Zip Code	Name: Address (principal place of business):
Owner	**Contract**
Name: Piedmont Triad Regional Water Authority Address (principal place of business): 7297 Adams Farm Road Randleman, NC 27317	Description (name and location): Waterline PTRWA - Asheboro US 311 and Heath Dairy Road Contract Price: Contract Price Effective Date of Contract: Date of Contract

Bond

Bond Amount:

Date of Bond:

(date of Bond cannot be earlier than Effective Date of Contract)

Modifications to this Bond Form

___ None ___ See Paragraph 18

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

Contractor as Principal	Surety
_____ (Full formal name of Contractor)	_____ (Full formal name of Surety) (corporate seal)
By: _____ (Signature)	By: _____ (Signature) (Attach Power of Attorney)
Name: _____ (Printed or typed)	Name: _____ (Printed or typed)
Title: _____	Title: _____
Attest: _____ (Signature)	Attest: _____ (Signature)
Name: _____ (Printed or typed)	Name: _____ (Printed or typed)
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 is 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 will arise after the Owner has promptly notified the Contractor and the Surety (at the address described in Paragraph 13) of claims, demands, liens, or suits against the Owner or the Owner's property by any person or entity seeking payment for labor, materials, or equipment furnished for use in the performance of the Construction Contract, and tendered defense of such claims, demands, liens, or suits to the Contractor and the Surety.

4. When the Owner has satisfied the conditions in Paragraph 3, the Surety shall promptly and at the Surety's expense defend, indemnify, and hold harmless the Owner against a duly tendered claim, demand, lien, or suit.

5. The Surety's obligations to a Claimant under this Bond will arise after the following:

    5.1. Claimants who do not have a direct contract with the Contractor

        5.1.1. have furnished a written notice of non-payment to the Contractor, stating with substantial accuracy the amount claimed and the name of the party to whom the materials were, or equipment was, furnished or supplied or for whom the labor was done or performed, within ninety (90) days after having last performed labor or last furnished materials or equipment included in the Claim; and

        5.1.2. have sent a Claim to the Surety (at the address described in Paragraph 13).

    5.2. Claimants who are employed by or have a direct contract with the Contractor have sent a Claim to the Surety (at the address described in Paragraph 13).

6. If a notice of non-payment required by Paragraph 5.1.1 is given by the Owner to the Contractor, that is sufficient to satisfy a Claimant's obligation to furnish a written notice of non-payment under Paragraph 5.1.1.

7. When a Claimant has satisfied the conditions of Paragraph 5.1 or 5.2, whichever is applicable, the Surety shall promptly and at the Surety's expense take the following actions:

    7.1. Send an answer to the Claimant, with a copy to the Owner, within sixty (60) days after receipt of the Claim, stating the amounts that are undisputed and the basis for challenging any amounts that are disputed; and

    7.2. Pay or arrange for payment of any undisputed amounts.

    7.3. The Surety's failure to discharge its obligations under Paragraph 7.1 or 7.2 will not be deemed to constitute a waiver of defenses the Surety or Contractor may have or acquire as to a Claim, except as to undisputed amounts for which the Surety and Claimant have reached agreement. If, however, the Surety fails to discharge its obligations under Paragraph 7.1 or 7.2, the Surety shall indemnify the Claimant for the reasonable attorney's fees the Claimant incurs thereafter to recover any sums found to be due and owing to the Claimant.

8. The Surety's total obligation will not exceed the amount of this Bond, plus the amount of reasonable attorney's fees provided under Paragraph 7.3, and the amount of this Bond will be credited for any payments made in good faith by the Surety.

9. Amounts owed by the Owner to the Contractor under the Construction Contract will be used for the performance of the Construction Contract and to satisfy claims, if any, under any construction performance bond. By the Contractor furnishing and the Owner accepting this Bond, they agree that all funds earned by the Contractor in the performance of the Construction Contract are dedicated to satisfying obligations of the Contractor and Surety under this Bond, subject to the Owner's priority to use the funds for the completion of the work.

10. The Surety shall not be liable to the Owner, Claimants, or others for obligations of the Contractor that are unrelated to the Construction Contract. The Owner shall not be liable for the payment of any costs or expenses of any Claimant under this Bond, and shall have under this Bond no obligation to make payments to or give notice on behalf of Claimants, or otherwise have any obligations to Claimants under this Bond.

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

12. No suit or action will be commenced by a Claimant under this Bond other than in a court of competent jurisdiction in the state in which the project that is the subject of the Construction Contract is located or after the expiration of one year from the date (1) on which the Claimant sent a Claim to the Surety pursuant to Paragraph 5.1.2 or 5.2, or (2) on which the last labor or service was performed by anyone or the last materials or equipment were furnished by anyone under the Construction Contract, whichever of (1) or (2) first occurs. If the provisions of this paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit will be applicable.

13. Notice and Claims to the Surety, the Owner, or the Contractor must be mailed or delivered to the address shown on the page on which their signature appears. Actual receipt of notice or Claims, however accomplished, will be sufficient compliance as of the date received.

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

15. Upon requests by any person or entity appearing to be a potential beneficiary of this Bond, the Contractor and Owner shall promptly furnish a copy of this Bond or shall permit a copy to be made.

16. Definitions

    16.1. Claim—A written statement by the Claimant including at a minimum:
        16.1.1. The name of the Claimant;
        16.1.2. The name of the person for whom the labor was done, or materials or equipment furnished;
        16.1.3. A copy of the agreement or purchase order pursuant to which labor, materials, or equipment was furnished for use in the performance of the Construction Contract;
        16.1.4. A brief description of the labor, materials, or equipment furnished;
        16.1.5. The date on which the Claimant last performed labor or last furnished materials or equipment for use in the performance of the Construction Contract;

16.1.6. The total amount earned by the Claimant for labor, materials, or equipment furnished as of the date of the Claim;

16.1.7. The total amount of previous payments received by the Claimant; and

16.1.8. The total amount due and unpaid to the Claimant for labor, materials, or equipment furnished as of the date of the Claim.

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

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

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

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

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

18. Modifications to this Bond are as follows:

SECTION 00 61 18

POWER OF ATTORNEY, PB AND PB

PAGE FOR ATTACHING

PERFORMANCE & PAYMENT BONDS

POWER OF ATTORNEY

END OF SECTION

SECTION 00 62 16

CERTIFICATE OF INSURANCE

PAGE FOR ATTACHING

CERTIFICATE OF INSURANCE

END OF SECTION

SECTION 00 62 18

CERTIFICATE OF OWNER'S ATTORNEY AND PREAUDIT

ATTORNEY''S CERTIFICATE

I, the undersigned, _____, the duly authorized and acting legal representative of Piedmont Triad Regional Water Authority, do hereby certify as follows:

I have examined the attached Contract(s) and Performance and Payment Bonds and the manner of execution thereof, and I am of the opinion that each of the aforesaid agreements is adequate and has been duly executed by the proper parties thereto acting through their duly authorized representatives; that said representatives have full power and authority to execute said agreements on behalf of the respective parties named thereon; and that the foregoing agreements constitute valid and legally binding obligations upon the parties executing the same in accordance with terms, conditions, and provisions thereof.

Date:_____

By: _____
Signature

PRE-AUDIT STATEMENT

This instrument has been pre-audited in the manner required by the Local Government Budget and Fiscal Control Act.

Piedmont Triad Regional Water Authority

Date:_____

By:: _____
Signature

Title: _____

END OF SECTION

EJCDC
ENGINEERS JOINT CONTRACT DOCUMENTS COMMITTEE

Contractor's Application for Payment No.

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

Application For Payment

Change Order Summary

Approved Change Orders		
Number	Additions	Deductions
TOTALS		
NET CHANGE BY CHANGE ORDERS		

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

Contractor's Certification

The undersigned Contractor certifies that to the best of its knowledge: (1) all previous progress payments received from Owner on account of Work done under the Contract have been applied on account to discharge Contractor's legitimate obligations incurred in connection with Work covered by prior Applications for Payment; (2) title of all Work, materials and equipment incorporated in said Work or otherwise listed in or covered by this Application for Payment will pass to Owner at time of payment free and clear of all Liens, security interests and encumbrances (except such as are covered by a Bond acceptable to Owner indemnifying Owner against any such Liens, security interest or encumbrances); and (3) all Work covered by this Application for Payment is in accordance with the Contract Documents and is not defective.

By:	Date:

Payment of: $ _____
(Line 8 or other - attach explanation of the other amount)

is recommended by: _____ _____
(Engineer) (Date)

Payment of: $ _____
(Line 8 or other - attach explanation of the other amount)

is approved by: _____ _____
(Owner) (Date)

Approved by: _____ _____
Funding Agency (if applicable) (Date)

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Progress Estimate - Lump Sum Work

Contractor's Application

For (Contract):	Application Number:
Application Period:	Application Date:

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

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Progress Estimate - Unit Price Work

Contractor's Application

For (Contract):		Application Number:
Application Period:		Application Date:

A Contract Items						B Work Completed from Previous Applications		C Work Completed this Application		D Work Completed to Date		E	F		
Item		Bid Item Quantity	Unit	Unit Price	Bid Item Value ($)	Quantity	Amount	Quantity	Amount	Quantity	Amount	Materials Presently Stored (not in C)	Total Completed and Stored to Date (D + E)	% (F / A)	Balance to Finish (B - F)
Bid Item No.	Description														
1							$ -	8	$ -		$ -				
2							$ -		$ -		$ -				
3							$ -	1	$ -		$ -				
4							$ -		$ -		$ -				
5							$ -	1	$ -		$ -				
6							$ -	1	$ -		$ -				
7							$ -		$ -		$ -				
8							$ -		$ -		$ -				
9							$ -		$ -		$ -				
10							$ -		$ -		$ -				
11							$ -		$ -		$ -				
12							$ -		$ -		$ -				
13							$ -		$ -		$ -				
14							$ -		$ -		$ -				
15							$ -		$ -		$ -				
16							$ -		$ -		$ -				
17							$ -		$ -		$ -				
18							$ -		$ -		$ -				
19							$ -		$ -		$ -				
20							$ -		$ -		$ -				
21							$ -		$ -		$ -				
22							$ -		$ -		$ -				
23							$ -		$ -		$ -				
24							$ -		$ -		$ -				
25							$ -		$ -		$ -				
26							$ -		$ -		$ -				
27							$ -		$ -		$ -				
28							$ -		$ -		$ -				
29							$ -		$ -		$ -				
30							$ -		$ -		$ -				
31							$ -		$ -		$ -				
32							$ -		$ -		$ -				
33							$ -		$ -		$ -				
34							$ -		$ -		$ -				
35							$ -		$ -		$ -				
36							$ -		$ -		$ -				
37							$ -		$ -		$ -				
38							$ -		$ -		$ -				
39							$ -	1	$ -	1	$ -				
	Totals						**$ -**								

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Stored Material Summary

Contractor's Application

For (Contract):								Application Number:			
Application Period:								Application Date:			
A		B	C		D		E		F		G
Bid Item No.	Supplier Invoice No.	Submittal No. (with Specification Section No.)	Storage Location	Description of Materials or Equpment Stored	Stored Previously		Amount Stored this Month ($)	Subtotal Amount Completed and Stored to Date (D + E)	Incorporated in Work		Materials Remaining in Storage ($) (D + E - F)
					Date Placed into Storage (Month/Year)	Amount ($)			Date (Month/ Year)	Amount ($)	
				Totals							

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NORTH CAROLINA SALES TAX AND USE REPORT

(Paid During This Estimate Period)

PAGE ____ of ____

PROJECT _____ _____ COUNTY ESTIMATE NO. _____

CONTRACTOR _____ PERIOD ENDING _____

DATE	VENDOR NAME	INVOICE NUMBER	INVOICE AMOUNT	TYPE OF PROPERTY	STATE TAX	COUNTY TAX	TOTAL TAX	COUNTY OF SALE*

I certify that the above-listed vendors were paid sales tax upon purchase of building materials during the period covered by the construction estimate, and the property upon which such taxes were paid with or will be used in the performance of this contract. No tax on purchases or rentals of supplies, tools and/or equipment is included in the above list. All of the material above became a part of or is annexed to the building(s) or structure(s) being erected, altered or repaired. I certify that, to the best of my knowledge, the information provided here is true, correct, and complete

Sworn to and subscribed to before me this _____ day of _____, 20____.

_____
Notary Public

My commission expires: _____

Seal

_____
Contractor's Signature

_____
Print or Type Name of Above

*If this is an out-of-state vendor, the County of Sale should be the county to which the merchandise was shipped.

SUBMIT WITH YOUR BILLING

STATE OF NORTH CAROLINA
COUNTY SALES AND USE TAX REPORT
SUMMARY TOTALS AND CERTIFICATION

CONTRACTOR: _____ Page __1____ of _____

PROJECT: _____ FOR PERIOD: _____

	TOTAL FOR COUNTY OF:	TOTAL FOR COUNTY OF:	TOTAL FOR COUNTY OF:	TOTAL FOR COUNTY OF:	TOTAL FOR COUNTY OF:	TOTAL FOR COUNTY OF:	TOTAL ALL COUNTIES
CONTRACTOR							
SUBCONTRACTOR(S)*							
COUNTY TOTAL							

* Attach subcontractor(s) report(s)
** Must balance with Detail Sheet(s)

I certify that the above figures do not include any tax paid on supplies, tools and equipment which were used to perform this contract and only includes those building materials, supplies, fixtures and equipment which actually became a part of or annexed to the building or structure. I certify that, to the best of my knowledge, the information provided here is true, correct, and complete.

Sworn to and subscribed before me,

This the _____ day of _____, 20____

_____
Signed

_____
Notary Public

_____
Print or Type Name of Above

My Commission Expires: _____

Seal

NOTE:
This certified statement may be subject to audit.

CERTIFICATE OF SUBSTANTIAL COMPLETION

Owner: Piedmont Triad Regional Water Authority	Owner's Project No.:
Engineer: The Wooten Company	Engineer's Project No.: 3190-L
Contractor: Contractor's Legal Name	Contractor's Project No.:
Project: Water Line PTRWA - Asheboro	
Contract Name:	

This _____ Preliminary _____ Final Certificate of Substantial Completion applies to:

_____ All Work _____ The following specified portions of the Work:

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

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

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

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

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

Amendments to Owner's Responsibilities: ____ None ____ As follows:

Amendments to Contractor's Responsibilities: _____ None _____ As follows:

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

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

copy: Engineer

By (signature):
Name (printed):
Title:

ARTICLE 1—DEFINITIONS AND TERMINOLOGY

1.01 Defined Terms

A. Wherever used in the Bidding Requirements or Contract Documents, a term printed with initial capital letters, including the term's singular and plural forms, will have the meaning indicated in the definitions below. In addition to terms specifically defined, terms with initial capital letters in the Contract Documents include references to identified articles and paragraphs, and the titles of other documents or forms.

1. *Addenda*—Written or graphic instruments issued prior to the opening of Bids which clarify, correct, or change the Bidding Requirements or the proposed Contract Documents.

2. *Agreement*—The written instrument, executed by Owner and Contractor, that sets forth the Contract Price and Contract Times, identifies the parties and the Engineer, and designates the specific items that are Contract Documents.

3. *Application for Payment*—The document prepared by Contractor, in a form acceptable to Engineer, to request progress or final payments, and which is to be accompanied by such supporting documentation as is required by the Contract Documents.

4. *Bid*—The offer of a Bidder submitted on the prescribed form setting forth the prices for the Work to be performed.

5. *Bidder*—An individual or entity that submits a Bid to Owner.

6. *Bidding Documents*—The Bidding Requirements, the proposed Contract Documents, and all Addenda.

7. *Bidding Requirements*—The Advertisement or invitation to bid, Instructions to Bidders, Bid Bond or other Bid security, if any, the Bid Form, and the Bid with any attachments.

8. *Change Order*—A document which is signed by Contractor and Owner and authorizes an addition, deletion, or revision in the Work or an adjustment in the Contract Price or the Contract Times, or other revision to the Contract, issued on or after the Effective Date of the Contract.

9. *Change Proposal*—A written request by Contractor, duly submitted in compliance with the procedural requirements set forth herein, seeking an adjustment in Contract Price or Contract Times; contesting an initial decision by Engineer concerning the requirements of the Contract Documents or the acceptability of Work under the Contract Documents; challenging a set-off against payments due; or seeking other relief with respect to the terms of the Contract.

10. *Claim*
    a. A demand or assertion by Owner directly to Contractor, duly submitted in compliance with the procedural requirements set forth herein, seeking an adjustment of Contract Price or Contract Times; contesting an initial decision by Engineer concerning the requirements of the Contract Documents or the acceptability of Work under the Contract Documents; contesting Engineer's decision regarding a Change Proposal;

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seeking resolution of a contractual issue that Engineer has declined to address; or seeking other relief with respect to the terms of the Contract.

b. A demand or assertion by Contractor directly to Owner, duly submitted in compliance with the procedural requirements set forth herein, contesting Engineer's decision regarding a Change Proposal, or seeking resolution of a contractual issue that Engineer has declined to address.

c. A demand or assertion by Owner or Contractor, duly submitted in compliance with the procedural requirements set forth herein, made pursuant to Paragraph 12.01.A.4, concerning disputes arising after Engineer has issued a recommendation of final payment.

d. A demand for money or services by a third party is not a Claim.

11. *Constituent of Concern*—Asbestos, petroleum, radioactive materials, polychlorinated biphenyls (PCBs), lead-based paint (as defined by the HUD/EPA standard), hazardous waste, and any substance, product, waste, or other material of any nature whatsoever that is or becomes listed, regulated, or addressed pursuant to Laws and Regulations regulating, relating to, or imposing liability or standards of conduct concerning, any hazardous, toxic, or dangerous waste, substance, or material.

12. *Contract*—The entire and integrated written contract between Owner and Contractor concerning the Work.

13. *Contract Documents*—Those items so designated in the Agreement, and which together comprise the Contract.

14. *Contract Price*—The money that Owner has agreed to pay Contractor for completion of the Work in accordance with the Contract Documents.

15. *Contract Times*—The number of days or the dates by which Contractor shall: (a) achieve Milestones, if any; (b) achieve Substantial Completion; and (c) complete the Work.

16. *Contractor*—The individual or entity with which Owner has contracted for performance of the Work.

17. *Cost of the Work*—See Paragraph 13.01 for definition.

18. *Drawings*—The part of the Contract that graphically shows the scope, extent, and character of the Work to be performed by Contractor.

19. *Effective Date of the Contract*—The date, indicated in the Agreement, on which the Contract becomes effective.

20. *Electronic Document*—Any Project-related correspondence, attachments to correspondence, data, documents, drawings, information, or graphics, including but not limited to Shop Drawings and other Submittals, that are in an electronic or digital format.

21. *Electronic Means*—Electronic mail (email), upload/download from a secure Project website, or other communications methods that allow: (a) the transmission or communication of Electronic Documents; (b) the documentation of transmissions, including sending and receipt; (c) printing of the transmitted Electronic Document by the recipient; (d) the storage and archiving of the Electronic Document by sender and recipient; and (e) the use by recipient of the Electronic Document for purposes permitted by this

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Contract. Electronic Means does not include the use of text messaging, or of Facebook, Twitter, Instagram, or similar social media services for transmission of Electronic Documents.

22. *Engineer*—The individual or entity named as such in the Agreement.

23. *Field Order*—A written order issued by Engineer which requires minor changes in the Work but does not change the Contract Price or the Contract Times.

24. *Hazardous Environmental Condition*—The presence at the Site of Constituents of Concern in such quantities or circumstances that may present a danger to persons or property exposed thereto.
    a. The presence at the Site of materials that are necessary for the execution of the Work, or that are to be incorporated into the Work, and that are controlled and contained pursuant to industry practices, Laws and Regulations, and the requirements of the Contract, is not a Hazardous Environmental Condition.
    b. The presence of Constituents of Concern that are to be removed or remediated as part of the Work is not a Hazardous Environmental Condition.
    c. The presence of Constituents of Concern as part of the routine, anticipated, and obvious working conditions at the Site, is not a Hazardous Environmental Condition.

25. *Laws and Regulations; Laws or Regulations*—Any and all applicable laws, statutes, rules, regulations, ordinances, codes, and binding decrees, resolutions, and orders of any and all governmental bodies, agencies, authorities, and courts having jurisdiction.

26. *Liens*—Charges, security interests, or encumbrances upon Contract-related funds, real property, or personal property.

27. *Milestone*—A principal event in the performance of the Work that the Contract requires Contractor to achieve by an intermediate completion date, or by a time prior to Substantial Completion of all the Work.

28. *Notice of Award*—The written notice by Owner to a Bidder of Owner's acceptance of the Bid.

29. *Notice to Proceed*—A written notice by Owner to Contractor fixing the date on which the Contract Times will commence to run and on which Contractor shall start to perform the Work.

30. *Owner*—The individual or entity with which Contractor has contracted regarding the Work, and which has agreed to pay Contractor for the performance of the Work, pursuant to the terms of the Contract.

31. *Progress Schedule*—A schedule, prepared and maintained by Contractor, describing the sequence and duration of the activities comprising Contractor's plan to accomplish the Work within the Contract Times.

32. *Project*—The total undertaking to be accomplished for Owner by engineers, contractors, and others, including planning, study, design, construction, testing, commissioning, and start-up, and of which the Work to be performed under the Contract Documents is a part.

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33. *Resident Project Representative*—The authorized representative of Engineer assigned to assist Engineer at the Site. As used herein, the term Resident Project Representative (RPR) includes any assistants or field staff of Resident Project Representative.

34. *Samples*—Physical examples of materials, equipment, or workmanship that are representative of some portion of the Work and that establish the standards by which such portion of the Work will be judged.

35. *Schedule of Submittals*—A schedule, prepared and maintained by Contractor, of required submittals and the time requirements for Engineer's review of the submittals.

36. *Schedule of Values*—A schedule, prepared and maintained by Contractor, allocating portions of the Contract Price to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.

37. *Shop Drawings*—All drawings, diagrams, illustrations, schedules, and other data or information that are specifically prepared or assembled by or for Contractor and submitted by Contractor to illustrate some portion of the Work. Shop Drawings, whether approved or not, are not Drawings and are not Contract Documents.

38. *Site*—Lands or areas indicated in the Contract Documents as being furnished by Owner upon which the Work is to be performed, including rights-of-way and easements, and such other lands or areas furnished by Owner which are designated for the use of Contractor.

39. *Specifications*—The part of the Contract that consists of written requirements for materials, equipment, systems, standards, and workmanship as applied to the Work, and certain administrative requirements and procedural matters applicable to the Work.

40. *Subcontractor*—An individual or entity having a direct contract with Contractor or with any other Subcontractor for the performance of a part of the Work.

41. *Submittal*—A written or graphic document, prepared by or for Contractor, which the Contract Documents require Contractor to submit to Engineer, or that is indicated as a Submittal in the Schedule of Submittals accepted by Engineer. Submittals may include Shop Drawings and Samples; schedules; product data; Owner-delegated designs; sustainable design information; information on special procedures; testing plans; results of tests and evaluations, source quality-control testing and inspections, and field or Site quality-control testing and inspections; warranties and certifications; Suppliers' instructions and reports; records of delivery of spare parts and tools; operations and maintenance data; Project photographic documentation; record documents; and other such documents required by the Contract Documents. Submittals, whether or not approved or accepted by Engineer, are not Contract Documents. Change Proposals, Change Orders, Claims, notices, Applications for Payment, and requests for interpretation or clarification are not Submittals.

42. *Substantial Completion*—The time at which the Work (or a specified part thereof) has progressed to the point where, in the opinion of Engineer, the Work (or a specified part thereof) is sufficiently complete, in accordance with the Contract Documents, so that the Work (or a specified part thereof) can be utilized for the purposes for which it is intended. The terms "substantially complete" and "substantially completed" as applied to all or part of the Work refer to Substantial Completion of such Work.

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43. *Successful Bidder*—The Bidder to which the Owner makes an award of contract.

44. *Supplementary Conditions*—The part of the Contract that amends or supplements these General Conditions.

45. *Supplier*—A manufacturer, fabricator, supplier, distributor, or vendor having a direct contract with Contractor or with any Subcontractor to furnish materials or equipment to be incorporated in the Work by Contractor or a Subcontractor.

46. *Technical Data*
    a. Those items expressly identified as Technical Data in the Supplementary Conditions, with respect to either (1) existing subsurface conditions at or adjacent to the Site, or existing physical conditions at or adjacent to the Site including existing surface or subsurface structures (except Underground Facilities) or (2) Hazardous Environmental Conditions at the Site.
    b. If no such express identifications of Technical Data have been made with respect to conditions at the Site, then Technical Data is defined, with respect to conditions at the Site under Paragraphs 5.03, 5.04, and 5.06, as the data contained in boring logs, recorded measurements of subsurface water levels, assessments of the condition of subsurface facilities, laboratory test results, and other factual, objective information regarding conditions at the Site that are set forth in any geotechnical, environmental, or other Site or facilities conditions report prepared for the Project and made available to Contractor.
    c. Information and data regarding the presence or location of Underground Facilities are not intended to be categorized, identified, or defined as Technical Data, and instead Underground Facilities are shown or indicated on the Drawings.

47. *Underground Facilities*—All active or not-in-service underground lines, pipelines, conduits, ducts, encasements, cables, wires, manholes, vaults, tanks, tunnels, or other such facilities or systems at the Site, including but not limited to those facilities or systems that produce, transmit, distribute, or convey telephone or other communications, cable television, fiber optic transmissions, power, electricity, light, heat, gases, oil, crude oil products, liquid petroleum products, water, steam, waste, wastewater, storm water, other liquids or chemicals, or traffic or other control systems. An abandoned facility or system is not an Underground Facility.

48. *Unit Price Work*—Work to be paid for on the basis of unit prices.

49. *Work*—The entire construction or the various separately identifiable parts thereof required to be provided under the Contract Documents. Work includes and is the result of performing or providing all labor, services, and documentation necessary to produce such construction; furnishing, installing, and incorporating all materials and equipment into such construction; and may include related services such as testing, start-up, and commissioning, all as required by the Contract Documents.

50. *Work Change Directive*—A written directive to Contractor issued on or after the Effective Date of the Contract, signed by Owner and recommended by Engineer, ordering an addition, deletion, or revision in the Work.

1.02 *Terminology*

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A. The words and terms discussed in Paragraphs 1.02.B, C, D, and E are not defined terms that require initial capital letters, but, when used in the Bidding Requirements or Contract Documents, have the indicated meaning.

B. *Intent of Certain Terms or Adjectives*: The Contract Documents include the terms "as allowed," "as approved," "as ordered," "as directed" or terms of like effect or import to authorize an exercise of professional judgment by Engineer. In addition, the adjectives "reasonable," "suitable," "acceptable," "proper," "satisfactory," or adjectives of like effect or import are used to describe an action or determination of Engineer as to the Work. It is intended that such exercise of professional judgment, action, or determination will be solely to evaluate, in general, the Work for compliance with the information in the Contract Documents and with the design concept of the Project as a functioning whole as shown or indicated in the Contract Documents (unless there is a specific statement indicating otherwise). The use of any such term or adjective is not intended to and shall not be effective to assign to Engineer any duty or authority to supervise or direct the performance of the Work, or any duty or authority to undertake responsibility contrary to the provisions of Article 10 or any other provision of the Contract Documents.

C. *Day*: The word "day" means a calendar day of 24 hours measured from midnight to the next midnight.

D. *Defective*: The word "defective," when modifying the word "Work," refers to Work that is unsatisfactory, faulty, or deficient in that it:

1. does not conform to the Contract Documents;

2. does not meet the requirements of any applicable inspection, reference standard, test, or approval referred to in the Contract Documents; or

3. has been damaged prior to Engineer's recommendation of final payment (unless responsibility for the protection thereof has been assumed by Owner at Substantial Completion in accordance with Paragraph 15.03 or Paragraph 15.04).

E. *Furnish, Install, Perform, Provide*

1. The word "furnish," when used in connection with services, materials, or equipment, means to supply and deliver said services, materials, or equipment to the Site (or some other specified location) ready for use or installation and in usable or operable condition.

2. The word "install," when used in connection with services, materials, or equipment, means to put into use or place in final position said services, materials, or equipment complete and ready for intended use.

3. The words "perform" or "provide," when used in connection with services, materials, or equipment, means to furnish and install said services, materials, or equipment complete and ready for intended use.

4. If the Contract Documents establish an obligation of Contractor with respect to specific services, materials, or equipment, but do not expressly use any of the four words "furnish," "install," "perform," or "provide," then Contractor shall furnish and install said services, materials, or equipment complete and ready for intended use.

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F. *Contract Price or Contract Times*: References to a change in "Contract Price or Contract Times" or "Contract Times or Contract Price" or similar, indicate that such change applies to (1) Contract Price, (2) Contract Times, or (3) both Contract Price and Contract Times, as warranted, even if the term "or both" is not expressed.

G. Unless stated otherwise in the Contract Documents, words or phrases that have a well-known technical or construction industry or trade meaning are used in the Contract Documents in accordance with such recognized meaning.

ARTICLE 2—PRELIMINARY MATTERS

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

A. Performance and Payment Bonds: When Contractor delivers the signed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner the performance bond and payment bond (if the Contract requires Contractor to furnish such bonds).

B. Evidence of Contractor's Insurance: When Contractor delivers the signed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner, with copies to each additional insured (as identified in the Contract), the certificates, endorsements, and other evidence of insurance required to be provided by Contractor in accordance with Article 6, except to the extent the Supplementary Conditions expressly establish other dates for delivery of specific insurance policies.

C. Evidence of Owner's Insurance: After receipt of the signed counterparts of the Agreement and all required bonds and insurance documentation, Owner shall promptly deliver to Contractor, with copies to each additional insured (as identified in the Contract), the certificates and other evidence of insurance required to be provided by Owner under Article 6.

2.02 *Copies of Documents*

A. Owner shall furnish to Contractor four printed copies of the Contract (including one fully signed counterpart of the Agreement), and one copy in electronic portable document format (PDF). Additional printed copies will be furnished upon request at the cost of reproduction.

B. Owner shall maintain and safeguard at least one original printed record version of the Contract, including Drawings and Specifications signed and sealed by Engineer and other design professionals. Owner shall make such original printed record version of the Contract available to Contractor for review. Owner may delegate the responsibilities under this provision to Engineer.

2.03 *Before Starting Construction*

A. Preliminary Schedules: Within 10 days after the Effective Date of the Contract (or as otherwise required by the Contract Documents), Contractor shall submit to Engineer for timely review:

1. a preliminary Progress Schedule indicating the times (numbers of days or dates) for starting and completing the various stages of the Work, including any Milestones specified in the Contract;

2. a preliminary Schedule of Submittals; and

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3. a preliminary Schedule of Values for all of the Work which includes quantities and prices of items which when added together equal the Contract Price and subdivides the Work into component parts in sufficient detail to serve as the basis for progress payments during performance of the Work. Such prices will include an appropriate amount of overhead and profit applicable to each item of Work.

2.04 *Preconstruction Conference; Designation of Authorized Representatives*

A. Before any Work at the Site is started, a conference attended by Owner, Contractor, Engineer, and others as appropriate will be held to establish a working understanding among the parties as to the Work, and to discuss the schedules referred to in Paragraph 2.03.A, procedures for handling Shop Drawings, Samples, and other Submittals, processing Applications for Payment, electronic or digital transmittals, and maintaining required records.

B. At this conference Owner and Contractor each shall designate, in writing, a specific individual to act as its authorized representative with respect to the services and responsibilities under the Contract. Such individuals shall have the authority to transmit and receive information, render decisions relative to the Contract, and otherwise act on behalf of each respective party.

2.05 *Acceptance of Schedules*

A. At least 10 days before submission of the first Application for Payment a conference, attended by Contractor, Engineer, and others as appropriate, will be held to review the schedules submitted in accordance with Paragraph 2.03.A. No progress payment will be made to Contractor until acceptable schedules are submitted to Engineer.

1. The Progress Schedule will be acceptable to Engineer if it provides an orderly progression of the Work to completion within the Contract Times. Such acceptance will not impose on Engineer responsibility for the Progress Schedule, for sequencing, scheduling, or progress of the Work, nor interfere with or relieve Contractor from Contractor's full responsibility therefor.

2. Contractor's Schedule of Submittals will be acceptable to Engineer if it provides a workable arrangement for reviewing and processing the required submittals.

3. Contractor's Schedule of Values will be acceptable to Engineer as to form and substance if it provides a reasonable allocation of the Contract Price to the component parts of the Work.

4. If a schedule is not acceptable, Contractor will have an additional 10 days to revise and resubmit the schedule.

2.06 *Electronic Transmittals*

A. Except as otherwise stated elsewhere in the Contract, the Owner, Engineer, and Contractor may send, and shall accept, Electronic Documents transmitted by Electronic Means.

B. If the Contract does not establish protocols for Electronic Means, then Owner, Engineer, and Contractor shall jointly develop such protocols.

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C. Subject to any governing protocols for Electronic Means, when transmitting Electronic Documents by Electronic Means, the transmitting party makes no representations as to long-term compatibility, usability, or readability of the Electronic Documents resulting from the recipient's use of software application packages, operating systems, or computer hardware differing from those used in the drafting or transmittal of the Electronic Documents.

ARTICLE 3—CONTRACT DOCUMENTS: INTENT, REQUIREMENTS, REUSE

3.01 *Intent*

A. The Contract Documents are complementary; what is required by one Contract Document is as binding as if required by all.

B. It is the intent of the Contract Documents to describe a functionally complete Project (or part thereof) to be constructed in accordance with the Contract Documents.

C. Unless otherwise stated in the Contract Documents, if there is a discrepancy between the electronic versions of the Contract Documents (including any printed copies derived from such electronic versions) and the printed record version, the printed record version will govern. (2007 3.06.A)

D. The Contract supersedes prior negotiations, representations, and agreements, whether written or oral.

E. Engineer will issue clarifications and interpretations of the Contract Documents as provided herein.

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

G. Nothing in the Contract Documents creates:

1. any contractual relationship between Owner or Engineer and any Subcontractor, Supplier, or other individual or entity performing or furnishing any of the Work, for the benefit of such Subcontractor, Supplier, or other individual or entity; or

2. any obligation on the part of Owner or Engineer to pay or to see to the payment of any money due any such Subcontractor, Supplier, or other individual or entity, except as may otherwise be required by Laws and Regulations.

3.02 *Reference Standards*

A. Standards Specifications, Codes, Laws and Regulations

1. Reference in the Contract Documents to standard specifications, manuals, reference standards, or codes of any technical society, organization, or association, or to Laws or Regulations, whether such reference be specific or by implication, means the standard specification, manual, reference standard, code, or Laws or Regulations in effect at the time of opening of Bids (or on the Effective Date of the Contract if there were no Bids), except as may be otherwise specifically stated in the Contract Documents.

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2. No provision of any such standard specification, manual, reference standard, or code, and no instruction of a Supplier, will be effective to change the duties or responsibilities of Owner, Contractor, or Engineer from those set forth in the part of the Contract Documents prepared by or for Engineer. No such provision or instruction shall be effective to assign to Owner or Engineer any duty or authority to supervise or direct the performance of the Work, or any duty or authority to undertake responsibility inconsistent with the provisions of the part of the Contract Documents prepared by or for Engineer.

3.03 *Reporting and Resolving Discrepancies*

A. *Reporting Discrepancies*

1. *Contractor's Verification of Figures and Field Measurements:* Before undertaking each part of the Work, Contractor shall carefully study the Contract Documents, and check and verify pertinent figures and dimensions therein, particularly with respect to applicable field measurements. Contractor shall promptly report in writing to Engineer any conflict, error, ambiguity, or discrepancy that Contractor discovers, or has actual knowledge of, and shall not proceed with any Work affected thereby until the conflict, error, ambiguity, or discrepancy is resolved by a clarification or interpretation by Engineer, or by an amendment or supplement to the Contract issued pursuant to Paragraph 11.01.

2. *Contractor's Review of Contract Documents:* If, before or during the performance of the Work, Contractor discovers any conflict, error, ambiguity, or discrepancy within the Contract Documents, or between the Contract Documents and (a) any applicable Law or Regulation, (b) actual field conditions, (c) any standard specification, manual, reference standard, or code, or (d) any instruction of any Supplier, then Contractor shall promptly report it to Engineer in writing. Contractor shall not proceed with the Work affected thereby (except in an emergency as required by Paragraph 7.15) until the conflict, error, ambiguity, or discrepancy is resolved, by a clarification or interpretation by Engineer, or by an amendment or supplement to the Contract issued pursuant to Paragraph 11.01.

3. Contractor shall not be liable to Owner or Engineer for failure to report any conflict, error, ambiguity, or discrepancy in the Contract Documents unless Contractor had actual knowledge thereof.

B. *Resolving Discrepancies*

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

3.04 *Requirements of the Contract Documents*

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

B. Engineer will, with reasonable promptness, render a written clarification, interpretation, or decision on the issue submitted, or initiate an amendment or supplement to the Contract Documents. Engineer's written clarification, interpretation, or decision will be final and binding on Contractor, unless it appeals by submitting a Change Proposal, and on Owner, unless it appeals by filing a Claim.

C. If a submitted matter in question concerns terms and conditions of the Contract Documents that do not involve (1) the performance or acceptability of the Work under the Contract Documents, (2) the design (as set forth in the Drawings, Specifications, or otherwise), or (3) other engineering or technical matters, then Engineer will promptly notify Owner and Contractor in writing that Engineer is unable to provide a decision or interpretation. If Owner and Contractor are unable to agree on resolution of such a matter in question, either party may pursue resolution as provided in Article 12.

3.05 *Reuse of Documents*

A. Contractor and its Subcontractors and Suppliers shall not:

1. have or acquire any title to or ownership rights in any of the Drawings, Specifications, or other documents (or copies of any thereof) prepared by or bearing the seal of Engineer or its consultants, including electronic media versions, or reuse any such Drawings, Specifications, other documents, or copies thereof on extensions of the Project or any other project without written consent of Owner and Engineer and specific written verification or adaptation by Engineer; or

2. have or acquire any title or ownership rights in any other Contract Documents, reuse any such Contract Documents for any purpose without Owner's express written consent, or violate any copyrights pertaining to such Contract Documents.

B. The prohibitions of this Paragraph 3.05 will survive final payment, or termination of the Contract. Nothing herein precludes Contractor from retaining copies of the Contract Documents for record purposes.

ARTICLE 4—COMMENCEMENT AND PROGRESS OF THE WORK

4.01 *Commencement of Contract Times; Notice to Proceed*

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

4.02 *Starting the Work*

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

4.03 *Reference Points*

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

4.04 *Progress Schedule*

A. Contractor shall adhere to the Progress Schedule established in accordance with Paragraph 2.05 as it may be adjusted from time to time as provided below.

1. Contractor shall submit to Engineer for acceptance (to the extent indicated in Paragraph 2.05) proposed adjustments in the Progress Schedule that will not result in changing the Contract Times.

2. Proposed adjustments in the Progress Schedule that will change the Contract Times must be submitted in accordance with the requirements of Article 11.

B. Contractor shall carry on the Work and adhere to the Progress Schedule during all disputes or disagreements with Owner. No Work will be delayed or postponed pending resolution of any disputes or disagreements, or during any appeal process, except as permitted by Paragraph 16.04, or as Owner and Contractor may otherwise agree in writing.

4.05 *Delays in Contractor's Progress*

A. If Owner, Engineer, or anyone for whom Owner is responsible, delays, disrupts, or interferes with the performance or progress of the Work, then Contractor shall be entitled to an equitable adjustment in Contract Price or Contract Times.

B. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for delay, disruption, or interference caused by or within the control of Contractor. Delay, disruption, and interference attributable to and within the control of a Subcontractor or Supplier shall be deemed to be within the control of Contractor.

C. If Contractor's performance or progress is delayed, disrupted, or interfered with by unanticipated causes not the fault of and beyond the control of Owner, Contractor, and those for which they are responsible, then Contractor shall be entitled to an equitable adjustment in Contract Times. Such an adjustment will be Contractor's sole and exclusive remedy for the delays, disruption, and interference described in this paragraph. Causes of delay, disruption, or interference that may give rise to an adjustment in Contract Times under this paragraph include but are not limited to the following:

1. Severe and unavoidable natural catastrophes such as fires, floods, epidemics, and earthquakes;

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2. Abnormal weather conditions;

3. Acts or failures to act of third-party utility owners or other third-party entities (other than those third-party utility owners or other third-party entities performing other work at or adjacent to the Site as arranged by or under contract with Owner, as contemplated in Article 8); and

4. Acts of war or terrorism.

D. Contractor's entitlement to an adjustment of Contract Times or Contract Price is limited as follows:

1. Contractor's entitlement to an adjustment of the Contract Times is conditioned on the delay, disruption, or interference adversely affecting an activity on the critical path to completion of the Work, as of the time of the delay, disruption, or interference.

2. Contractor shall not be entitled to an adjustment in Contract Price for any delay, disruption, or interference if such delay is concurrent with a delay, disruption, or interference caused by or within the control of Contractor. Such a concurrent delay by Contractor shall not preclude an adjustment of Contract Times to which Contractor is otherwise entitled.

3. Adjustments of Contract Times or Contract Price are subject to the provisions of Article 11.

E. Each Contractor request or Change Proposal seeking an increase in Contract Times or Contract Price must be supplemented by supporting data that sets forth in detail the following:

1. The circumstances that form the basis for the requested adjustment;

2. The date upon which each cause of delay, disruption, or interference began to affect the progress of the Work;

3. The date upon which each cause of delay, disruption, or interference ceased to affect the progress of the Work;

4. The number of days' increase in Contract Times claimed as a consequence of each such cause of delay, disruption, or interference; and

5. The impact on Contract Price, in accordance with the provisions of Paragraph 11.07.

Contractor shall also furnish such additional supporting documentation as Owner or Engineer may require including, where appropriate, a revised progress schedule indicating all the activities affected by the delay, disruption, or interference, and an explanation of the effect of the delay, disruption, or interference on the critical path to completion of the Work.

F. Delays, disruption, and interference to the performance or progress of the Work resulting from the existence of a differing subsurface or physical condition, an Underground Facility that was not shown or indicated by the Contract Documents, or not shown or indicated with reasonable accuracy, and those resulting from Hazardous Environmental Conditions, are governed by Article 5, together with the provisions of Paragraphs 4.05.D and 4.05.E.

G. Paragraph 8.03 addresses delays, disruption, and interference to the performance or progress of the Work resulting from the performance of certain other work at or adjacent to the Site.

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

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5.01 *Availability of Lands*

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

B. Upon reasonable written request, Owner shall furnish Contractor with a current statement of record legal title and legal description of the lands upon which permanent improvements are to be made and Owner's interest therein as necessary for giving notice of or filing a mechanic's or construction lien against such lands in accordance with applicable Laws and Regulations.

C. Contractor shall provide for all additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment.

5.02 *Use of Site and Other Areas*

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

1. Contractor shall confine construction equipment, temporary construction facilities, the storage of materials and equipment, and the operations of workers to the Site, adjacent areas that Contractor has arranged to use through construction easements or otherwise, and other adjacent areas permitted by Laws and Regulations, and shall not unreasonably encumber the Site and such other adjacent areas with construction equipment or other materials or equipment. Contractor shall assume full responsibility for (a) damage to the Site; (b) damage to any such other adjacent areas used for Contractor's operations; (c) damage to any other adjacent land or areas, or to improvements, structures, utilities, or similar facilities located at such adjacent lands or areas; and (d) for injuries and losses sustained by the owners or occupants of any such land or areas; provided that such damage or injuries result from the performance of the Work or from other actions or conduct of the Contractor or those for which Contractor is responsible.

2. If a damage or injury claim is made by the owner or occupant of any such land or area because of the performance of the Work, or because of other actions or conduct of the Contractor or those for which Contractor is responsible, Contractor shall (a) take immediate corrective or remedial action as required by Paragraph 7.13, or otherwise; (b) promptly attempt to settle the claim as to all parties through negotiations with such owner or occupant, or otherwise resolve the claim by arbitration or other dispute resolution proceeding, or in a court of competent jurisdiction; and (c) to the fullest extent permitted by Laws and Regulations, indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them, from and against any such claim, and against all costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any claim or action, legal or equitable, brought by any such owner or occupant against Owner, Engineer, or any other party indemnified hereunder to the extent caused directly or indirectly, in whole or in part by, or based upon, Contractor's performance of the Work, or because of other actions or conduct of the Contractor or those for which Contractor is responsible.

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

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

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

5.03 *Subsurface and Physical Conditions*

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

1. Those reports of explorations and tests of subsurface conditions at or adjacent to the Site that contain Technical Data;

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

3. Technical Data contained in such reports and drawings.

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

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

D. *Limitations of Other Data and Documents:* Except for such reliance on Technical Data, Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, with respect to:

1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor, and safety precautions and programs incident thereto;

2. other data, interpretations, opinions, and information contained in such reports or shown or indicated in such drawings;

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3. the contents of other Site-related documents made available to Contractor, such as record drawings from other projects at or adjacent to the Site, or Owner's archival documents concerning the Site; or

4. any Contractor interpretation of or conclusion drawn from any Technical Data or any such other data, interpretations, opinions, or information.

5.04 *Differing Subsurface or Physical Conditions*

A. *Notice by Contractor*: If Contractor believes that any subsurface or physical condition that is uncovered or revealed at the Site:

1. is of such a nature as to establish that any Technical Data on which Contractor is entitled to rely as provided in Paragraph 5.03 is materially inaccurate;

2. is of such a nature as to require a change in the Drawings or Specifications;

3. differs materially from that shown or indicated in the Contract Documents; or

4. is of an unusual nature, and differs materially from conditions ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract Documents;

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

B. *Engineer's Review*: After receipt of written notice as required by the preceding paragraph, Engineer will promptly review the subsurface or physical condition in question; determine whether it is necessary for Owner to obtain additional exploration or tests with respect to the condition; conclude whether the condition falls within any one or more of the differing site condition categories in Paragraph 5.04.A; obtain any pertinent cost or schedule information from Contractor; prepare recommendations to Owner regarding the Contractor's resumption of Work in connection with the subsurface or physical condition in question and the need for any change in the Drawings or Specifications; and advise Owner in writing of Engineer's findings, conclusions, and recommendations.

C. *Owner's Statement to Contractor Regarding Site Condition*: After receipt of Engineer's written findings, conclusions, and recommendations, Owner shall issue a written statement to Contractor (with a copy to Engineer) regarding the subsurface or physical condition in question, addressing the resumption of Work in connection with such condition, indicating whether any change in the Drawings or Specifications will be made, and adopting or rejecting Engineer's written findings, conclusions, and recommendations, in whole or in part.

D. *Early Resumption of Work*: If at any time Engineer determines that Work in connection with the subsurface or physical condition in question may resume prior to completion of Engineer's review or Owner's issuance of its statement to Contractor, because the condition in question has been adequately documented, and analyzed on a preliminary basis, then the Engineer may at its discretion instruct Contractor to resume such Work.

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E. *Possible Price and Times Adjustments*

1. Contractor shall be entitled to an equitable adjustment in Contract Price or Contract Times, to the extent that the existence of a differing subsurface or physical condition, or any related delay, disruption, or interference, causes an increase or decrease in Contractor's cost of, or time required for, performance of the Work; subject, however, to the following:
   a. Such condition must fall within any one or more of the categories described in Paragraph 5.04.A;
   b. With respect to Work that is paid for on a unit price basis, any adjustment in Contract Price will be subject to the provisions of Paragraph 13.03; and,
   c. Contractor's entitlement to an adjustment of the Contract Times is subject to the provisions of Paragraphs 4.05.D and 4.05.E.

2. Contractor shall not be entitled to any adjustment in the Contract Price or Contract Times with respect to a subsurface or physical condition if:
   a. Contractor knew of the existence of such condition at the time Contractor made a commitment to Owner with respect to Contract Price and Contract Times by the submission of a Bid or becoming bound under a negotiated contract, or otherwise;
   b. The existence of such condition reasonably could have been discovered or revealed as a result of any examination, investigation, exploration, test, or study of the Site and contiguous areas expressly required by the Bidding Requirements or Contract Documents to be conducted by or for Contractor prior to Contractor's making such commitment; or
   c. Contractor failed to give the written notice required by Paragraph 5.04.A.

3. If Owner and Contractor agree regarding Contractor's entitlement to and the amount or extent of any adjustment in the Contract Price or Contract Times, then any such adjustment will be set forth in a Change Order.

4. Contractor may submit a Change Proposal regarding its entitlement to or the amount or extent of any adjustment in the Contract Price or Contract Times, no later than 30 days after Owner's issuance of the Owner's written statement to Contractor regarding the subsurface or physical condition in question.

F. *Underground Facilities; Hazardous Environmental Conditions*: Paragraph 5.05 governs rights and responsibilities regarding the presence or location of Underground Facilities. Paragraph 5.06 governs rights and responsibilities regarding Hazardous Environmental Conditions. The provisions of Paragraphs 5.03 and 5.04 are not applicable to the presence or location of Underground Facilities, or to Hazardous Environmental Conditions.

5.05 *Underground Facilities*

A. *Contractor's Responsibilities*: Unless it is otherwise expressly provided in the Supplementary Conditions, the cost of all of the following are included in the Contract Price, and Contractor shall have full responsibility for:

1. reviewing and checking all information and data regarding existing Underground Facilities at the Site;

2. complying with applicable state and local utility damage prevention Laws and Regulations;

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3. verifying the actual location of those Underground Facilities shown or indicated in the Contract Documents as being within the area affected by the Work, by exposing such Underground Facilities during the course of construction;

4. coordination of the Work with the owners (including Owner) of such Underground Facilities, during construction; and

5. the safety and protection of all existing Underground Facilities at the Site, and repairing any damage thereto resulting from the Work.

B. *Notice by Contractor*: If Contractor believes that an Underground Facility that is uncovered or revealed at the Site was not shown or indicated on the Drawings, or was not shown or indicated on the Drawings with reasonable accuracy, then Contractor shall, promptly after becoming aware thereof and before further disturbing conditions affected thereby or performing any Work in connection therewith (except in an emergency as required by Paragraph 7.15), notify Owner and Engineer in writing regarding such Underground Facility.

C. *Engineer's Review:* Engineer will:

1. promptly review the Underground Facility and conclude whether such Underground Facility was not shown or indicated on the Drawings, or was not shown or indicated with reasonable accuracy;

2. identify and communicate with the owner of the Underground Facility; prepare recommendations to Owner (and if necessary issue any preliminary instructions to Contractor) regarding the Contractor's resumption of Work in connection with the Underground Facility in question;

3. obtain any pertinent cost or schedule information from Contractor; determine the extent, if any, to which a change is required in the Drawings or Specifications to reflect and document the consequences of the existence or location of the Underground Facility; and

4. advise Owner in writing of Engineer's findings, conclusions, and recommendations.

During such time, Contractor shall be responsible for the safety and protection of such Underground Facility.

D. *Owner's Statement to Contractor Regarding Underground Facility*: After receipt of Engineer's written findings, conclusions, and recommendations, Owner shall issue a written statement to Contractor (with a copy to Engineer) regarding the Underground Facility in question addressing the resumption of Work in connection with such Underground Facility, indicating whether any change in the Drawings or Specifications will be made, and adopting or rejecting Engineer's written findings, conclusions, and recommendations in whole or in part.

E. *Early Resumption of Work*: If at any time Engineer determines that Work in connection with the Underground Facility may resume prior to completion of Engineer's review or Owner's issuance of its statement to Contractor, because the Underground Facility in question and conditions affected by its presence have been adequately documented, and analyzed on a preliminary basis, then the Engineer may at its discretion instruct Contractor to resume such Work.

F. *Possible Price and Times Adjustments*

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1. Contractor shall be entitled to an equitable adjustment in the Contract Price or Contract Times, to the extent that any existing Underground Facility at the Site that was not shown or indicated on the Drawings, or was not shown or indicated with reasonable accuracy, or any related delay, disruption, or interference, causes an increase or decrease in Contractor's cost of, or time required for, performance of the Work; subject, however, to the following:
    a. With respect to Work that is paid for on a unit price basis, any adjustment in Contract Price will be subject to the provisions of Paragraph 13.03;
    b. Contractor's entitlement to an adjustment of the Contract Times is subject to the provisions of Paragraphs 4.05.D and 4.05.E; and
    c. Contractor gave the notice required in Paragraph 5.05.B.

2. If Owner and Contractor agree regarding Contractor's entitlement to and the amount or extent of any adjustment in the Contract Price or Contract Times, then any such adjustment will be set forth in a Change Order.

3. Contractor may submit a Change Proposal regarding its entitlement to or the amount or extent of any adjustment in the Contract Price or Contract Times, no later than 30 days after Owner's issuance of the Owner's written statement to Contractor regarding the Underground Facility in question.

4. The information and data shown or indicated on the Drawings with respect to existing Underground Facilities at the Site is based on information and data (a) furnished by the owners of such Underground Facilities, or by others, (b) obtained from available records, or (c) gathered in an investigation conducted in accordance with the current edition of ASCE 38, Standard Guideline for the Collection and Depiction of Existing Subsurface Utility Data, by the American Society of Civil Engineers. If such information or data is incorrect or incomplete, Contractor's remedies are limited to those set forth in this Paragraph 5.05.F.

5.06 *Hazardous Environmental Conditions at Site*

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

1. those reports known to Owner relating to Hazardous Environmental Conditions that have been identified at or adjacent to the Site;

2. drawings known to Owner relating to Hazardous Environmental Conditions that have been identified at or adjacent to the Site; and

3. Technical Data contained in such reports and drawings.

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

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1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences and procedures of construction to be employed by Contractor, and safety precautions and programs incident thereto;

2. other data, interpretations, opinions, and information contained in such reports or shown or indicated in such drawings; or

3. any Contractor interpretation of or conclusion drawn from any Technical Data or any such other data, interpretations, opinions or information.

C. Contractor shall not be responsible for removing or remediating any Hazardous Environmental Condition encountered, uncovered, or revealed at the Site unless such removal or remediation is expressly identified in the Contract Documents to be within the scope of the Work.

D. Contractor shall be responsible for controlling, containing, and duly removing all Constituents of Concern brought to the Site by Contractor, Subcontractors, Suppliers, or anyone else for whom Contractor is responsible, and for any associated costs; and for the costs of removing and remediating any Hazardous Environmental Condition created by the presence of any such Constituents of Concern.

E. If Contractor encounters, uncovers, or reveals a Hazardous Environmental Condition whose removal or remediation is not expressly identified in the Contract Documents as being within the scope of the Work, or if Contractor or anyone for whom Contractor is responsible creates a Hazardous Environmental Condition, then Contractor shall immediately: (1) secure or otherwise isolate such condition; (2) stop all Work in connection with such condition and in any area affected thereby (except in an emergency as required by Paragraph 7.15); and (3) notify Owner and Engineer (and promptly thereafter confirm such notice in writing). Owner shall promptly consult with Engineer concerning the necessity for Owner to retain a qualified expert to evaluate such condition or take corrective action, if any. Promptly after consulting with Engineer, Owner shall take such actions as are necessary to permit Owner to timely obtain required permits and provide Contractor the written notice required by Paragraph 5.06.F. If Contractor or anyone for whom Contractor is responsible created the Hazardous Environmental Condition in question, then Owner may remove and remediate the Hazardous Environmental Condition, and impose a set-off against payments to account for the associated costs.

F. Contractor shall not resume Work in connection with such Hazardous Environmental Condition or in any affected area until after Owner has obtained any required permits related thereto, and delivered written notice to Contractor either (1) specifying that such condition and any affected area is or has been rendered safe for the resumption of Work, or (2) specifying any special conditions under which such Work may be resumed safely.

G. If Owner and Contractor cannot agree as to entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times, as a result of such Work stoppage, such special conditions under which Work is agreed to be resumed by Contractor, or any costs or expenses incurred in response to the Hazardous Environmental Condition, then within 30 days of Owner's written notice regarding the resumption of Work, Contractor may submit a Change Proposal, or Owner may impose a set-off. Entitlement to any such adjustment is subject to the provisions of Paragraphs 4.05.D, 4.05.E, 11.07, and 11.08.

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H. If, after receipt of such written notice, Contractor does not agree to resume such Work based on a reasonable belief it is unsafe, or does not agree to resume such Work under such special conditions, then Owner may order the portion of the Work that is in the area affected by such condition to be deleted from the Work, following the contractual change procedures in Article 11. Owner may have such deleted portion of the Work performed by Owner's own forces or others in accordance with Article 8.

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

J. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to the failure to control, contain, or remove a Constituent of Concern brought to the Site by Contractor or by anyone for whom Contractor is responsible, or to a Hazardous Environmental Condition created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 5.06.J obligates Contractor to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.

K. The provisions of Paragraphs 5.03, 5.04, and 5.05 do not apply to the presence of Constituents of Concern or to a Hazardous Environmental Condition uncovered or revealed at the Site.

ARTICLE 6—BONDS AND INSURANCE

6.01 *Performance, Payment, and Other Bonds*

A. Contractor shall furnish a performance bond and a payment bond, each in an amount at least equal to the Contract Price, as security for the faithful performance and payment of Contractor's obligations under the Contract. These bonds must remain in effect until one year after the date when final payment becomes due or until completion of the correction period specified in Paragraph 15.08, whichever is later, except as provided otherwise by Laws or Regulations, the terms of a prescribed bond form, the Supplementary Conditions, or other provisions of the Contract.

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B. Contractor shall also furnish such other bonds (if any) as are required by the Supplementary Conditions or other provisions of the Contract.

C. All bonds must be in the form included in the Bidding Documents or otherwise specified by Owner prior to execution of the Contract, except as provided otherwise by Laws or Regulations, and must be issued and signed by a surety named in "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Department Circular 570 (as amended and supplemented) by the Bureau of the Fiscal Service, U.S. Department of the Treasury. A bond signed by an agent or attorney-in-fact must be accompanied by a certified copy of that individual's authority to bind the surety. The evidence of authority must show that it is effective on the date the agent or attorney-in-fact signed the accompanying bond.

D. Contractor shall obtain the required bonds from surety companies that are duly licensed or authorized, in the state or jurisdiction in which the Project is located, to issue bonds in the required amounts.

E. If the surety on a bond furnished by Contractor is declared bankrupt or becomes insolvent, or the surety ceases to meet the requirements above, then Contractor shall promptly notify Owner and Engineer in writing and shall, within 20 days after the event giving rise to such notification, provide another bond and surety, both of which must comply with the bond and surety requirements above.

F. If Contractor has failed to obtain a required bond, Owner may exclude the Contractor from the Site and exercise Owner's termination rights under Article 16.

G. Upon request to Owner from any Subcontractor, Supplier, or other person or entity claiming to have furnished labor, services, materials, or equipment used in the performance of the Work, Owner shall provide a copy of the payment bond to such person or entity.

H. Upon request to Contractor from any Subcontractor, Supplier, or other person or entity claiming to have furnished labor, services, materials, or equipment used in the performance of the Work, Contractor shall provide a copy of the payment bond to such person or entity.

6.02 *Insurance—General Provisions*

A. Owner and Contractor shall obtain and maintain insurance as required in this article and in the Supplementary Conditions.

B. All insurance required by the Contract to be purchased and maintained by Owner or Contractor shall be obtained from insurance companies that are duly licensed or authorized in the state or jurisdiction in which the Project is located to issue insurance policies for the required limits and coverages. Unless a different standard is indicated in the Supplementary Conditions, all companies that provide insurance policies required under this Contract shall have an A.M. Best rating of A-VII or better.

C. Alternative forms of insurance coverage, including but not limited to self-insurance and "Occupational Accident and Excess Employer's Indemnity Policies," are not sufficient to meet the insurance requirements of this Contract, unless expressly allowed in the Supplementary Conditions.

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D. Contractor shall deliver to Owner, with copies to each additional insured identified in the Contract, certificates of insurance and endorsements establishing that Contractor has obtained and is maintaining the policies and coverages required by the Contract. Upon request by Owner or any other insured, Contractor shall also furnish other evidence of such required insurance, including but not limited to copies of policies, documentation of applicable self-insured retentions (if allowed) and deductibles, full disclosure of all relevant exclusions, and evidence of insurance required to be purchased and maintained by Subcontractors or Suppliers. In any documentation furnished under this provision, Contractor, Subcontractors, and Suppliers may block out (redact) (1) any confidential premium or pricing information and (2) any wording specific to a project or jurisdiction other than those applicable to this Contract.

E. Owner shall deliver to Contractor, with copies to each additional insured identified in the Contract, certificates of insurance and endorsements establishing that Owner has obtained and is maintaining the policies and coverages required of Owner by the Contract (if any). Upon request by Contractor or any other insured, Owner shall also provide other evidence of such required insurance (if any), including but not limited to copies of policies, documentation of applicable self-insured retentions (if allowed) and deductibles, and full disclosure of all relevant exclusions. In any documentation furnished under this provision, Owner may block out (redact) (1) any confidential premium or pricing information and (2) any wording specific to a project or jurisdiction other than those relevant to this Contract.

F. Failure of Owner or Contractor to demand such certificates or other evidence of the other party's full compliance with these insurance requirements, or failure of Owner or Contractor to identify a deficiency in compliance from the evidence provided, will not be construed as a waiver of the other party's obligation to obtain and maintain such insurance.

G. In addition to the liability insurance required to be provided by Contractor, the Owner, at Owner's option, may purchase and maintain Owner's own liability insurance. Owner's liability policies, if any, operate separately and independently from policies required to be provided by Contractor, and Contractor cannot rely upon Owner's liability policies for any of Contractor's obligations to the Owner, Engineer, or third parties.

H. Contractor shall require:

1. Subcontractors to purchase and maintain worker's compensation, commercial general liability, and other insurance that is appropriate for their participation in the Project, and to name as additional insureds Owner and Engineer (and any other individuals or entities identified in the Supplementary Conditions as additional insureds on Contractor's liability policies) on each Subcontractor's commercial general liability insurance policy; and

2. Suppliers to purchase and maintain insurance that is appropriate for their participation in the Project.

I. If either party does not purchase or maintain the insurance required of such party by the Contract, such party shall notify the other party in writing of such failure to purchase prior to the start of the Work, or of such failure to maintain prior to any change in the required coverage.

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J. If Contractor has failed to obtain and maintain required insurance, Contractor's entitlement to enter or remain at the Site will end immediately, and Owner may impose an appropriate set-off against payment for any associated costs (including but not limited to the cost of purchasing necessary insurance coverage), and exercise Owner's termination rights under Article 16.

K. Without prejudice to any other right or remedy, if a party has failed to obtain required insurance, the other party may elect (but is in no way obligated) to obtain equivalent insurance to protect such other party's interests at the expense of the party who was required to provide such coverage, and the Contract Price will be adjusted accordingly.

L. Owner does not represent that insurance coverage and limits established in this Contract necessarily will be adequate to protect Contractor or Contractor's interests. Contractor is responsible for determining whether such coverage and limits are adequate to protect its interests, and for obtaining and maintaining any additional insurance that Contractor deems necessary.

M. The insurance and insurance limits required herein will not be deemed as a limitation on Contractor's liability, or that of its Subcontractors or Suppliers, under the indemnities granted to Owner and other individuals and entities in the Contract or otherwise.

N. All the policies of insurance required to be purchased and maintained under this Contract will contain a provision or endorsement that the coverage afforded will not be canceled, or renewal refused, until at least 10 days prior written notice has been given to the purchasing policyholder. Within three days of receipt of any such written notice, the purchasing policyholder shall provide a copy of the notice to each other insured and Engineer.

6.03 *Contractor's Insurance*

A. *Required Insurance*: Contractor shall purchase and maintain Worker's Compensation, Commercial General Liability, and other insurance pursuant to the specific requirements of the Supplementary Conditions.

B. *General Provisions:* The policies of insurance required by this Paragraph 6.03 as supplemented must:

1. include at least the specific coverages required;

2. be written for not less than the limits provided, or those required by Laws or Regulations, whichever is greater;

3. remain in effect at least until the Work is complete (as set forth in Paragraph 15.06.D), and longer if expressly required elsewhere in this Contract, and at all times thereafter when Contractor may be correcting, removing, or replacing defective Work as a warranty or correction obligation, or otherwise, or returning to the Site to conduct other tasks arising from the Contract;

4. apply with respect to the performance of the Work, whether such performance is by Contractor, any Subcontractor or Supplier, or by anyone directly or indirectly employed by any of them to perform any of the Work, or by anyone for whose acts any of them may be liable; and

5. include all necessary endorsements to support the stated requirements.

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C. *Additional Insureds:* The Contractor's commercial general liability, automobile liability, employer's liability, umbrella or excess, pollution liability, and unmanned aerial vehicle liability policies, if required by this Contract, must:

1. include and list as additional insureds Owner and Engineer, and any individuals or entities identified as additional insureds in the Supplementary Conditions;

2. include coverage for the respective officers, directors, members, partners, employees, and consultants of all such additional insureds;

3. afford primary coverage to these additional insureds for all claims covered thereby (including as applicable those arising from both ongoing and completed operations);

4. not seek contribution from insurance maintained by the additional insured; and

5. as to commercial general liability insurance, apply to additional insureds with respect to liability caused in whole or in part by Contractor's acts or omissions, or the acts and omissions of those working on Contractor's behalf, in the performance of Contractor's operations.

6.04 *Builder's Risk and Other Property Insurance*

A. *Builder's Risk*: Unless otherwise provided in the Supplementary Conditions, Contractor shall purchase and maintain builder's risk insurance upon the Work on a completed value basis, in the amount of the Work's full insurable replacement cost (subject to such deductible amounts as may be provided in the Supplementary Conditions or required by Laws and Regulations). The specific requirements applicable to the builder's risk insurance are set forth in the Supplementary Conditions.

B. *Property Insurance for Facilities of Owner Where Work Will Occur:* Owner is responsible for obtaining and maintaining property insurance covering each existing structure, building, or facility in which any part of the Work will occur, or to which any part of the Work will attach or be adjoined. Such property insurance will be written on a special perils (all-risk) form, on a replacement cost basis, providing coverage consistent with that required for the builder's risk insurance, and will be maintained until the Work is complete, as set forth in Paragraph 15.06.D.

C. *Property Insurance for Substantially Complete Facilities:* Promptly after Substantial Completion, and before actual occupancy or use of the substantially completed Work, Owner will obtain property insurance for such substantially completed Work, and maintain such property insurance at least until the Work is complete, as set forth in Paragraph 15.06.D. Such property insurance will be written on a special perils (all-risk) form, on a replacement cost basis, and provide coverage consistent with that required for the builder's risk insurance. The builder's risk insurance may terminate upon written confirmation of Owner's procurement of such property insurance.

D. *Partial Occupancy or Use by Owner:* If Owner will occupy or use a portion or portions of the Work prior to Substantial Completion of all the Work, as provided in Paragraph 15.04, then Owner (directly, if it is the purchaser of the builder's risk policy, or through Contractor) will provide advance notice of such occupancy or use to the builder's risk insurer, and obtain an endorsement consenting to the continuation of coverage prior to commencing such partial occupancy or use.

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E. *Insurance of Other Property; Additional Insurance:* If the express insurance provisions of the Contract do not require or address the insurance of a property item or interest, then the entity or individual owning such property item will be responsible for insuring it. If Contractor elects to obtain other special insurance to be included in or supplement the builder's risk or property insurance policies provided under this Paragraph 6.04, it may do so at Contractor's expense.

6.05 *Property Losses; Subrogation*

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

1. Owner and Contractor waive all rights against each other and the respective officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, for all losses and damages caused by, arising out of, or resulting from any of the perils, risks, or causes of loss covered by such policies and any other property insurance applicable to the Work; and, in addition, waive all such rights against Engineer, its consultants, all individuals or entities identified in the Supplementary Conditions as builder's risk or installation floater insureds, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, under such policies for losses and damages so caused.

2. None of the above waivers extends to the rights that any party making such waiver may have to the proceeds of insurance held by Owner or Contractor as trustee or fiduciary, or otherwise payable under any policy so issued.

B. Any property insurance policy maintained by Owner covering any loss, damage, or consequential loss to Owner's existing structures, buildings, or facilities in which any part of the Work will occur, or to which any part of the Work will attach or adjoin; to adjacent structures, buildings, or facilities of Owner; or to part or all of the completed or substantially completed Work, during partial occupancy or use pursuant to Paragraph 15.04, after Substantial Completion pursuant to Paragraph 15.03, or after final payment pursuant to Paragraph 15.06, will contain provisions to the effect that in the event of payment of any loss or damage the insurer will have no rights of recovery against any insureds thereunder, or against Contractor, Subcontractors, or Engineer, or the officers, directors, members, partners, employees, agents, consultants, or subcontractors of each and any of them, and that the insured is allowed to waive the insurer's rights of subrogation in a written contract executed prior to the loss, damage, or consequential loss.

1. Owner waives all rights against Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them, for all losses and damages caused by, arising out of, or resulting from fire or any of the perils, risks, or causes of loss covered by such policies.

C. The waivers in this Paragraph 6.05 include the waiver of rights due to business interruption, loss of use, or other consequential loss extending beyond direct physical loss or damage to Owner's property or the Work caused by, arising out of, or resulting from fire or other insured peril, risk, or cause of loss.

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D. Contractor shall be responsible for assuring that each Subcontract contains provisions whereby the Subcontractor waives all rights against Owner, Contractor, all individuals or entities identified in the Supplementary Conditions as insureds, the Engineer and its consultants, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, for all losses and damages caused by, arising out of, relating to, or resulting from fire or other peril, risk, or cause of loss covered by builder's risk insurance, installation floater, and any other property insurance applicable to the Work.

6.06 *Receipt and Application of Property Insurance Proceeds*

A. Any insured loss under the builder's risk and other policies of property insurance required by Paragraph 6.04 will be adjusted and settled with the named insured that purchased the policy. Such named insured shall act as fiduciary for the other insureds, and give notice to such other insureds that adjustment and settlement of a claim is in progress. Any other insured may state its position regarding a claim for insured loss in writing within 15 days after notice of such claim.

B. Proceeds for such insured losses may be made payable by the insurer either jointly to multiple insureds, or to the named insured that purchased the policy in its own right and as fiduciary for other insureds, subject to the requirements of any applicable mortgage clause. A named insured receiving insurance proceeds under the builder's risk and other policies of insurance required by Paragraph 6.04 shall maintain such proceeds in a segregated account, and distribute such proceeds in accordance with such agreement as the parties in interest may reach, or as otherwise required under the dispute resolution provisions of this Contract or applicable Laws and Regulations.

C. If no other special agreement is reached, Contractor shall repair or replace the damaged Work, using allocated insurance proceeds.

ARTICLE 7—CONTRACTOR'S RESPONSIBILITIES

7.01 *Contractor's Means and Methods of Construction*

A. Contractor shall be solely responsible for the means, methods, techniques, sequences, and procedures of construction.

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

7.02 *Supervision and Superintendence*

A. Contractor shall supervise, inspect, and direct the Work competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform the Work in accordance with the Contract Documents.

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B. At all times during the progress of the Work, Contractor shall assign a competent resident superintendent who will not be replaced without written notice to Owner and Engineer except under extraordinary circumstances.

7.03 *Labor; Working Hours*

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

B. Contractor shall be fully responsible to Owner and Engineer for all acts and omissions of Contractor's employees; of Suppliers and Subcontractors, and their employees; and of any other individuals or entities performing or furnishing any of the Work, just as Contractor is responsible for Contractor's own acts and omissions.

C. Except as otherwise required for the safety or protection of persons or the Work or property at the Site or adjacent thereto, and except as otherwise stated in the Contract Documents, all Work at the Site will be performed during regular working hours, Monday through Friday. Contractor will not perform Work on a Saturday, Sunday, or any legal holiday. Contractor may perform Work outside regular working hours or on Saturdays, Sundays, or legal holidays only with Owner's written consent, which will not be unreasonably withheld.

7.04 *Services, Materials, and Equipment*

A. Unless otherwise specified in the Contract Documents, Contractor shall provide and assume full responsibility for all services, materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities, and all other facilities and incidentals necessary for the performance, testing, start up, and completion of the Work, whether or not such items are specifically called for in the Contract Documents.

B. All materials and equipment incorporated into the Work must be new and of good quality, except as otherwise provided in the Contract Documents. All special warranties and guarantees required by the Specifications will expressly run to the benefit of Owner. If required by Engineer, Contractor shall furnish satisfactory evidence (including reports of required tests) as to the source, kind, and quality of materials and equipment.

C. All materials and equipment must be stored, applied, installed, connected, erected, protected, used, cleaned, and conditioned in accordance with instructions of the applicable Supplier, except as otherwise may be provided in the Contract Documents.

7.05 *"Or Equals"*

A. *Contractor's Request; Governing Criteria:* Whenever an item of equipment or material is specified or described in the Contract Documents by using the names of one or more proprietary items or specific Suppliers, the Contract Price has been based upon Contractor furnishing such item as specified. The specification or description of such an item is intended to establish the type, function, appearance, and quality required. Unless the specification or description contains or is followed by words reading that no like, equivalent, or "or equal" item is permitted, Contractor may request that Engineer authorize the use of other items of equipment or material, or items from other proposed Suppliers, under the circumstances described below.

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1. If Engineer in its sole discretion determines that an item of equipment or material proposed by Contractor is functionally equal to that named and sufficiently similar so that no change in related Work will be required, Engineer will deem it an "or equal" item. For the purposes of this paragraph, a proposed item of equipment or material will be considered functionally equal to an item so named if:
    a. in the exercise of reasonable judgment Engineer determines that the proposed item:
        1) is at least equal in materials of construction, quality, durability, appearance, strength, and design characteristics;
        2) will reliably perform at least equally well the function and achieve the results imposed by the design concept of the completed Project as a functioning whole;
        3) has a proven record of performance and availability of responsive service; and
        4) is not objectionable to Owner.
    b. Contractor certifies that, if the proposed item is approved and incorporated into the Work:
        1) there will be no increase in cost to the Owner or increase in Contract Times; and
        2) the item will conform substantially to the detailed requirements of the item named in the Contract Documents.

B. *Contractor's Expense:* Contractor shall provide all data in support of any proposed "or equal" item at Contractor's expense.

C. *Engineer's Evaluation and Determination:* Engineer will be allowed a reasonable time to evaluate each "or-equal" request. Engineer may require Contractor to furnish additional data about the proposed "or-equal" item. Engineer will be the sole judge of acceptability. No "or-equal" item will be ordered, furnished, installed, or utilized until Engineer's review is complete and Engineer determines that the proposed item is an "or-equal," which will be evidenced by an approved Shop Drawing or other written communication. Engineer will advise Contractor in writing of any negative determination.

D. *Effect of Engineer's Determination:* Neither approval nor denial of an "or-equal" request will result in any change in Contract Price. The Engineer's denial of an "or-equal" request will be final and binding, and may not be reversed through an appeal under any provision of the Contract.

E. *Treatment as a Substitution Request:* If Engineer determines that an item of equipment or material proposed by Contractor does not qualify as an "or-equal" item, Contractor may request that Engineer consider the item a proposed substitute pursuant to Paragraph 7.06.

7.06 *Substitutes*

A. *Contractor's Request; Governing Criteria:* Unless the specification or description of an item of equipment or material required to be furnished under the Contract Documents contains or is followed by words reading that no substitution is permitted, Contractor may request that Engineer authorize the use of other items of equipment or material under the circumstances described below. To the extent possible such requests must be made before commencement of related construction at the Site.

    1. Contractor shall submit sufficient information as provided below to allow Engineer to determine if the item of material or equipment proposed is functionally equivalent to that named and an acceptable substitute therefor. Engineer will not accept requests for review of proposed substitute items of equipment or material from anyone other than Contractor.

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2. The requirements for review by Engineer will be as set forth in Paragraph 7.06.B, as supplemented by the Specifications, and as Engineer may decide is appropriate under the circumstances.

3. Contractor shall make written application to Engineer for review of a proposed substitute item of equipment or material that Contractor seeks to furnish or use. The application:
   a. will certify that the proposed substitute item will:
      1) perform adequately the functions and achieve the results called for by the general design;
      2) be similar in substance to the item specified; and
      3) be suited to the same use as the item specified.
   b. will state:
      1) the extent, if any, to which the use of the proposed substitute item will necessitate a change in Contract Times;
      2) whether use of the proposed substitute item in the Work will require a change in any of the Contract Documents (or in the provisions of any other direct contract with Owner for other work on the Project) to adapt the design to the proposed substitute item; and
      3) whether incorporation or use of the proposed substitute item in connection with the Work is subject to payment of any license fee or royalty.
   c. will identify:
      1) all variations of the proposed substitute item from the item specified; and
      2) available engineering, sales, maintenance, repair, and replacement services.
   d. will contain an itemized estimate of all costs or credits that will result directly or indirectly from use of such substitute item, including but not limited to changes in Contract Price, shared savings, costs of redesign, and claims of other contractors affected by any resulting change.

B. *Engineer's Evaluation and Determination*: Engineer will be allowed a reasonable time to evaluate each substitute request, and to obtain comments and direction from Owner. Engineer may require Contractor to furnish additional data about the proposed substitute item. Engineer will be the sole judge of acceptability. No substitute will be ordered, furnished, installed, or utilized until Engineer's review is complete and Engineer determines that the proposed item is an acceptable substitute. Engineer's determination will be evidenced by a Field Order or a proposed Change Order accounting for the substitution itself and all related impacts, including changes in Contract Price or Contract Times. Engineer will advise Contractor in writing of any negative determination.

C. *Special Guarantee:* Owner may require Contractor to furnish at Contractor's expense a special performance guarantee or other surety with respect to any substitute.

D. *Reimbursement of Engineer's Cost:* Engineer will record Engineer's costs in evaluating a substitute proposed or submitted by Contractor. Whether or not Engineer approves a substitute so proposed or submitted by Contractor, Contractor shall reimburse Owner for the reasonable charges of Engineer for evaluating each such proposed substitute. Contractor shall also reimburse Owner for the reasonable charges of Engineer for making changes in the Contract Documents (or in the provisions of any other direct contract with Owner) resulting from the acceptance of each proposed substitute.

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E. *Contractor's Expense:* Contractor shall provide all data in support of any proposed substitute at Contractor's expense.

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

7.07 *Concerning Subcontractors and Suppliers*

A. Contractor may retain Subcontractors and Suppliers for the performance of parts of the Work. Such Subcontractors and Suppliers must be acceptable to Owner. The Contractor's retention of a Subcontractor or Supplier for the performance of parts of the Work will not relieve Contractor's obligation to Owner to perform and complete the Work in accordance with the Contract Documents.

B. Contractor shall retain specific Subcontractors and Suppliers for the performance of designated parts of the Work if required by the Contract to do so.

C. Subsequent to the submittal of Contractor's Bid or final negotiation of the terms of the Contract, Owner may not require Contractor to retain any Subcontractor or Supplier to furnish or perform any of the Work against which Contractor has reasonable objection.

D. Prior to entry into any binding subcontract or purchase order, Contractor shall submit to Owner the identity of the proposed Subcontractor or Supplier (unless Owner has already deemed such proposed Subcontractor or Supplier acceptable during the bidding process or otherwise). Such proposed Subcontractor or Supplier shall be deemed acceptable to Owner unless Owner raises a substantive, reasonable objection within 5 days.

E. Owner may require the replacement of any Subcontractor or Supplier. Owner also may require Contractor to retain specific replacements; provided, however, that Owner may not require a replacement to which Contractor has a reasonable objection. If Contractor has submitted the identity of certain Subcontractors or Suppliers for acceptance by Owner, and Owner has accepted it (either in writing or by failing to make written objection thereto), then Owner may subsequently revoke the acceptance of any such Subcontractor or Supplier so identified solely on the basis of substantive, reasonable objection after due investigation. Contractor shall submit an acceptable replacement for the rejected Subcontractor or Supplier.

F. If Owner requires the replacement of any Subcontractor or Supplier retained by Contractor to perform any part of the Work, then Contractor shall be entitled to an adjustment in Contract Price or Contract Times, with respect to the replacement; and Contractor shall initiate a Change Proposal for such adjustment within 30 days of Owner's requirement of replacement.

G. No acceptance by Owner of any such Subcontractor or Supplier, whether initially or as a replacement, will constitute a waiver of the right of Owner to the completion of the Work in accordance with the Contract Documents.

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H. On a monthly basis, Contractor shall submit to Engineer a complete list of all Subcontractors and Suppliers having a direct contract with Contractor, and of all other Subcontractors and Suppliers known to Contractor at the time of submittal.

I. Contractor shall be solely responsible for scheduling and coordinating the work of Subcontractors and Suppliers.

J. The divisions and sections of the Specifications and the identifications of any Drawings do not control Contractor in dividing the Work among Subcontractors or Suppliers, or in delineating the Work to be performed by any specific trade.

K. All Work performed for Contractor by a Subcontractor or Supplier must be pursuant to an appropriate contractual agreement that specifically binds the Subcontractor or Supplier to the applicable terms and conditions of the Contract for the benefit of Owner and Engineer.

L. Owner may furnish to any Subcontractor or Supplier, to the extent practicable, information about amounts paid to Contractor for Work performed for Contractor by the Subcontractor or Supplier.

M. Contractor shall restrict all Subcontractors and Suppliers from communicating with Engineer or Owner, except through Contractor or in case of an emergency, or as otherwise expressly allowed in this Contract.

7.08 *Patent Fees and Royalties*

A. Contractor shall pay all license fees and royalties and assume all costs incident to the use in the performance of the Work or the incorporation in the Work of any invention, design, process, product, or device which is the subject of patent rights or copyrights held by others. If an invention, design, process, product, or device is specified in the Contract Documents for use in the performance of the Work and if, to the actual knowledge of Owner or Engineer, its use is subject to patent rights or copyrights calling for the payment of any license fee or royalty to others, the existence of such rights will be disclosed in the Contract Documents.

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

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

7.09 *Permits*

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

7.10 *Taxes*

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

7.11 *Laws and Regulations*

A. Contractor shall give all notices required by and shall comply with all Laws and Regulations applicable to the performance of the Work. Neither Owner nor Engineer shall be responsible for monitoring Contractor's compliance with any Laws or Regulations.

B. If Contractor performs any Work or takes any other action knowing or having reason to know that it is contrary to Laws or Regulations, Contractor shall bear all resulting costs and losses, and shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such Work or other action. It is not Contractor's responsibility to make certain that the Work described in the Contract Documents is in accordance with Laws and Regulations, but this does not relieve Contractor of its obligations under Paragraph 3.03.

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C. Owner or Contractor may give written notice to the other party of any changes after the submission of Contractor's Bid (or after the date when Contractor became bound under a negotiated contract) in Laws or Regulations having an effect on the cost or time of performance of the Work, including but not limited to changes in Laws or Regulations having an effect on procuring permits and on sales, use, value-added, consumption, and other similar taxes. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times resulting from such changes, then within 30 days of such written notice Contractor may submit a Change Proposal, or Owner may initiate a Claim.

7.12 *Record Documents*

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

7.13 *Safety and Protection*

A. Contractor shall be solely responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the Work. Such responsibility does not relieve Subcontractors of their responsibility for the safety of persons or property in the performance of their work, nor for compliance with applicable safety Laws and Regulations.

B. Contractor shall designate a qualified and experienced safety representative whose duties and responsibilities are the prevention of Work-related accidents and the maintenance and supervision of safety precautions and programs.

C. Contractor shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury, or loss to:

1. all persons on the Site or who may be affected by the Work;

2. all the Work and materials and equipment to be incorporated therein, whether in storage on or off the Site; and

3. other property at the Site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, other work in progress, utilities, and Underground Facilities not designated for removal, relocation, or replacement in the course of construction.

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D. All damage, injury, or loss to any property referred to in Paragraph 7.13.C.2 or 7.13.C.3 caused, directly or indirectly, in whole or in part, by Contractor, any Subcontractor, Supplier, or any other individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, shall be remedied by Contractor at its expense (except damage or loss attributable to the fault of Drawings or Specifications or to the acts or omissions of Owner or Engineer or anyone employed by any of them, or anyone for whose acts any of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of Contractor or any Subcontractor, Supplier, or other individual or entity directly or indirectly employed by any of them).

E. Contractor shall comply with all applicable Laws and Regulations relating to the safety of persons or property, or to the protection of persons or property from damage, injury, or loss; and shall erect and maintain all necessary safeguards for such safety and protection.

F. Contractor shall notify Owner; the owners of adjacent property; the owners of Underground Facilities and other utilities (if the identity of such owners is known to Contractor); and other contractors and utility owners performing work at or adjacent to the Site, in writing, when Contractor knows that prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation, and replacement of their property or work in progress.

G. Contractor shall comply with the applicable requirements of Owner's safety programs, if any. Any Owner's safety programs that are applicable to the Work are identified or included in the Supplementary Conditions or Specifications.

H. Contractor shall inform Owner and Engineer of the specific requirements of Contractor's safety program with which Owner's and Engineer's employees and representatives must comply while at the Site.

I. Contractor's duties and responsibilities for safety and protection will continue until all the Work is completed, Engineer has issued a written notice to Owner and Contractor in accordance with Paragraph 15.06.C that the Work is acceptable, and Contractor has left the Site (except as otherwise expressly provided in connection with Substantial Completion).

J. Contractor's duties and responsibilities for safety and protection will resume whenever Contractor or any Subcontractor or Supplier returns to the Site to fulfill warranty or correction obligations, or to conduct other tasks arising from the Contract Documents.

7.14 *Hazard Communication Programs*

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

7.15 *Emergencies*

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

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change in the Contract Documents is required because of an emergency or Contractor's response, a Work Change Directive or Change Order will be issued.

7.16 *Submittals*

A. *Shop Drawing and Sample Requirements*

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

2. Each Shop Drawing or Sample must bear a stamp or specific written certification that Contractor has satisfied Contractor's obligations under the Contract Documents with respect to Contractor's review of that Submittal, and that Contractor approves the Submittal.

3. With each Shop Drawing or Sample, Contractor shall give Engineer specific written notice of any variations that the Submittal may have from the requirements of the Contract Documents. This notice must be set forth in a written communication separate from the Submittal; and, in addition, in the case of a Shop Drawing by a specific notation made on the Shop Drawing itself.

B. *Submittal Procedures for Shop Drawings and Samples:* Contractor shall label and submit Shop Drawings and Samples to Engineer for review and approval in accordance with the accepted Schedule of Submittals.

1. *Shop Drawings*
   a. Contractor shall submit the number of copies required in the Specifications.
   b. Data shown on the Shop Drawings must be complete with respect to quantities, dimensions, specified performance and design criteria, materials, and similar data to show Engineer the services, materials, and equipment Contractor proposes to provide, and to enable Engineer to review the information for the limited purposes required by Paragraph 7.16.C.

2. *Samples*
   a. Contractor shall submit the number of Samples required in the Specifications.

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b. Contractor shall clearly identify each Sample as to material, Supplier, pertinent data such as catalog numbers, the use for which intended and other data as Engineer may require to enable Engineer to review the Submittal for the limited purposes required by Paragraph 7.16.C.

3. Where a Shop Drawing or Sample is required by the Contract Documents or the Schedule of Submittals, any related Work performed prior to Engineer's review and approval of the pertinent submittal will be at the sole expense and responsibility of Contractor.

C. *Engineer's Review of Shop Drawings and Samples*

1. Engineer will provide timely review of Shop Drawings and Samples in accordance with the accepted Schedule of Submittals. Engineer's review and approval will be only to determine if the items covered by the Submittals will, after installation or incorporation in the Work, comply with the requirements of the Contract Documents, and be compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents.

2. Engineer's review and approval will not extend to means, methods, techniques, sequences, or procedures of construction, or to safety precautions or programs incident thereto.

3. Engineer's review and approval of a separate item as such will not indicate approval of the assembly in which the item functions.

4. Engineer's review and approval of a Shop Drawing or Sample will not relieve Contractor from responsibility for any variation from the requirements of the Contract Documents unless Contractor has complied with the requirements of Paragraph 7.16.A.3 and Engineer has given written approval of each such variation by specific written notation thereof incorporated in or accompanying the Shop Drawing or Sample. Engineer will document any such approved variation from the requirements of the Contract Documents in a Field Order or other appropriate Contract modification.

5. Engineer's review and approval of a Shop Drawing or Sample will not relieve Contractor from responsibility for complying with the requirements of Paragraphs 7.16.A and B.

6. Engineer's review and approval of a Shop Drawing or Sample, or of a variation from the requirements of the Contract Documents, will not, under any circumstances, change the Contract Times or Contract Price, unless such changes are included in a Change Order.

7. Neither Engineer's receipt, review, acceptance, or approval of a Shop Drawing or Sample will result in such item becoming a Contract Document.

8. Contractor shall perform the Work in compliance with the requirements and commitments set forth in approved Shop Drawings and Samples, subject to the provisions of Paragraph 7.16.C.4.

D. *Resubmittal Procedures for Shop Drawings and Samples*

1. Contractor shall make corrections required by Engineer and shall return the required number of corrected copies of Shop Drawings and submit, as required, new Samples for review and approval. Contractor shall direct specific attention in writing to revisions other than the corrections called for by Engineer on previous Submittals.

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2. Contractor shall furnish required Shop Drawing and Sample submittals with sufficient information and accuracy to obtain required approval of an item with no more than two resubmittals. Engineer will record Engineer's time for reviewing a third or subsequent resubmittal of a Shop Drawing or Sample, and Contractor shall be responsible for Engineer's charges to Owner for such time. Owner may impose a set-off against payments due Contractor to secure reimbursement for such charges.

3. If Contractor requests a change of a previously approved Shop Drawing or Sample, Contractor shall be responsible for Engineer's charges to Owner for its review time, and Owner may impose a set-off against payments due Contractor to secure reimbursement for such charges, unless the need for such change is beyond the control of Contractor.

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

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

2. Procedures for the submittal and acceptance of the Progress Schedule, the Schedule of Submittals, and the Schedule of Values are set forth in Paragraphs 2.03. 2.04, and 2.05.

F. Owner-delegated Designs: Submittals pursuant to Owner-delegated designs are governed by the provisions of Paragraph 7.19.

7.17 *Contractor's General Warranty and Guarantee*

A. Contractor warrants and guarantees to Owner that all Work will be in accordance with the Contract Documents and will not be defective. Engineer is entitled to rely on Contractor's warranty and guarantee.

B. Owner's rights under this warranty and guarantee are in addition to, and are not limited by, Owner's rights under the correction period provisions of Paragraph 15.08. The time in which Owner may enforce its warranty and guarantee rights under this Paragraph 7.17 is limited only by applicable Laws and Regulations restricting actions to enforce such rights; provided, however, that after the end of the correction period under Paragraph 15.08:

1. Owner shall give Contractor written notice of any defective Work within 60 days of the discovery that such Work is defective; and

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2. Such notice will be deemed the start of an event giving rise to a Claim under Paragraph 12.01.B, such that any related Claim must be brought within 30 days of the notice.

C. Contractor's warranty and guarantee hereunder excludes defects or damage caused by:

1. abuse, or improper modification, maintenance, or operation, by persons other than Contractor, Subcontractors, Suppliers, or any other individual or entity for whom Contractor is responsible; or

2. normal wear and tear under normal usage.

D. Contractor's obligation to perform and complete the Work in accordance with the Contract Documents is absolute. None of the following will constitute an acceptance of Work that is not in accordance with the Contract Documents, a release of Contractor's obligation to perform the Work in accordance with the Contract Documents, or a release of Owner's warranty and guarantee rights under this Paragraph 7.17:

1. Observations by Engineer;

2. Recommendation by Engineer or payment by Owner of any progress or final payment;

3. The issuance of a certificate of Substantial Completion by Engineer or any payment related thereto by Owner;

4. Use or occupancy of the Work or any part thereof by Owner;

5. Any review and approval of a Shop Drawing or Sample submittal;

6. The issuance of a notice of acceptability by Engineer;

7. The end of the correction period established in Paragraph 15.08;

8. Any inspection, test, or approval by others; or

9. Any correction of defective Work by Owner.

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

7.18 *Indemnification*

A. To the fullest extent permitted by Laws and Regulations, and in addition to any other obligations of Contractor under the Contract or otherwise, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them, from losses, damages, costs, and judgments (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals, and all court or arbitration or other dispute resolution costs) arising from third-party claims or actions relating to or resulting from the performance or furnishing of the Work, provided that any such claim, action, loss, cost, judgment or damage is attributable to bodily injury, sickness, disease, or death, or to damage to or destruction of tangible property (other than the Work itself), including the loss of use resulting therefrom, but only to the extent

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caused by any negligent act or omission of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable.

B. In any and all claims against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, by any employee (or the survivor or personal representative of such employee) of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, the indemnification obligation under Paragraph 7.18.A will not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for Contractor or any such Subcontractor, Supplier, or other individual or entity under workers' compensation acts, disability benefit acts, or other employee benefit acts.

7.19 *Delegation of Professional Design Services*

A. Owner may require Contractor to provide professional design services for a portion of the Work by express delegation in the Contract Documents. Such delegation will specify the performance and design criteria that such services must satisfy, and the Submittals that Contractor must furnish to Engineer with respect to the Owner-delegated design.

B. Contractor shall cause such Owner-delegated professional design services to be provided pursuant to the professional standard of care by a properly licensed design professional, whose signature and seal must appear on all drawings, calculations, specifications, certifications, and Submittals prepared by such design professional. Such design professional must issue all certifications of design required by Laws and Regulations.

C. If a Shop Drawing or other Submittal related to the Owner-delegated design is prepared by Contractor, a Subcontractor, or others for submittal to Engineer, then such Shop Drawing or other Submittal must bear the written approval of Contractor's design professional when submitted by Contractor to Engineer.

D. Owner and Engineer shall be entitled to rely upon the adequacy, accuracy, and completeness of the services, certifications, and approvals performed or provided by the design professionals retained or employed by Contractor under an Owner-delegated design, subject to the professional standard of care and the performance and design criteria stated in the Contract Documents.

E. Pursuant to this Paragraph 7.19, Engineer's review, approval, and other determinations regarding design drawings, calculations, specifications, certifications, and other Submittals furnished by Contractor pursuant to an Owner-delegated design will be only for the following limited purposes:

1. Checking for conformance with the requirements of this Paragraph 7.19;

2. Confirming that Contractor (through its design professionals) has used the performance and design criteria specified in the Contract Documents; and

3. Establishing that the design furnished by Contractor is consistent with the design concept expressed in the Contract Documents.

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F. Contractor shall not be responsible for the adequacy of performance or design criteria specified by Owner or Engineer.

G. Contractor is not required to provide professional services in violation of applicable Laws and Regulations.

ARTICLE 8—OTHER WORK AT THE SITE

8.01 *Other Work*

A. In addition to and apart from the Work under the Contract Documents, the Owner may perform other work at or adjacent to the Site. Such other work may be performed by Owner's employees, or through contracts between the Owner and third parties. Owner may also arrange to have third-party utility owners perform work on their utilities and facilities at or adjacent to the Site.

B. If Owner performs other work at or adjacent to the Site with Owner's employees, or through contracts for such other work, then Owner shall give Contractor written notice thereof prior to starting any such other work. If Owner has advance information regarding the start of any third-party utility work that Owner has arranged to take place at or adjacent to the Site, Owner shall provide such information to Contractor.

C. Contractor shall afford proper and safe access to the Site to each contractor that performs such other work, each utility owner performing other work, and Owner, if Owner is performing other work with Owner's employees, and provide a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such other work.

D. Contractor shall do all cutting, fitting, and patching of the Work that may be required to properly connect or otherwise make its several parts come together and properly integrate with such other work. Contractor shall not endanger any work of others by cutting, excavating, or otherwise altering such work; provided, however, that Contractor may cut or alter others' work with the written consent of Engineer and the others whose work will be affected.

E. If the proper execution or results of any part of Contractor's Work depends upon work performed by others, Contractor shall inspect such other work and promptly report to Engineer in writing any delays, defects, or deficiencies in such other work that render it unavailable or unsuitable for the proper execution and results of Contractor's Work. Contractor's failure to so report will constitute an acceptance of such other work as fit and proper for integration with Contractor's Work except for latent defects and deficiencies in such other work.

F. The provisions of this article are not applicable to work that is performed by third-party utilities or other third-party entities without a contract with Owner, or that is performed without having been arranged by Owner. If such work occurs, then any related delay, disruption, or interference incurred by Contractor is governed by the provisions of Paragraph 4.05.C.3.

8.02 *Coordination*

A. If Owner intends to contract with others for the performance of other work at or adjacent to the Site, to perform other work at or adjacent to the Site with Owner's employees, or to arrange to have utility owners perform work at or adjacent to the Site, the following will be set forth in the Supplementary Conditions or provided to Contractor prior to the start of any such other work:

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1. The identity of the individual or entity that will have authority and responsibility for coordination of the activities among the various contractors;

2. An itemization of the specific matters to be covered by such authority and responsibility; and

3. The extent of such authority and responsibilities.

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

8.03 *Legal Relationships*

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

B. Contractor shall take reasonable and customary measures to avoid damaging, delaying, disrupting, or interfering with the work of Owner, any other contractor, or any utility owner performing other work at or adjacent to the Site.

1. If Contractor fails to take such measures and as a result damages, delays, disrupts, or interferes with the work of any such other contractor or utility owner, then Owner may impose a set-off against payments due Contractor, and assign to such other contractor or utility owner the Owner's contractual rights against Contractor with respect to the breach of the obligations set forth in this Paragraph 8.03.B.

2. When Owner is performing other work at or adjacent to the Site with Owner's employees, Contractor shall be liable to Owner for damage to such other work, and for the reasonable direct delay, disruption, and interference costs incurred by Owner as a result of Contractor's failure to take reasonable and customary measures with respect to Owner's other work. In response to such damage, delay, disruption, or interference, Owner may impose a set-off against payments due Contractor.

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C. If Contractor damages, delays, disrupts, or interferes with the work of any other contractor, or any utility owner performing other work at or adjacent to the Site, through Contractor's failure to take reasonable and customary measures to avoid such impacts, or if any claim arising out of Contractor's actions, inactions, or negligence in performance of the Work at or adjacent to the Site is made by any such other contractor or utility owner against Contractor, Owner, or Engineer, then Contractor shall (1) promptly attempt to settle the claim as to all parties through negotiations with such other contractor or utility owner, or otherwise resolve the claim by arbitration or other dispute resolution proceeding or at law, and (2) indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against any such claims, and against all costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such damage, delay, disruption, or interference.

ARTICLE 9—OWNER'S RESPONSIBILITIES

9.01 *Communications to Contractor*

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

9.02 *Replacement of Engineer*

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

9.03 *Furnish Data*

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

9.04 *Pay When Due*

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

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

A. Owner's duties with respect to providing lands and easements are set forth in Paragraph 5.01.

B. Owner's duties with respect to providing engineering surveys to establish reference points are set forth in Paragraph 4.03.

C. Article 5 refers to Owner's identifying and making available to Contractor copies of reports of explorations and tests of conditions at the Site, and drawings of physical conditions relating to existing surface or subsurface structures at the Site.

9.06 *Insurance*

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

9.07 *Change Orders*

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

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9.08 *Inspections, Tests, and Approvals*

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

9.09 *Limitations on Owner's Responsibilities*

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

9.10 *Undisclosed Hazardous Environmental Condition*

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

9.11 *Evidence of Financial Arrangements*

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

9.12 *Safety Programs*

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

B. Owner shall furnish copies of any applicable Owner safety programs to Contractor.

ARTICLE 10—ENGINEER'S STATUS DURING CONSTRUCTION

10.01 *Owner's Representative*

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

10.02 *Visits to Site*

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

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B. Engineer's visits and observations are subject to all the limitations on Engineer's authority and responsibility set forth in Paragraph 10.07. Particularly, but without limitation, during or as a result of Engineer's visits or observations of Contractor's Work, Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work.

10.03 *Resident Project Representative*

A. If Owner and Engineer have agreed that Engineer will furnish a Resident Project Representative to represent Engineer at the Site and assist Engineer in observing the progress and quality of the Work, then the authority and responsibilities of any such Resident Project Representative will be as provided in the Supplementary Conditions, and limitations on the responsibilities thereof will be as provided in the Supplementary Conditions and in Paragraph 10.07.

B. If Owner designates an individual or entity who is not Engineer's consultant, agent, or employee to represent Owner at the Site, then the responsibilities and authority of such individual or entity will be as provided in the Supplementary Conditions.

10.04 *Engineer's Authority*

A. Engineer has the authority to reject Work in accordance with Article 14.

B. Engineer's authority as to Submittals is set forth in Paragraph 7.16.

C. Engineer's authority as to design drawings, calculations, specifications, certifications and other Submittals from Contractor in response to Owner's delegation (if any) to Contractor of professional design services, is set forth in Paragraph 7.19.

D. Engineer's authority as to changes in the Work is set forth in Article 11.

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

10.05 *Determinations for Unit Price Work*

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

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

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

10.07 *Limitations on Engineer's Authority and Responsibilities*

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

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

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

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

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

10.08 *Compliance with Safety Program*

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

ARTICLE 11—CHANGES TO THE CONTRACT

11.01 *Amending and Supplementing the Contract*

A. The Contract may be amended or supplemented by a Change Order, a Work Change Directive, or a Field Order.

B. If an amendment or supplement to the Contract includes a change in the Contract Price or the Contract Times, such amendment or supplement must be set forth in a Change Order.

C. All changes to the Contract that involve (1) the performance or acceptability of the Work, (2) the design (as set forth in the Drawings, Specifications, or otherwise), or (3) other engineering or technical matters, must be supported by Engineer's recommendation. Owner and Contractor may amend other terms and conditions of the Contract without the recommendation of the Engineer.

11.02 *Change Orders*

A. Owner and Contractor shall execute appropriate Change Orders covering:

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1. Changes in Contract Price or Contract Times which are agreed to by the parties, including any undisputed sum or amount of time for Work actually performed in accordance with a Work Change Directive;

2. Changes in Contract Price resulting from an Owner set-off, unless Contractor has duly contested such set-off;

3. Changes in the Work which are: (a) ordered by Owner pursuant to Paragraph 11.05, (b) required because of Owner's acceptance of defective Work under Paragraph 14.04 or Owner's correction of defective Work under Paragraph 14.07, or (c) agreed to by the parties, subject to the need for Engineer's recommendation if the change in the Work involves the design (as set forth in the Drawings, Specifications, or otherwise) or other engineering or technical matters; and

4. Changes that embody the substance of any final and binding results under: Paragraph 11.03.B, resolving the impact of a Work Change Directive; Paragraph 11.09, concerning Change Proposals; Article 12, Claims; Paragraph 13.02.D, final adjustments resulting from allowances; Paragraph 13.03.D, final adjustments relating to determination of quantities for Unit Price Work; and similar provisions.

B. If Owner or Contractor refuses to execute a Change Order that is required to be executed under the terms of Paragraph 11.02.A, it will be deemed to be of full force and effect, as if fully executed.

11.03 *Work Change Directives*

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

B. If Owner has issued a Work Change Directive and:

1. Contractor believes that an adjustment in Contract Times or Contract Price is necessary, then Contractor shall submit any Change Proposal seeking such an adjustment no later than 30 days after the completion of the Work set out in the Work Change Directive.

2. Owner believes that an adjustment in Contract Times or Contract Price is necessary, then Owner shall submit any Claim seeking such an adjustment no later than 60 days after issuance of the Work Change Directive.

11.04 *Field Orders*

A. Engineer may authorize minor changes in the Work if the changes do not involve an adjustment in the Contract Price or the Contract Times and are compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. Such changes will be accomplished by a Field Order and will be binding on Owner and also on Contractor, which shall perform the Work involved promptly.

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B. If Contractor believes that a Field Order justifies an adjustment in the Contract Price or Contract Times, then before proceeding with the Work at issue, Contractor shall submit a Change Proposal as provided herein.

11.05 *Owner-Authorized Changes in the Work*

A. Without invalidating the Contract and without notice to any surety, Owner may, at any time or from time to time, order additions, deletions, or revisions in the Work. Changes involving the design (as set forth in the Drawings, Specifications, or otherwise) or other engineering or technical matters will be supported by Engineer's recommendation.

B. Such changes in the Work may be accomplished by a Change Order, if Owner and Contractor have agreed as to the effect, if any, of the changes on Contract Times or Contract Price; or by a Work Change Directive. Upon receipt of any such document, Contractor shall promptly proceed with the Work involved; or, in the case of a deletion in the Work, promptly cease construction activities with respect to such deleted Work. Added or revised Work must be performed under the applicable conditions of the Contract Documents.

C. Nothing in this Paragraph 11.05 obligates Contractor to undertake work that Contractor reasonably concludes cannot be performed in a manner consistent with Contractor's safety obligations under the Contract Documents or Laws and Regulations.

11.06 *Unauthorized Changes in the Work*

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

11.07 *Change of Contract Price*

A. The Contract Price may only be changed by a Change Order. Any Change Proposal for an adjustment in the Contract Price must comply with the provisions of Paragraph 11.09. Any Claim for an adjustment of Contract Price must comply with the provisions of Article 12.

B. An adjustment in the Contract Price will be determined as follows:

1. Where the Work involved is covered by unit prices contained in the Contract Documents, then by application of such unit prices to the quantities of the items involved (subject to the provisions of Paragraph 13.03);

2. Where the Work involved is not covered by unit prices contained in the Contract Documents, then by a mutually agreed lump sum (which may include an allowance for overhead and profit not necessarily in accordance with Paragraph 11.07.C.2); or

3. Where the Work involved is not covered by unit prices contained in the Contract Documents and the parties do not reach mutual agreement to a lump sum, then on the basis of the Cost of the Work (determined as provided in Paragraph 13.01) plus a Contractor's fee for overhead and profit (determined as provided in Paragraph 11.07.C).

C. *Contractor's Fee*: When applicable, the Contractor's fee for overhead and profit will be determined as follows:

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1. A mutually acceptable fixed fee; or

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

11.08 *Change of Contract Times*

A. The Contract Times may only be changed by a Change Order. Any Change Proposal for an adjustment in the Contract Times must comply with the provisions of Paragraph 11.09. Any Claim for an adjustment in the Contract Times must comply with the provisions of Article 12.

B. Delay, disruption, and interference in the Work, and any related changes in Contract Times, are addressed in and governed by Paragraph 4.05.

11.09 *Change Proposals*

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

B. *Change Proposal Procedures*

1. *Submittal*: Contractor shall submit each Change Proposal to Engineer within 30 days after the start of the event giving rise thereto, or after such initial decision.

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

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

3. *Engineer's Initial Review*: Engineer will advise Owner regarding the Change Proposal, and consider any comments or response from Owner regarding the Change Proposal. If in its discretion Engineer concludes that additional supporting data is needed before conducting a full review and making a decision regarding the Change Proposal, then Engineer may request that Contractor submit such additional supporting data by a date specified by Engineer, prior to Engineer beginning its full review of the Change Proposal.

4. *Engineer's Full Review and Action on the Change Proposal:* Upon receipt of Contractor's supporting data (including any additional data requested by Engineer), Engineer will conduct a full review of each Change Proposal and, within 30 days after such receipt of the Contractor's supporting data, either approve the Change Proposal in whole, deny it in whole, or approve it in part and deny it in part. Such actions must be in writing, with a copy provided to Owner and Contractor. If Engineer does not take action on the Change Proposal within 30 days, then either Owner or Contractor may at any time thereafter submit a letter to the other party indicating that as a result of Engineer's inaction the Change Proposal is deemed denied, thereby commencing the time for appeal of the denial under Article 12.

5. *Binding Decision*: Engineer's decision is final and binding upon Owner and Contractor, unless Owner or Contractor appeals the decision by filing a Claim under Article 12.

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C. *Resolution of Certain Change Proposals*: If the Change Proposal does not involve the design (as set forth in the Drawings, Specifications, or otherwise), the acceptability of the Work, or other engineering or technical matters, then Engineer will notify the parties in writing that the Engineer is unable to resolve the Change Proposal. For purposes of further resolution of such a Change Proposal, such notice will be deemed a denial, and Contractor may choose to seek resolution under the terms of Article 12.

D. *Post-Completion*: Contractor shall not submit any Change Proposals after Engineer issues a written recommendation of final payment pursuant to Paragraph 15.06.B.

11.10 *Notification to Surety*

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

ARTICLE 12—CLAIMS

12.01 *Claims*

A. *Claims Process:* The following disputes between Owner and Contractor are subject to the Claims process set forth in this article:

1. Appeals by Owner or Contractor of Engineer's decisions regarding Change Proposals;

2. Owner demands for adjustments in the Contract Price or Contract Times, or other relief under the Contract Documents;

3. Disputes that Engineer has been unable to address because they do not involve the design (as set forth in the Drawings, Specifications, or otherwise), the acceptability of the Work, or other engineering or technical matters; and

4. Subject to the waiver provisions of Paragraph 15.07, any dispute arising after Engineer has issued a written recommendation of final payment pursuant to Paragraph 15.06.B.

B. *Submittal of Claim*: The party submitting a Claim shall deliver it directly to the other party to the Contract promptly (but in no event later than 30 days) after the start of the event giving rise thereto; in the case of appeals regarding Change Proposals within 30 days of the decision under appeal. The party submitting the Claim shall also furnish a copy to the Engineer, for its information only. The responsibility to substantiate a Claim rests with the party making the Claim. In the case of a Claim by Contractor seeking an increase in the Contract Times or Contract Price, Contractor shall certify that the Claim is made in good faith, that the supporting data are accurate and complete, and that to the best of Contractor's knowledge and belief the amount of time or money requested accurately reflects the full amount to which Contractor is entitled.

C. *Review and Resolution*: The party receiving a Claim shall review it thoroughly, giving full consideration to its merits. The two parties shall seek to resolve the Claim through the exchange of information and direct negotiations. The parties may extend the time for resolving the Claim by mutual agreement. All actions taken on a Claim will be stated in writing and submitted to the other party, with a copy to Engineer.

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D. *Mediation*

1. At any time after initiation of a Claim, Owner and Contractor may mutually agree to mediation of the underlying dispute. The agreement to mediate will stay the Claim submittal and response process.

2. If Owner and Contractor agree to mediation, then after 60 days from such agreement, either Owner or Contractor may unilaterally terminate the mediation process, and the Claim submittal and decision process will resume as of the date of the termination. If the mediation proceeds but is unsuccessful in resolving the dispute, the Claim submittal and decision process will resume as of the date of the conclusion of the mediation, as determined by the mediator.

3. Owner and Contractor shall each pay one-half of the mediator's fees and costs.

E. *Partial Approval*: If the party receiving a Claim approves the Claim in part and denies it in part, such action will be final and binding unless within 30 days of such action the other party invokes the procedure set forth in Article 17 for final resolution of disputes.

F. *Denial of Claim*: If efforts to resolve a Claim are not successful, the party receiving the Claim may deny it by giving written notice of denial to the other party. If the receiving party does not take action on the Claim within 90 days, then either Owner or Contractor may at any time thereafter submit a letter to the other party indicating that as a result of the inaction, the Claim is deemed denied, thereby commencing the time for appeal of the denial. A denial of the Claim will be final and binding unless within 30 days of the denial the other party invokes the procedure set forth in Article 17 for the final resolution of disputes.

G. *Final and Binding Results*: If the parties reach a mutual agreement regarding a Claim, whether through approval of the Claim, direct negotiations, mediation, or otherwise; or if a Claim is approved in part and denied in part, or denied in full, and such actions become final and binding; then the results of the agreement or action on the Claim will be incorporated in a Change Order or other written document to the extent they affect the Contract, including the Work, the Contract Times, or the Contract Price.

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

13.01 *Cost of the Work*

A. *Purposes for Determination of Cost of the Work:* The term Cost of the Work means the sum of all costs necessary for the proper performance of the Work at issue, as further defined below. The provisions of this Paragraph 13.01 are used for two distinct purposes:

1. To determine Cost of the Work when Cost of the Work is a component of the Contract Price, under cost-plus-fee, time-and-materials, or other cost-based terms; or

2. When needed to determine the value of a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price. When the value of any such adjustment is determined on the basis of Cost of the Work, Contractor is entitled only to those additional or incremental costs required because of the change in the Work or because of the event giving rise to the adjustment.

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B. *Costs Included*: Except as otherwise may be agreed to in writing by Owner, costs included in the Cost of the Work will be in amounts no higher than those commonly incurred in the locality of the Project, will not include any of the costs itemized in Paragraph 13.01.C, and will include only the following items:

1. Payroll costs for employees in the direct employ of Contractor in the performance of the Work under schedules of job classifications agreed upon by Owner and Contractor in advance of the subject Work. Such employees include, without limitation, superintendents, foremen, safety managers, safety representatives, and other personnel employed full time on the Work. Payroll costs for employees not employed full time on the Work will be apportioned on the basis of their time spent on the Work. Payroll costs include, but are not limited to, salaries and wages plus the cost of fringe benefits, which include social security contributions, unemployment, excise, and payroll taxes, workers' compensation, health and retirement benefits, sick leave, and vacation and holiday pay applicable thereto. The expenses of performing Work outside of regular working hours, on Saturday, Sunday, or legal holidays, will be included in the above to the extent authorized by Owner.

2. Cost of all materials and equipment furnished and incorporated in the Work, including costs of transportation and storage thereof, and Suppliers' field services required in connection therewith. All cash discounts accrue to Contractor unless Owner deposits funds with Contractor with which to make payments, in which case the cash discounts will accrue to Owner. All trade discounts, rebates, and refunds and returns from sale of surplus materials and equipment will accrue to Owner, and Contractor shall make provisions so that they may be obtained.

3. Payments made by Contractor to Subcontractors for Work performed by Subcontractors. If required by Owner, Contractor shall obtain competitive bids from subcontractors acceptable to Owner and Contractor and shall deliver such bids to Owner, which will then determine, with the advice of Engineer, which bids, if any, will be acceptable. If any subcontract provides that the Subcontractor is to be paid on the basis of Cost of the Work plus a fee, the Subcontractor's Cost of the Work and fee will be determined in the same manner as Contractor's Cost of the Work and fee as provided in this Paragraph 13.01.

4. Costs of special consultants (including but not limited to engineers, architects, testing laboratories, surveyors, attorneys, and accountants) employed or retained for services specifically related to the Work.

5. Other costs consisting of the following:
   a. The proportion of necessary transportation, travel, and subsistence expenses of Contractor's employees incurred in discharge of duties connected with the Work.
   b. Cost, including transportation and maintenance, of all materials, supplies, equipment, machinery, appliances, office, and temporary facilities at the Site, which are consumed in the performance of the Work, and cost, less market value, of such items used but not consumed which remain the property of Contractor.

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

c. *Construction Equipment Rental*

1) Rentals of all construction equipment and machinery, and the parts thereof, in accordance with rental agreements approved by Owner as to price (including any surcharge or special rates applicable to overtime use of the construction equipment or machinery), and the costs of transportation, loading, unloading, assembly, dismantling, and removal thereof. All such costs will be in accordance with the terms of said rental agreements. The rental of any such equipment, machinery, or parts must cease when the use thereof is no longer necessary for the Work.

2) Costs for equipment and machinery owned by Contractor or a Contractor-related entity will be paid at a rate shown for such equipment in the equipment rental rate book specified in the Supplementary Conditions. An hourly rate will be computed by dividing the monthly rates by 176. These computed rates will include all operating costs.

3) With respect to Work that is the result of a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price ("changed Work"), included costs will be based on the time the equipment or machinery is in use on the changed Work and the costs of transportation, loading, unloading, assembly, dismantling, and removal when directly attributable to the changed Work. The cost of any such equipment or machinery, or parts thereof, must cease to accrue when the use thereof is no longer necessary for the changed Work.

d. Sales, consumer, use, and other similar taxes related to the Work, and for which Contractor is liable, as imposed by Laws and Regulations.

e. Deposits lost for causes other than negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, and royalty payments and fees for permits and licenses.

f. Losses and damages (and related expenses) caused by damage to the Work, not compensated by insurance or otherwise, sustained by Contractor in connection with the performance of the Work (except losses and damages within the deductible amounts of builder's risk or other property insurance established in accordance with Paragraph 6.04), provided such losses and damages have resulted from causes other than the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable. Such losses include settlements made with the written consent and approval of Owner. No such losses, damages, and expenses will be included in the Cost of the Work for the purpose of determining Contractor's fee.

g. The cost of utilities, fuel, and sanitary facilities at the Site.

h. Minor expenses such as communication service at the Site, express and courier services, and similar petty cash items in connection with the Work.

i. The costs of premiums for all bonds and insurance that Contractor is required by the Contract Documents to purchase and maintain.

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

1. Payroll costs and other compensation of Contractor's officers, executives, principals, general managers, engineers, architects, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expediters, timekeepers, clerks, and other personnel employed by Contractor, whether at the Site or in Contractor's principal or branch office for general administration of the Work and not specifically included in the agreed upon schedule of job classifications referred to in Paragraph 13.01.B.1 or specifically covered by Paragraph 13.01.B.4. The payroll costs and other compensation excluded here are to be considered administrative costs covered by the Contractor's fee.

2. The cost of purchasing, renting, or furnishing small tools and hand tools.

3. Expenses of Contractor's principal and branch offices other than Contractor's office at the Site.

4. Any part of Contractor's capital expenses, including interest on Contractor's capital employed for the Work and charges against Contractor for delinquent payments.

5. Costs due to the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not limited to, the correction of defective Work, disposal of materials or equipment wrongly supplied, and making good any damage to property.

6. Expenses incurred in preparing and advancing Claims.

7. Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in Paragraph 13.01.B.

D. *Contractor's Fee*

1. When the Work as a whole is performed on the basis of cost-plus-a-fee, then:
   a. Contractor's fee for the Work set forth in the Contract Documents as of the Effective Date of the Contract will be determined as set forth in the Agreement.
   b. for any Work covered by a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price on the basis of Cost of the Work, Contractor's fee will be determined as follows:
      1) When the fee for the Work as a whole is a percentage of the Cost of the Work, the fee will automatically adjust as the Cost of the Work changes.
      2) When the fee for the Work as a whole is a fixed fee, the fee for any additions or deletions will be determined in accordance with Paragraph 11.07.C.2.

2. When the Work as a whole is performed on the basis of a stipulated sum, or any other basis other than cost-plus-a-fee, then Contractor's fee for any Work covered by a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price on the basis of Cost of the Work will be determined in accordance with Paragraph 11.07.C.2.

E. *Documentation and Audit*: Whenever the Cost of the Work for any purpose is to be determined pursuant to this Article 13, Contractor and pertinent Subcontractors will establish and maintain records of the costs in accordance with generally accepted accounting practices. Subject to prior written notice, Owner will be afforded reasonable access, during normal business hours, to all Contractor's accounts, records, books, correspondence, instructions, drawings, receipts,

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vouchers, memoranda, and similar data relating to the Cost of the Work and Contractor's fee. Contractor shall preserve all such documents for a period of three years after the final payment by Owner. Pertinent Subcontractors will afford such access to Owner, and preserve such documents, to the same extent required of Contractor.

13.02 *Allowances*

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

B. *Cash Allowances:* Contractor agrees that:

1. the cash allowances include the cost to Contractor (less any applicable trade discounts) of materials and equipment required by the allowances to be delivered at the Site, and all applicable taxes; and

2. Contractor's costs for unloading and handling on the Site, labor, installation, overhead, profit, and other expenses contemplated for the cash allowances have been included in the Contract Price and not in the allowances, and no demand for additional payment for any of the foregoing will be valid.

C. *Owner's Contingency Allowance*: Contractor agrees that an Owner's contingency allowance, if any, is for the sole use of Owner to cover unanticipated costs.

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

13.03 *Unit Price Work*

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

B. The estimated quantities of items of Unit Price Work are not guaranteed and are solely for the purpose of comparison of Bids and determining an initial Contract Price. Payments to Contractor for Unit Price Work will be based on actual quantities.

C. Each unit price will be deemed to include an amount considered by Contractor to be adequate to cover Contractor's overhead and profit for each separately identified item.

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

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E. *Adjustments in Unit Price*

1. Contractor or Owner shall be entitled to an adjustment in the unit price with respect to an item of Unit Price Work if:
   a. the quantity of the item of Unit Price Work performed by Contractor differs materially and significantly from the estimated quantity of such item indicated in the Agreement; and
   b. Contractor's unit costs to perform the item of Unit Price Work have changed materially and significantly as a result of the quantity change.

2. The adjustment in unit price will account for and be coordinated with any related changes in quantities of other items of Work, and in Contractor's costs to perform such other Work, such that the resulting overall change in Contract Price is equitable to Owner and Contractor.

3. Adjusted unit prices will apply to all units of that item.

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

14.01 *Access to Work*

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

14.02 *Tests, Inspections, and Approvals*

A. Contractor shall give Engineer timely notice of readiness of the Work (or specific parts thereof) for all required inspections and tests, and shall cooperate with inspection and testing personnel to facilitate required inspections and tests.

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

C. If Laws or Regulations of any public body having jurisdiction require any Work (or part thereof) specifically to be inspected, tested, or approved by an employee or other representative of such public body, Contractor shall assume full responsibility for arranging and obtaining such inspections, tests, or approvals, pay all costs in connection therewith, and furnish Engineer the required certificates of inspection or approval.

D. Contractor shall be responsible for arranging, obtaining, and paying for all inspections and tests required:

1. by the Contract Documents, unless the Contract Documents expressly allocate responsibility for a specific inspection or test to Owner;

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2. to attain Owner's and Engineer's acceptance of materials or equipment to be incorporated in the Work;

3. by manufacturers of equipment furnished under the Contract Documents;

4. for testing, adjusting, and balancing of mechanical, electrical, and other equipment to be incorporated into the Work; and

5. for acceptance of materials, mix designs, or equipment submitted for approval prior to Contractor's purchase thereof for incorporation in the Work.

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

E. If the Contract Documents require the Work (or part thereof) to be approved by Owner, Engineer, or another designated individual or entity, then Contractor shall assume full responsibility for arranging and obtaining such approvals.

F. If any Work (or the work of others) that is to be inspected, tested, or approved is covered by Contractor without written concurrence of Engineer, Contractor shall, if requested by Engineer, uncover such Work for observation. Such uncovering will be at Contractor's expense unless Contractor had given Engineer timely notice of Contractor's intention to cover the same and Engineer had not acted with reasonable promptness in response to such notice.

14.03 *Defective Work*

A. *Contractor's Obligation*: It is Contractor's obligation to assure that the Work is not defective.

B. *Engineer's Authority*: Engineer has the authority to determine whether Work is defective, and to reject defective Work.

C. *Notice of Defects:* Prompt written notice of all defective Work of which Owner or Engineer has actual knowledge will be given to Contractor.

D. *Correction, or Removal and Replacement:* Promptly after receipt of written notice of defective Work, Contractor shall correct all such defective Work, whether or not fabricated, installed, or completed, or, if Engineer has rejected the defective Work, remove it from the Project and replace it with Work that is not defective.

E. *Preservation of Warranties:* When correcting defective Work, Contractor shall take no action that would void or otherwise impair Owner's special warranty and guarantee, if any, on said Work.

F. *Costs and Damages:* In addition to its correction, removal, and replacement obligations with respect to defective Work, Contractor shall pay all claims, costs, losses, and damages arising out of or relating to defective Work, including but not limited to the cost of the inspection, testing, correction, removal, replacement, or reconstruction of such defective Work, fines levied against Owner by governmental authorities because the Work is defective, and the costs of repair or replacement of work of others resulting from defective Work. Prior to final payment, if Owner and Contractor are unable to agree as to the measure of such claims, costs, losses, and damages resulting from defective Work, then Owner may impose a reasonable set-off against payments due under Article 15.

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14.04 *Acceptance of Defective Work*

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

14.05 *Uncovering Work*

A. Engineer has the authority to require additional inspection or testing of the Work, whether or not the Work is fabricated, installed, or completed.

B. If any Work is covered contrary to the written request of Engineer, then Contractor shall, if requested by Engineer, uncover such Work for Engineer's observation, and then replace the covering, all at Contractor's expense.

C. If Engineer considers it necessary or advisable that covered Work be observed by Engineer or inspected or tested by others, then Contractor, at Engineer's request, shall uncover, expose, or otherwise make available for observation, inspection, or testing as Engineer may require, that portion of the Work in question, and provide all necessary labor, material, and equipment.

1. If it is found that the uncovered Work is defective, Contractor shall be responsible for all claims, costs, losses, and damages arising out of or relating to such uncovering, exposure, observation, inspection, and testing, and of satisfactory replacement or reconstruction (including but not limited to all costs of repair or replacement of work of others); and pending Contractor's full discharge of this responsibility the Owner shall be entitled to impose a reasonable set-off against payments due under Article 15.

2. If the uncovered Work is not found to be defective, Contractor shall be allowed an increase in the Contract Price or an extension of the Contract Times, directly attributable to such uncovering, exposure, observation, inspection, testing, replacement, and reconstruction. If the parties are unable to agree as to the amount or extent thereof, then Contractor may submit a Change Proposal within 30 days of the determination that the Work is not defective.

14.06 *Owner May Stop the Work*

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

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right for the benefit of Contractor, any Subcontractor, any Supplier, any other individual or entity, or any surety for, or employee or agent of any of them.

14.07 *Owner May Correct Defective Work*

A. If Contractor fails within a reasonable time after written notice from Engineer to correct defective Work, or to remove and replace defective Work as required by Engineer, then Owner may, after 7 days' written notice to Contractor, correct or remedy any such deficiency.

B. In exercising the rights and remedies under this Paragraph 14.07, Owner shall proceed expeditiously. In connection with such corrective or remedial action, Owner may exclude Contractor from all or part of the Site, take possession of all or part of the Work and suspend Contractor's services related thereto, and incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere. Contractor shall allow Owner, Owner's representatives, agents and employees, Owner's other contractors, and Engineer and Engineer's consultants access to the Site to enable Owner to exercise the rights and remedies under this paragraph.

C. All claims, costs, losses, and damages incurred or sustained by Owner in exercising the rights and remedies under this Paragraph 14.07 will be charged against Contractor as set-offs against payments due under Article 15. Such claims, costs, losses and damages will include but not be limited to all costs of repair, or replacement of work of others destroyed or damaged by correction, removal, or replacement of Contractor's defective Work.

D. Contractor shall not be allowed an extension of the Contract Times because of any delay in the performance of the Work attributable to the exercise by Owner of Owner's rights and remedies under this Paragraph 14.07.

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

15.01 *Progress Payments*

A. Basis for Progress Payments: The Schedule of Values established as provided in Article 2 will serve as the basis for progress payments and will be incorporated into a form of Application for Payment acceptable to Engineer. Progress payments for Unit Price Work will be based on the number of units completed during the pay period, as determined under the provisions of Paragraph 13.03. Progress payments for cost-based Work will be based on Cost of the Work completed by Contractor during the pay period.

B. *Applications for Payments*

1. At least 20 days before the date established in the Agreement for each progress payment (but not more often than once a month), Contractor shall submit to Engineer for review an Application for Payment filled out and signed by Contractor covering the Work completed as of the date of the Application and accompanied by such supporting documentation as is required by the Contract Documents.

2. If payment is requested on the basis of materials and equipment not incorporated in the Work but delivered and suitably stored at the Site or at another location agreed to in writing, the Application for Payment must also be accompanied by: (a) a bill of sale, invoice, copies of subcontract or purchase order payments, or other documentation establishing

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

3. Beginning with the second Application for Payment, each Application must include an affidavit of Contractor stating that all previous progress payments received by Contractor have been applied to discharge Contractor's legitimate obligations associated with prior Applications for Payment.

4. The amount of retainage with respect to progress payments will be as stipulated in the Agreement.

C. *Review of Applications*

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

2. Engineer's recommendation of any payment requested in an Application for Payment will constitute a representation by Engineer to Owner, based on Engineer's observations of the executed Work as an experienced and qualified design professional, and on Engineer's review of the Application for Payment and the accompanying data and schedules, that to the best of Engineer's knowledge, information and belief:
   a. the Work has progressed to the point indicated;
   b. the quality of the Work is generally in accordance with the Contract Documents (subject to an evaluation of the Work as a functioning whole prior to or upon Substantial Completion, the results of any subsequent tests called for in the Contract Documents, a final determination of quantities and classifications for Unit Price Work under Paragraph 13.03, and any other qualifications stated in the recommendation); and
   c. the conditions precedent to Contractor's being entitled to such payment appear to have been fulfilled in so far as it is Engineer's responsibility to observe the Work.

3. By recommending any such payment Engineer will not thereby be deemed to have represented that:
   a. inspections made to check the quality or the quantity of the Work as it has been performed have been exhaustive, extended to every aspect of the Work in progress, or involved detailed inspections of the Work beyond the responsibilities specifically assigned to Engineer in the Contract; or
   b. there may not be other matters or issues between the parties that might entitle Contractor to be paid additionally by Owner or entitle Owner to withhold payment to Contractor.

4. Neither Engineer's review of Contractor's Work for the purposes of recommending payments nor Engineer's recommendation of any payment, including final payment, will impose responsibility on Engineer:

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a. to supervise, direct, or control the Work;
b. for the means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto;
c. for Contractor's failure to comply with Laws and Regulations applicable to Contractor's performance of the Work;
d. to make any examination to ascertain how or for what purposes Contractor has used the money paid by Owner; or
e. to determine that title to any of the Work, materials, or equipment has passed to Owner free and clear of any Liens.

5. Engineer may refuse to recommend the whole or any part of any payment if, in Engineer's opinion, it would be incorrect to make the representations to Owner stated in Paragraph 15.01.C.2.

6. Engineer will recommend reductions in payment (set-offs) necessary in Engineer's opinion to protect Owner from loss because:
   a. the Work is defective, requiring correction or replacement;
   b. the Contract Price has been reduced by Change Orders;
   c. Owner has been required to correct defective Work in accordance with Paragraph 14.07, or has accepted defective Work pursuant to Paragraph 14.04;
   d. Owner has been required to remove or remediate a Hazardous Environmental Condition for which Contractor is responsible; or
   e. Engineer has actual knowledge of the occurrence of any of the events that would constitute a default by Contractor and therefore justify termination for cause under the Contract Documents.

D. *Payment Becomes Due*

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

E. *Reductions in Payment by Owner*

1. In addition to any reductions in payment (set-offs) recommended by Engineer, Owner is entitled to impose a set-off against payment based on any of the following:
   a. Claims have been made against Owner based on Contractor's conduct in the performance or furnishing of the Work, or Owner has incurred costs, losses, or damages resulting from Contractor's conduct in the performance or furnishing of the Work, including but not limited to claims, costs, losses, or damages from workplace injuries, adjacent property damage, non-compliance with Laws and Regulations, and patent infringement;
   b. Contractor has failed to take reasonable and customary measures to avoid damage, delay, disruption, and interference with other work at or adjacent to the Site;
   c. Contractor has failed to provide and maintain required bonds or insurance;
   d. Owner has been required to remove or remediate a Hazardous Environmental Condition for which Contractor is responsible;

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e. Owner has incurred extra charges or engineering costs related to submittal reviews, evaluations of proposed substitutes, tests and inspections, or return visits to manufacturing or assembly facilities;
f. The Work is defective, requiring correction or replacement;
g. Owner has been required to correct defective Work in accordance with Paragraph 14.07, or has accepted defective Work pursuant to Paragraph 14.04;
h. The Contract Price has been reduced by Change Orders;
i. An event has occurred that would constitute a default by Contractor and therefore justify a termination for cause;
j. Liquidated or other damages have accrued as a result of Contractor's failure to achieve Milestones, Substantial Completion, or final completion of the Work;
k. Liens have been filed in connection with the Work, except where Contractor has delivered a specific bond satisfactory to Owner to secure the satisfaction and discharge of such Liens; or
l. Other items entitle Owner to a set-off against the amount recommended.

2. If Owner imposes any set-off against payment, whether based on its own knowledge or on the written recommendations of Engineer, Owner will give Contractor immediate written notice (with a copy to Engineer) stating the reasons for such action and the specific amount of the reduction, and promptly pay Contractor any amount remaining after deduction of the amount so withheld. Owner shall promptly pay Contractor the amount so withheld, or any adjustment thereto agreed to by Owner and Contractor, if Contractor remedies the reasons for such action. The reduction imposed will be binding on Contractor unless it duly submits a Change Proposal contesting the reduction.

3. Upon a subsequent determination that Owner's refusal of payment was not justified, the amount wrongfully withheld will be treated as an amount due as determined by Paragraph 15.01.D.1 and subject to interest as provided in the Agreement.

15.02 *Contractor's Warranty of Title*

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

15.03 *Substantial Completion*

A. When Contractor considers the entire Work ready for its intended use Contractor shall notify Owner and Engineer in writing that the entire Work is substantially complete and request that Engineer issue a certificate of Substantial Completion. Contractor shall at the same time submit to Owner and Engineer an initial draft of punch list items to be completed or corrected before final payment.

B. Promptly after Contractor's notification, Owner, Contractor, and Engineer shall make an inspection of the Work to determine the status of completion. If Engineer does not consider the Work substantially complete, Engineer will notify Contractor in writing giving the reasons therefor.

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C. If Engineer considers the Work substantially complete, Engineer will deliver to Owner a preliminary certificate of Substantial Completion which will fix the date of Substantial Completion. Engineer shall attach to the certificate a punch list of items to be completed or corrected before final payment. Owner shall have 7 days after receipt of the preliminary certificate during which to make written objection to Engineer as to any provisions of the certificate or attached punch list. If, after considering the objections to the provisions of the preliminary certificate, Engineer concludes that the Work is not substantially complete, Engineer will, within 14 days after submission of the preliminary certificate to Owner, notify Contractor in writing that the Work is not substantially complete, stating the reasons therefor. If Owner does not object to the provisions of the certificate, or if despite consideration of Owner's objections Engineer concludes that the Work is substantially complete, then Engineer will, within said 14 days, execute and deliver to Owner and Contractor a final certificate of Substantial Completion (with a revised punch list of items to be completed or corrected) reflecting such changes from the preliminary certificate as Engineer believes justified after consideration of any objections from Owner.

D. At the time of receipt of the preliminary certificate of Substantial Completion, Owner and Contractor will confer regarding Owner's use or occupancy of the Work following Substantial Completion, review the builder's risk insurance policy with respect to the end of the builder's risk coverage, and confirm the transition to coverage of the Work under a permanent property insurance policy held by Owner. Unless Owner and Contractor agree otherwise in writing, Owner shall bear responsibility for security, operation, protection of the Work, property insurance, maintenance, heat, and utilities upon Owner's use or occupancy of the Work.

E. After Substantial Completion, the Contractor shall promptly begin work on the punch list of items to be completed or corrected prior to final payment. In appropriate cases Contractor may submit monthly Applications for Payment for completed punch list items, following the progress payment procedures set forth above.

F. Owner shall have the right to exclude Contractor from the Site after the date of Substantial Completion subject to allowing Contractor reasonable access to remove its property and complete or correct items on the punch list.

15.04 *Partial Use or Occupancy*

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

1. At any time, Owner may request in writing that Contractor permit Owner to use or occupy any such part of the Work that Owner believes to be substantially complete. If and when Contractor agrees that such part of the Work is substantially complete, Contractor, Owner, and Engineer will follow the procedures of Paragraph 15.03.A through 15.03.E for that part of the Work.

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2. At any time, Contractor may notify Owner and Engineer in writing that Contractor considers any such part of the Work substantially complete and request Engineer to issue a certificate of Substantial Completion for that part of the Work.

3. Within a reasonable time after either such request, Owner, Contractor, and Engineer shall make an inspection of that part of the Work to determine its status of completion. If Engineer does not consider that part of the Work to be substantially complete, Engineer will notify Owner and Contractor in writing giving the reasons therefor. If Engineer considers that part of the Work to be substantially complete, the provisions of Paragraph 15.03 will apply with respect to certification of Substantial Completion of that part of the Work and the division of responsibility in respect thereof and access thereto.

4. No use or occupancy or separate operation of part of the Work may occur prior to compliance with the requirements of Paragraph 6.04 regarding builder's risk or other property insurance.

15.05 *Final Inspection*

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

15.06 *Final Payment*

A. *Application for Payment*

1. After Contractor has, in the opinion of Engineer, satisfactorily completed all corrections identified during the final inspection and has delivered, in accordance with the Contract Documents, all maintenance and operating instructions, schedules, guarantees, bonds, certificates or other evidence of insurance, certificates of inspection, annotated record documents (as provided in Paragraph 7.12), and other documents, Contractor may make application for final payment.

2. The final Application for Payment must be accompanied (except as previously delivered) by:
   a. all documentation called for in the Contract Documents;
   b. consent of the surety, if any, to final payment;
   c. satisfactory evidence that all title issues have been resolved such that title to all Work, materials, and equipment has passed to Owner free and clear of any Liens or other title defects, or will so pass upon final payment.
   d. a list of all duly pending Change Proposals and Claims; and
   e. complete and legally effective releases or waivers (satisfactory to Owner) of all Lien rights arising out of the Work, and of Liens filed in connection with the Work.

3. In lieu of the releases or waivers of Liens specified in Paragraph 15.06.A.2 and as approved by Owner, Contractor may furnish receipts or releases in full and an affidavit of Contractor that: (a) the releases and receipts include all labor, services, material, and equipment for which a Lien could be filed; and (b) all payrolls, material and equipment bills, and other indebtedness connected with the Work for which Owner might in any way be responsible,

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or which might in any way result in liens or other burdens on Owner's property, have been paid or otherwise satisfied. If any Subcontractor or Supplier fails to furnish such a release or receipt in full, Contractor may furnish a bond or other collateral satisfactory to Owner to indemnify Owner against any Lien, or Owner at its option may issue joint checks payable to Contractor and specified Subcontractors and Suppliers.

B. *Engineer's Review of Final Application and Recommendation of Payment*: If, on the basis of Engineer's observation of the Work during construction and final inspection, and Engineer's review of the final Application for Payment and accompanying documentation as required by the Contract Documents, Engineer is satisfied that the Work has been completed and Contractor's other obligations under the Contract have been fulfilled, Engineer will, within 10 days after receipt of the final Application for Payment, indicate in writing Engineer's recommendation of final payment and present the final Application for Payment to Owner for payment. Such recommendation will account for any set-offs against payment that are necessary in Engineer's opinion to protect Owner from loss for the reasons stated above with respect to progress payments. Otherwise, Engineer will return the Application for Payment to Contractor, indicating in writing the reasons for refusing to recommend final payment, in which case Contractor shall make the necessary corrections and resubmit the Application for Payment.

C. *Notice of Acceptability:* In support of its recommendation of payment of the final Application for Payment, Engineer will also give written notice to Owner and Contractor that the Work is acceptable, subject to stated limitations in the notice and to the provisions of Paragraph 15.07.

D. *Completion of Work:* The Work is complete (subject to surviving obligations) when it is ready for final payment as established by the Engineer's written recommendation of final payment and issuance of notice of the acceptability of the Work.

E. *Final Payment Becomes Due*: Upon receipt from Engineer of the final Application for Payment and accompanying documentation, Owner shall set off against the amount recommended by Engineer for final payment any further sum to which Owner is entitled, including but not limited to set-offs for liquidated damages and set-offs allowed under the provisions of this Contract with respect to progress payments. Owner shall pay the resulting balance due to Contractor within 30 days of Owner's receipt of the final Application for Payment from Engineer.

15.07 *Waiver of Claims*

A. By making final payment, Owner waives its claim or right to liquidated damages or other damages for late completion by Contractor, except as set forth in an outstanding Claim, appeal under the provisions of Article 17, set-off, or express reservation of rights by Owner. Owner reserves all other claims or rights after final payment.

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

15.08 *Correction Period*

A. If within one year after the date of Substantial Completion (or such longer period of time as may be prescribed by the Supplementary Conditions or the terms of any applicable special guarantee required by the Contract Documents), Owner gives Contractor written notice that any Work has been found to be defective, or that Contractor's repair of any damages to the Site or adjacent

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areas has been found to be defective, then after receipt of such notice of defect Contractor shall promptly, without cost to Owner and in accordance with Owner's written instructions:

1. correct the defective repairs to the Site or such adjacent areas;
2. correct such defective Work;
3. remove the defective Work from the Project and replace it with Work that is not defective, if the defective Work has been rejected by Owner, and
4. satisfactorily correct or repair or remove and replace any damage to other Work, to the work of others, or to other land or areas resulting from the corrective measures.

B. Owner shall give any such notice of defect within 60 days of the discovery that such Work or repairs is defective. If such notice is given within such 60 days but after the end of the correction period, the notice will be deemed a notice of defective Work under Paragraph 7.17.B.

C. If, after receipt of a notice of defect within 60 days and within the correction period, Contractor does not promptly comply with the terms of Owner's written instructions, or in an emergency where delay would cause serious risk of loss or damage, Owner may have the defective Work corrected or repaired or may have the rejected Work removed and replaced. Contractor shall pay all costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or repair or such removal and replacement (including but not limited to all costs of repair or replacement of work of others). Contractor's failure to pay such costs, losses, and damages within 10 days of invoice from Owner will be deemed the start of an event giving rise to a Claim under Paragraph 12.01.B, such that any related Claim must be brought within 30 days of the failure to pay.

D. In special circumstances where a particular item of equipment is placed in continuous service before Substantial Completion of all the Work, the correction period for that item may start to run from an earlier date if so provided in the Specifications.

E. Where defective Work (and damage to other Work resulting therefrom) has been corrected or removed and replaced under this paragraph, the correction period hereunder with respect to such Work will be extended for an additional period of one year after such correction or removal and replacement has been satisfactorily completed.

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

ARTICLE 16—SUSPENSION OF WORK AND TERMINATION

16.01 *Owner May Suspend Work*

A. At any time and without cause, Owner may suspend the Work or any portion thereof for a period of not more than 90 consecutive days by written notice to Contractor and Engineer. Such notice will fix the date on which Work will be resumed. Contractor shall resume the Work on the date so fixed. Contractor shall be entitled to an adjustment in the Contract Price or an extension of the Contract Times directly attributable to any such suspension. Any Change Proposal seeking

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such adjustments must be submitted no later than 30 days after the date fixed for resumption of Work.

16.02 *Owner May Terminate for Cause*

A. The occurrence of any one or more of the following events will constitute a default by Contractor and justify termination for cause:

1. Contractor's persistent failure to perform the Work in accordance with the Contract Documents (including, but not limited to, failure to supply sufficient skilled workers or suitable materials or equipment, or failure to adhere to the Progress Schedule);

2. Failure of Contractor to perform or otherwise to comply with a material term of the Contract Documents;

3. Contractor's disregard of Laws or Regulations of any public body having jurisdiction; or

4. Contractor's repeated disregard of the authority of Owner or Engineer.

B. If one or more of the events identified in Paragraph 16.02.A occurs, then after giving Contractor (and any surety) 10 days' written notice that Owner is considering a declaration that Contractor is in default and termination of the Contract, Owner may proceed to:

1. declare Contractor to be in default, and give Contractor (and any surety) written notice that the Contract is terminated; and

2. enforce the rights available to Owner under any applicable performance bond.

C. Subject to the terms and operation of any applicable performance bond, if Owner has terminated the Contract for cause, Owner may exclude Contractor from the Site, take possession of the Work, incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere, and complete the Work as Owner may deem expedient.

D. Owner may not proceed with termination of the Contract under Paragraph 16.02.B if Contractor within 7 days of receipt of notice of intent to terminate begins to correct its failure to perform and proceeds diligently to cure such failure.

E. If Owner proceeds as provided in Paragraph 16.02.B, Contractor shall not be entitled to receive any further payment until the Work is completed. If the unpaid balance of the Contract Price exceeds the cost to complete the Work, including all related claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals) sustained by Owner, such excess will be paid to Contractor. If the cost to complete the Work including such related claims, costs, losses, and damages exceeds such unpaid balance, Contractor shall pay the difference to Owner. Such claims, costs, losses, and damages incurred by Owner will be reviewed by Engineer as to their reasonableness and, when so approved by Engineer, incorporated in a Change Order. When exercising any rights or remedies under this paragraph, Owner shall not be required to obtain the lowest price for the Work performed.

F. Where Contractor's services have been so terminated by Owner, the termination will not affect any rights or remedies of Owner against Contractor then existing or which may thereafter accrue, or any rights or remedies of Owner against Contractor or any surety under any payment

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bond or performance bond. Any retention or payment of money due Contractor by Owner will not release Contractor from liability.

G. If and to the extent that Contractor has provided a performance bond under the provisions of Paragraph 6.01.A, the provisions of that bond will govern over any inconsistent provisions of Paragraphs 16.02.B and 16.02.D.

16.03 *Owner May Terminate for Convenience*

A. Upon 7 days' written notice to Contractor and Engineer, Owner may, without cause and without prejudice to any other right or remedy of Owner, terminate the Contract. In such case, Contractor shall be paid for (without duplication of any items):

1. completed and acceptable Work executed in accordance with the Contract Documents prior to the effective date of termination, including fair and reasonable sums for overhead and profit on such Work;

2. expenses sustained prior to the effective date of termination in performing services and furnishing labor, materials, or equipment as required by the Contract Documents in connection with uncompleted Work, plus fair and reasonable sums for overhead and profit on such expenses; and

3. other reasonable expenses directly attributable to termination, including costs incurred to prepare a termination for convenience cost proposal.

B. Contractor shall not be paid for any loss of anticipated profits or revenue, post-termination overhead costs, or other economic loss arising out of or resulting from such termination.

16.04 *Contractor May Stop Work or Terminate*

A. If, through no act or fault of Contractor, (1) the Work is suspended for more than 90 consecutive days by Owner or under an order of court or other public authority, or (2) Engineer fails to act on any Application for Payment within 30 days after it is submitted, or (3) Owner fails for 30 days to pay Contractor any sum finally determined to be due, then Contractor may, upon 7 days' written notice to Owner and Engineer, and provided Owner or Engineer do not remedy such suspension or failure within that time, terminate the contract and recover from Owner payment on the same terms as provided in Paragraph 16.03.

B. In lieu of terminating the Contract and without prejudice to any other right or remedy, if Engineer has failed to act on an Application for Payment within 30 days after it is submitted, or Owner has failed for 30 days to pay Contractor any sum finally determined to be due, Contractor may, 7 days after written notice to Owner and Engineer, stop the Work until payment is made of all such amounts due Contractor, including interest thereon. The provisions of this paragraph are not intended to preclude Contractor from submitting a Change Proposal for an adjustment in Contract Price or Contract Times or otherwise for expenses or damage directly attributable to Contractor's stopping the Work as permitted by this paragraph.

ARTICLE 17—FINAL RESOLUTION OF DISPUTES

17.01 *Methods and Procedures*

A. *Disputes Subject to Final Resolution:* The following disputed matters are subject to final resolution under the provisions of this article:

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1. A timely appeal of an approval in part and denial in part of a Claim, or of a denial in full, pursuant to Article 12; and

2. Disputes between Owner and Contractor concerning the Work, or obligations under the Contract Documents, that arise after final payment has been made.

B. *Final Resolution of Disputes*: For any dispute subject to resolution under this article, Owner or Contractor may:

1. elect in writing to invoke the dispute resolution process provided for in the Supplementary Conditions;

2. agree with the other party to submit the dispute to another dispute resolution process; or

3. if no dispute resolution process is provided for in the Supplementary Conditions or mutually agreed to, give written notice to the other party of the intent to submit the dispute to a court of competent jurisdiction.

ARTICLE 18—MISCELLANEOUS

18.01 *Giving Notice*

A. Whenever any provision of the Contract requires the giving of written notice to Owner, Engineer, or Contractor, it will be deemed to have been validly given only if delivered:

1. in person, by a commercial courier service or otherwise, to the recipient's place of business;

2. by registered or certified mail, postage prepaid, to the recipient's place of business; or

3. by e-mail to the recipient, with the words "Formal Notice" or similar in the e-mail's subject line.

18.02 *Computation of Times*

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

18.03 *Cumulative Remedies*

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

18.04 Limitation of Damages

A. With respect to any and all Change Proposals, Claims, disputes subject to final resolution, and other matters at issue, neither Owner nor Engineer, nor any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, shall be liable to

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Contractor for any claims, costs, losses, or damages sustained by Contractor on or in connection with any other project or anticipated project.

18.05 *No Waiver*

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

18.06 *Survival of Obligations*

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

18.07 *Controlling Law*

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

18.08 *Assignment of Contract*

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

18.09 *Successors and Assigns*

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

18.10 *Headings*

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

END OF DOCUMENT

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SUPPLEMENTARY CONDITIONS

These Supplementary Conditions amend or supplement EJCDC® C-700, Standard 00 72 00, General Conditions of the Construction Contract (2018). The General Conditions remain in full force and effect except as amended.

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

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

ARTICLE 1 DEFINITIONS AND TERMINOLOGY

The Specifications are written in imperative mood and streamlined form. This imperative language is directed to the Contractor, unless specifically noted otherwise. The words “shall be” are included by inference where a colon (:) is used within sentences or phrases.

SC-1.01.A.51 -55 – Add the following new paragraph immediately after Paragraph 1.01.A.50:

A.51 Notice of Violation - A written notification from a governmental agency that the Owner has violated a law or regulation that the agency has jurisdiction over. Notice will take the form used by the agency and may outline action to be taken by the Owner to correct the violation and may include a monetary fine.

A.52 The term "minority business" means a business:

A In which at least fifty-one percent (51%) is owned by one or more minority persons or socially and economically disadvantaged individuals, or in the case of a corporation, in which at least fifty-one percent (51%) of the stock is owned by one or more minority persons or socially and economically disadvantaged individuals; and

B Of which the management and daily business operations are controlled by one or more of the minority persons or socially and economically disadvantaged individuals who own it.

A.53 The term "minority person" means a person who is a citizen or lawful permanent resident of the United States and who is:

A Black, that is, a person having origins in any of the black racial groups in Africa;

B Hispanic, that is, a person of Spanish or Portuguese culture with origins in Mexico, South or Central America, or the Caribbean Islands, regardless of race;

C Asian American, that is, a person having origins in any of the original peoples of the Far East, Southeast Asia and Asia, the Indian subcontinent, or the Pacific Islands;

D American Indian, that is, a person having origins in any of the original Indian peoples of North America; or

E Female.

A.54 The term "socially and economically disadvantaged individual" means the same as defined in 15 U.S.C. 637; “Socially disadvantaged individuals are those who have been subjected to racial or ethnic prejudice or cultural bias because of their identity as a member of a group without regard to their individual qualities”. “Economically disadvantaged individuals are those socially disadvantaged individuals whose ability to compete in the free enterprise system has been impaired due to diminished capital and credit opportunities as compared to others in the same business area who are not socially disadvantaged.”

A.55 Regular Working Hours: Regular working hours for the project are defined as 8:00 am to 5:00 pm, Eastern Standard Time.

ARTICLE 2 PRELIMINARY MATTERS

2.02 *Copies of Documents*

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

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

ARTICLE 3 CONTRACT DOCUMENTS: INTENT, REQUIREMENTS, REUSE

3.01 *Intent*

SC-3.01.F Add the following paragraph after 3.01.F:

3.01.G Division 1, General Requirements, govern the execution of all sections of the specifications.

ARTICLE SC-4 COMMENCEMENT AND PROGRESS OF THE WORK

SC-4.01.A – Delete paragraph 4.01.A in its entirety and insert the following in its place:

4.01.A The Contract Times will commence to run on the day indicated in the Notice to Proceed. A Notice to Proceed will be issued at any time within 30 days after the Effective Date of the Agreement or a date agreed to by the Owner and Contractor.

4.05 *Delays in Contractor's Progress*

SC-4.05 Amend Paragraph 4.05.C.2 by adding the following subparagraphs:

2. Abnormal Weather Conditions

A Time extension for weather delays due to rain shall only be considered for above average precipitation. Monthly Normals from the National Climate Data Center 1991-2020 Climate Normals shall be used to determine the average number of days with precipitation greater than or equal to 0.10 inch for each month. The 1991-2020 Climate Normals reports can be found via the following link: https://www.ncdc.noaa.gov/cdo-web/datatools/normals. Claims for weather-based delays shall be submitted each month with the pay request with the documentation supporting the claim comparing actual rain days (greater than 0.1 inches of rain) to normal number of rain days for the month. If Contractor does not maintain a rain gage at site, the closest NOAA weather station rainfall data will be used to determine the actual amount of rainfall for each day.

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

SC-5.03 Delete paragraph 5.03.A in its entirety and insert the following in its place:

5.03.A In the preparation of Drawings and Specifications, Engineer or Engineer's Consultants relied upon the following reports of explorations and tests of subsurface conditions at the Site:

One report of subsurface Exploration has been prepared by S&ME, Inc., 8646 West Market Street, Suite 105, Greensboro, North Carolina 27409, sealed by Stephen W. Lacz NCPE 30037. The report is as follows:

5.05 *Underground Facilities*

SC-5.05 Add the following to paragraph 5.05.A.2
Follow North Carolina General Statutes, Chapter 87, Article 8A Underground Utility Safety and Damage Prevention Act. Contact NC811.org before the start of excavation.

ARTICLE 6 BONDS AND INSURANCE

6.01 *Performance, Payment, and Other Bonds*

SC-6.01 Add the following paragraphs immediately after Paragraph 6.01.A:
1. *Required Performance Bond Form*: The performance bond that Contractor furnishes will be in the form of EJCDC® C-610 (2018 edition), Performance Bond.
2. *Required Payment Bond Form*: The payment bond that Contractor furnishes will be in the form of EJCDC® C-615 (2018 edition), Payment Bond.

6.02 *Insurance—General Provisions*

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

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

6.03 *Contractor's Insurance*

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

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

Workers' Compensation and Related Policies	Policy limits of not less than:
Workers' Compensation	
State	Statutory
Applicable Federal (e.g., Longshoreman's)	Statutory
Foreign voluntary workers' compensation (employer's responsibility coverage), if applicable	Statutory
Employer's Liability	
Each accident	$1,000,000
Each employee	$1,000,000
Policy limit	$1,000,000

F Commercial General Liability—Claims Covered: Contractor shall purchase and maintain commercial general liability insurance, covering all operations by or on behalf of Contractor, on an occurrence basis, against claims for:

1. damages because of bodily injury, sickness or disease, or death of any person other than Contractor's employees,

2. damages insured by reasonably available personal injury liability coverage, and

3. damages because of injury to or destruction of tangible property wherever located, including loss of use resulting therefrom.

G Commercial General Liability—Form and Content: Contractor's commercial liability policy must be written on a 1996 (or later) Insurance Services Organization, Inc. (ISO) commercial general liability form (occurrence form) and include the following coverages and endorsements:

A Products and completed operations coverage.

1. Such insurance must be maintained for three years after final payment.
2. Contractor shall furnish Owner and each other additional insured (as identified in the Supplementary Conditions or elsewhere in the Contract) evidence of continuation of such insurance at final payment and three years thereafter.

B Blanket contractual liability coverage, including but not limited to coverage of Contractor's contractual indemnity obligations in Paragraph 7.18.

C Severability of interests and no insured-versus-insured or cross-liability exclusions.

D Underground, explosion, and collapse coverage.

E Personal injury coverage.

F Additional insured endorsements that include both ongoing operations and products and completed operations coverage through ISO Endorsements CG 20 10 10 01 and CG 20 37 10 01 (together). If Contractor demonstrates to Owner that the specified ISO endorsements are not commercially available, then Contractor may satisfy this requirement by providing equivalent endorsements.

G For design professional additional insureds, ISO Endorsement CG 20 32 07 04 "Additional Insured—Engineers, Architects or Surveyors Not Engaged by the Named Insured" or its equivalent.

H Commercial General Liability—Excluded Content: The commercial general liability insurance policy, including its coverages, endorsements, and incorporated provisions, must not include any of the following:

1. Any modification of the standard definition of "insured contract" (except to delete the railroad protective liability exclusion if Contractor is required to indemnify a railroad or others with respect to Work within 50 feet of railroad property).
2. Any exclusion for water intrusion or water damage.
3. Any provisions resulting in the erosion of insurance limits by defense costs other than those already incorporated in ISO form CG 00 01.
4. Any exclusion of coverage relating to earth subsidence or movement.
5. Any exclusion for the insured's vicarious liability, strict liability, or statutory liability (other than worker's compensation).
6. Any limitation or exclusion based on the nature of Contractor's work.
7. Any professional liability exclusion broader in effect than the most recent edition of ISO form CG 22 79.

I Commercial General Liability—Minimum Policy Limits

Commercial General Liability	Policy limits of not less than:
General Aggregate	$2,000,000

Products—Completed Operations Aggregate	$2,000,000
Personal and Advertising Injury	$1,000,000
Bodily Injury and Property Damage—Each Occurrence	$2,000,000

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

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

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

Excess or Umbrella Liability	Policy limits of not less than:
Each Occurrence	$5,000,000
General Aggregate	$5,000,000

O Railroad Protective Liability Insurance: Prior to commencing any Work within 50 feet of railroad-owned and controlled property, Contractor shall (1) endorse its commercial general liability policy with ISO CG 24 17, removing the contractual liability exclusion for work within 50 feet of a railroad, (2) purchase and maintain railroad protective liability insurance meeting the following requirements, (3) furnish a copy of the endorsement to Owner, and (4) submit a copy of the railroad protective policy and other railroad-required documentation to the railroad, and notify Owner of such submittal.

6.04 *Builder's Risk and Other Property Insurance*

SC-6.04 Delete Paragraph 6.04.A of the General Conditions and substitute the following in its place:

A Installation Floater

1. Contractor shall provide and maintain installation floater insurance on a broad form or "all risk" policy providing coverage for materials, supplies, machinery, fixtures, and equipment that will be incorporated into the Work ("Covered Property"). Coverage under the Contractor's installation floater will include loss from covered "all risk" causes (perils) to Covered Property:
   a. of the Contractor, and Covered Property of others that is in Contractor's care, custody, and control;
   b. while in transit to the Site, including while at temporary storage sites;
   c. while at the Site awaiting and during installation, erection, and testing;

d. continuing at least until the installation or erection of the Covered Property is completed, and the Work into which it is incorporated is accepted by Owner.

2. The installation floater coverage cannot be contingent on an external cause or risk, or limited to property for which the Contractor is legally liable.
3. The installation floater coverage will be in an amount sufficient to protect Contractor's interest in the Covered Property. The Contractor will be solely responsible for any deductible carried under this coverage.
4. This policy will include a waiver of subrogation applicable to Owner, Contractor, Engineer, all Subcontractors, and the officers, directors, partners, employees, agents and other consultants and subcontractors of any of them.

ARTICLE 7 CONTRACTOR'S RESPONSIBILITIES

7.03 *Labor; Working Hours*

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

A Regular working hours will be 8:00 am to 5:00 pm.

SC-7.07.A – Amend by adding the following to the end of the paragraph:

The total amount of work subcontracted by the Contractor shall not exceed fifty percent of the Contract price without prior approval from the Owner, Engineer and Agency.

SC-7.07.N - Add paragraph 7.07.N as follows:

N. This Project is being paid with Federal American Recovery Plan Funds, so Contractor is required to have the Federal Contract Provisions, as provided, signed by itself and all subcontractors. A copy of each signed Federal Contract Provisions shall be forwarded to the Owner upon request. Each Subcontractor must provide its UEI (Unique Entity Identifier) number

7.10 *Taxes*

SC-7.10 Add a new paragraph immediately after Paragraph 7.10.A:

B. The following is a list of requirements to be followed by the Contractor in maintaining proper records and reporting the North Carolina Sales and Use Tax and Local Sales and Use Tax. The Contractor shall comply fully with the requirements outlined below, in order that the Owner may recover the amount of the tax permitted under the law.

1 It shall be the Contractors responsibility to furnish the Owner documentary evidence showing the materials used and sales and use tax paid by the Contractor and by each of its Subcontractors. Such evidence shall be transmitted to the Owner with each pay request regardless of whether taxes were paid in that period covered by the pay request.

2 The documentary evidence shall consist of a certified statement by the Contractor and by each of the Contractor's Subcontractors individually, showing total purchases of materials from each separate vendor and total sales and use taxes paid to each vendor. Certified statements must show the invoice number, or numbers, covered, and inclusive dates of such invoices.

3 Materials used from Contractor's or Subcontractor's warehouse stock shall be shown in a certified statement at warehouse stock prices.

ARTICLE 8 -- OTHER WORK AT THE SITE

No suggested Supplementary Conditions in this Article.

ARTICLE 9 -- OWNER'S RESPONSIBILITIES

No suggested Supplementary Conditions in this Article.

ARTICLE 10 -- ENGINEER'S STATUS DURING CONSTRUCTION

10.03 *Resident Project Representative*

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

C. The Resident Project Representative (RPR) will be Engineer's representative at the Site. RPR's dealings in matters pertaining to the Work in general will be with Engineer and Contractor. RPR's dealings with Subcontractors will only be through or with the full knowledge or approval of Contractor. The RPR will:

1. Conferences and Meetings: Attend meetings with Contractor, such as preconstruction conferences, progress meetings, job conferences, and other Project-related meetings (but not including Contractor's safety meetings), and as appropriate prepare and circulate copies of minutes thereof.
2. Safety Compliance: Comply with Site safety programs, as they apply to RPR, and if required to do so by such safety programs, receive safety training specifically related to RPR's own personal safety while at the Site.
3. Liaison
    a. Serve as Engineer's liaison with Contractor. Working principally through Contractor's authorized representative or designee, assist in providing information regarding the provisions and intent of the Contract Documents.
    b. Assist Engineer in serving as Owner's liaison with Contractor when Contractor's operations affect Owner's on-Site operations.
    c. Assist in obtaining from Owner additional details or information, when required for Contractor's proper execution of the Work.
4. Review of Work; Defective Work
    a. Conduct on-Site observations of the Work to assist Engineer in determining, to the extent set forth in Paragraph 10.02, if the Work is in general proceeding in accordance with the Contract Documents.
    b. Observe whether any Work in place appears to be defective.
    c. Observe whether any Work in place should be uncovered for observation, or requires special testing, inspection or approval.
5. Inspections and Tests
    a. Observe Contractor-arranged inspections required by Laws and Regulations, including but not limited to those performed by public or other agencies having jurisdiction over the Work.
    b. Accompany visiting inspectors representing public or other agencies having jurisdiction over the Work.
6. Payment Requests: Review Applications for Payment with Contractor.
7. Completion
    a. Participate in Engineer's visits regarding Substantial Completion.
    b. Assist in the preparation of a punch list of items to be completed or corrected.
    c. Participate in Engineer's visit to the Site in the company of Owner and Contractor regarding completion of the Work, and prepare a final punch list of items to be completed or corrected by Contractor.
    d. Observe whether items on the final punch list have been completed or corrected.
    e. The RPR will not:

1. Authorize any deviation from the Contract Documents or substitution of materials or equipment (including “or-equal” items).
2. Exceed limitations of Engineer’s authority as set forth in the Contract Documents.
3. Undertake any of the responsibilities of Contractor, Subcontractors, or Suppliers.
4. Advise on, issue directions relative to, or assume control over any aspect of the means, methods, techniques, sequences or procedures of construction.
5. Advise on, issue directions regarding, or assume control over security or safety practices, precautions, and programs in connection with the activities or operations of Owner or Contractor.
6. Participate in specialized field or laboratory tests or inspections conducted off-site by others except as specifically authorized by Engineer.
7. Authorize Owner to occupy the Project in whole or in part.

ARTICLE 11 -- CHANGES TO THE CONTRACT

SC-11.09.B - Change Proposal Procedures Replace paragraph 11.09.B.4 with the following:

A Replace paragraph 11.09.B.4 with the following:

4. Engineer's Full Review and Action on the Change Proposal: Upon receipt of Contractor's supporting data (including any additional data requested by Engineer), Engineer will conduct a full review of each Change Proposal and within 30 days after such receipt of the Contractor's supporting data and provide to the Owner a recommendation on the Change Proposal. Such action must be in writing. If Engineer does not take action on the Change Proposal within 30 days, then either the Owner or Contractor may at any time thereafter submit a letter to the other party indicating that as a result of Engineer's inaction the Change Proposal is deemed denied, thereby commencing the time for appeal of the denial under Article 12.

B Delete paragraph 11.09.B.5

ARTICLE 12 -- CLAIMS

SC-12.01.A.1 Replace paragraph 12.01.A.1 with the following:

1. Appeals by the Contractor to Owner's decisions regarding Change Proposals:

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

13.01 *Cost of the Work*

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

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

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

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

ARTICLE 14 -- TESTS AND INSPECTIONS; CORRECTION, REMOVAL, OR ACCCEPTANCE OF DEFECTIVE WORK

No suggested Supplementary Conditions in this Article.

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

15.01 *Progress Payments*

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

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

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

15.03 *Substantial Completion*

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

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

SC-15.03.C - Amend paragraph by striking out the following text:

"or if despite consideration of Owner's objections Engineer concludes that the Work is substantially complete"

ARTICLE 16 -- SUSPENSION OF WORK AND TERMINATION

No suggested Supplementary Conditions in this Article.

ARTICLE 17 -- FINAL RESOLUTIONS OF DISPUTES

SC-17.01.B, Delete Paragraph 17.01.B in its entirety and replace it with the following:

B. Disputes shall be resolved in accordance with the dispute resolution process adopted on February 26, 2002, by the N. C. State Building Commission. The “Rules Implementing Mediated Settlement Conferences in North Carolina Public Construction Projects” are attached to this section.

SC-17.01.C, Delete Paragraph 17.01.C in its entirety and replace it with the following:

C. All parties agree that only the North Carolina courts shall have jurisdiction over the Contract and any controversies arising out of this Contract and this agreement shall be governed by and construed in accordance with the laws of the State of North Carolina.

END OF SECTION

Federal Contract Provisions

This **ADDENDUM** (this "Addendum") is entered into by and between _____ ("Contractor"), and Piedmont Triad Regional Water Authority (PTRWA), a political subdivision of the State of North Carolina, and forms an integral part of the Contract (as defined in Section I hereof).

NOW THEREFORE, Contractor and PTRWA do mutually agree as follows:

AGREEMENTS

I. Definitions

A. Unless otherwise defined in this Addendum, capitalized terms used in this Addendum shall have the meanings ascribed thereto in this Section I.

1. "Administering Agency" shall have the meaning specified in 41 C.F.R. § 60-1.3.

2. "Applicant" shall have the meaning specified in 41 C.F.R. § 60-1.3, which is provided here for ease of reference: ("An applicant for Federal assistance involving a construction contract, or other participant in a program involving a construction contract as determined by regulation of an administering agency. The term also includes such persons after they become recipients of such Federal assistance.").

3. "Construction Work" shall have the meaning specified in 41 C.F.R. § 60-1.3, which is provided here for ease of reference: ("[T]he construction, rehabilitation, alteration, conversion, extension, demolition or repair of buildings, highways, or other changes or improvements to real property, including facilities providing utility services. The term also includes the supervision, inspection, and other onsite functions incidental to the actual construction.").

4. "Contract" shall mean the legal instrument by which the PTRWA, as a Recipient or Subrecipient, shall purchase from Contractor property or services needed to carry out a project or program under a federal award, and of which this Addendum shall constitute an integral part.

5. "Contractor" shall mean the entity named as "Contractor" in this Addendum that has received a Contract from the PTRWA.

6. "Federally Assisted Construction Contract" shall have the meaning specified in 41 C.F.R. § 60-1.3, which is provided here for ease of reference: ("[A]ny agreement or modification thereof between any applicant and a person for construction work which is paid for in whole or in part with funds obtained from the Government or borrowed on the credit of the Government pursuant to any federal program involving a grant, contract, loan, insurance, or guarantee, or undertaken pursuant to any federal program involving such grant, contract, loan, insurance, or guarantee, or any application or modification thereof approved by the government of the United States of America for a grant, contract, loan, insurance, or guarantee under which the applicant itself participates in the construction work.").

7. "Government" shall have the meaning specified in 41 C.F.R. § 60-1.3, which is provided here for ease of reference: ("[T]he government of the United States of America.").

8. "Laborer" or "Mechanic" shall have the meaning specified in 29 C.F.R. § 5.2(m), which is provided here for ease of reference: ("The term *laborer* or *mechanic* includes at least those workers whose duties are manual or physical in nature (including those workers who use tools or who are performing the work of a trade), as distinguished from mental or managerial. The term *laborer* or *mechanic* includes apprentices, trainees, helpers, and, in the case of contracts subject to the Contract Work Hours and Safety Standards Act, watchmen or guards. The term does not apply to workers whose duties are primarily administrative, executive, or clerical, rather than manual. Persons employed in a bona fide executive, administrative, or professional capacity as defined in part 541 of [Title 40 of the United States Code] are not deemed to be laborers or mechanics. Working foremen who devote more than 20 percent of their time during a workweek to mechanic or laborer duties, and who do not meet the criteria of [Title 40 of the United States Code], are laborers and mechanics for the time so spent.").

9. "Recipient" shall mean an entity that receives a federal award directly from a federal awarding agency. The term does not include subrecipients or individuals that are beneficiaries of an award.

10. "Subcontract" shall mean any agreement entered into by a Subcontractor to furnish supplies or services for the performance of this Contract or a Subcontract. It includes, but is not limited to, purchase orders and changes and modifications to purchase orders.

11. "Subcontractor" shall mean an entity that receives a Subcontract.

12. "Subrecipient" shall mean an entity that receives a subaward from a pass-through entity to carry out part of a federal award; but it does not include an individual that is a beneficiary of such award. A subrecipient may also be a recipient of other federal awards directly from a federal awarding agency.

13. "Tier" shall have the meaning indicated in 2 C.F.R. Part 180 and illustrated in 2 C.F.R. Part 180, Appendix II.

14. "PTRWA" shall have the meaning indicated in the preamble to this Addendum.

II. Equal Employment Opportunity

A. If this contract is a Federally Assisted Construction Contract exceeding $10,000, during the performance of this Contract, Contractor agrees as follows:

1. Contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, sexual orientation, gender identity, or national origin. Contractor will take affirmative action to ensure that applicants are employed and that employees are treated during employment without regard to their race, color, religion, sex, sexual orientation, gender identity, or national origin. Such action shall include, but not be limited to, the following: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. Contractor agrees to post in conspicuous places, available to

employees and applicants for employment, notices to be provided setting forth the provisions of this nondiscrimination clause.

2. Contractor will, in all solicitations or advertisements for employees placed by or on behalf of Contractor, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, sexual orientation, gender identity, or national origin.

3. Contractor will not discharge or in any other manner discriminate against any employee or applicant for employment because such employee or applicant has inquired about, discussed, or disclosed the compensation of the employee or applicant or another employee or applicant. This provision shall not apply to instances in which an employee who has access to the compensation information of other employees or applicants as a part of such employee's essential job functions discloses the compensation of such other employees or applicants to individuals who do not otherwise have access to such information, unless such disclosure is in response to a formal complaint or charge, in furtherance of an investigation, proceeding, hearing, or action, including an investigation conducted by the employer, or is consistent with Contractor's legal duty to furnish information.

4. Contractor will send to each labor union or representative of workers with which it has a collective bargaining agreement or other contract or understanding, a notice to be provided advising the said labor union or workers' representatives of Contractor's commitments under this section, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.

5. Contractor will comply with all provisions of Executive Order 11246 of September 24, 1965, and of the rules, regulations, and relevant orders of the Secretary of Labor.

6. Contractor will furnish to the Administering Agency and the Secretary of Labor all information and reports required by Executive Order 11246 of September 24, 1965, and by rules, regulations, and orders of the Secretary of Labor, or pursuant thereto, and will permit access to its books, records, and accounts by the Administering Agency and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.

7. In the event of Contractor's noncompliance with the nondiscrimination clauses of this Contract or with any of the said rules, regulations, or orders, this Contract may be canceled, terminated, or suspended, in whole or in part, and Contractor may be declared ineligible for further Government contracts or Federally Assisted Construction Contracts in accordance with procedures authorized in Executive Order 11246 of September 24, 1965. Such other sanctions may be imposed and remedies invoked as provided in Executive Order 11246 of September 24, 1965, or by rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law.

8. Contractor will include the portion of the sentence immediately preceding paragraph A.1. of this Section II and the provisions of paragraphs A.1. through A.7. in every Subcontract or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to section 204 of Executive Order 11246 of September 24, 1965, so that such provisions will be binding upon each Subcontractor or vendor. Contractor will take such action

with respect to any Subcontract or purchase order as the Administering Agency may direct as a means of enforcing such provisions, including sanctions for noncompliance.

Provided, however, that in the event Contractor becomes involved in, or is threatened with, litigation with a Subcontractor or vendor as a result of such direction by the Administering Agency, Contractor may request the United States to enter into such litigation to protect the interests of the United States.

PTRWA further agrees that it will be bound by the above equal opportunity clause with respect to its own employment practices when it participates in federally assisted construction work. Provided, that if PTRWA so participating is a State or local government, the above equal opportunity clause is not applicable to any agency, instrumentality, or subdivision of such government which does not participate in work on or under the Contract.

9. PTRWA agrees that it will assist and cooperate actively with the Administering Agency and the Secretary of Labor in obtaining the compliance of Contractor and any Subcontractors with the equal opportunity clause and the rules, regulations, and relevant orders of the Secretary of Labor; that it will furnish the Administering Agency and the Secretary of Labor such information as they may require for the supervision of such compliance; and that it will otherwise assist the Administering Agency in the discharge of the agency's primary responsibility for securing compliance.

10. PTRWA further agrees that it will refrain from entering into any contract or contract modification subject to Executive Order 11246 of September 24, 1965, with a contractor debarred from, or who has not demonstrated eligibility for, Government contracts and Federally Assisted Construction Contracts pursuant to the Executive Order and that it will carry out such sanctions and penalties for violation of the equal opportunity clause as may be imposed upon Contractor and any Subcontractors by the Administering Agency or the Secretary of Labor pursuant to Part II, Subpart D of the Executive Order. In addition, PTRWA agrees that if it fails or refuses to comply with these undertakings, the Administering Agency may take any or all of the following actions: Cancel, terminate, or suspend, in whole or in part, this grant (contract, loan, insurance, guarantee); refrain from extending any further assistance to the applicant under the program with respect to which the failure or refund occurred until satisfactory assurance of future compliance has been received from such applicant; and refer the case to the Department of Justice for appropriate legal proceedings.

B. If this Contract is not a Federally Assisted Construction Contract exceeding $10,000, the provisions of Section I.A. of this Addendum shall not apply.

III. Copeland "Anti-Kickback" Act

A. Contractor and any Subcontractors performing work under the Contract shall comply with 18 U.S.C. § 874. PTRWA shall report all suspected or reported violations to Treasury.

IV. Contract Work Hours and Safety Standards Act

A. *Overtime Requirements.* No Contractor or Subcontractor contracting for any part of the Contract work which may require or involve the employment of Laborers or Mechanics shall require or permit any such Laborer or Mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such Laborer or Mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek.

B. *Violation; Liability for Unpaid Wages; Liquidated Damages*. In the event of any violation of the clause set forth in Section IV.A. (*Overtime Requirements*), above, Contractor and any Subcontractor responsible therefor shall be liable for the unpaid wages. In addition, such Contractor and Subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory) for liquidated damages. Such liquidated damages shall be computed with respect to each individual Laborer or Mechanic, including watchmen and guards, employed in violation of the clause set forth in Section IV.A. (*Overtime Requirements*), above, in the sum of $27 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in Section IV.A. (*Overtime Requirements*), above.

C. *Withholding for Unpaid Wages and Liquidated Damages*. PTRWA shall, upon its own action or upon written request of an authorized representative of the Department of Labor, withhold, or cause to be withheld, from any moneys payable on account of work performed by Contractor or Subcontractor under any such contract or any other federal contract with the same prime contractor, or any other federally assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of Contractor or Subcontractor for unpaid wages and liquidated damages as provided in Section IV.B. (*Violation; Liability for Unpaid Wages; Liquidated Damage*s) of this section.

D. *Subcontracts*. Contractor or Subcontractor shall insert in any Subcontract the clauses set forth in Sections IV.A. through IV.D. and also a clause requiring Subcontractors to include these clauses in any lower-Tier Subcontracts. Contractor shall be responsible for compliance by any first-Tier Subcontractor or lower-Tier Subcontractor with the clauses set forth in Sections IV.A. through IV.D.

E. *Payroll and Records*. Contractor or Subcontractor shall maintain payrolls and basic payroll records during the course of the work and shall preserve them for a period of three years from the completion of the Contract for all Laborers and Mechanics, including guards and watchmen, working on the Contract. Such records shall contain the name and address of each such employee, Social Security number, correct classifications, hourly rates of wages paid, daily and weekly number of hours worked, deductions made, and actual wages paid. Records to be maintained under this provision shall be made available by Contractor or Subcontractor for inspection, copying, or transcription by authorized representatives of the Department of the Treasury and the Department

of Labor, and Contractor or Subcontractor will permit such representatives to interview employees during working hours on the job.

F. *Exceptions*. None of the requirements of Section IV of this Addendum shall apply if this Contract is a Contract (1) for transportation by land, air, or water; (2) for the transmission of intelligence; (3) for the purchase of supplies, materials, or articles ordinarily available in the open market; or (4) in an amount that is equal to or less than $100,000.

V. Rights to Inventions Made Under a Contract or Agreement

A. The Government reserves a royalty-free, non-exclusive and irrevocable license to reproduce, publish, or otherwise use, and to authorize others to use for "Government purposes," any subject data or copyright described below. "Government purposes" means use only for the direct purposes of the Government. Without the copyright owner's consent, the Government may not extend its federal license to any other party.

1. Any subject data developed under the Contract, whether or not a copyright has been obtained, and

2. Any rights of copyright purchased by Contractor using federal assistance funded in whole or in part by the Department of the Treasury.

B. Unless Treasury determines otherwise, a Contractor performing experimental, developmental, or research work required as part of this Contract agrees to permit Treasury to make available to the public either (1) Treasury's license in the copyright to any subject data developed in the course of the Contract or (2) a copy of the subject data first produced under the Contract for which a copyright has not been obtained. If the experimental, developmental, or research work which is the subject of this Contract is not completed for any reason whatsoever, all data developed under the Contract shall become subject data as defined herein and shall be delivered as the Government may direct.

C. Unless prohibited by North Carolina law, upon request by the Government, Contractor agrees to indemnify, save, and hold harmless the Government, its officers, agents, and employees acting within the scope of their official duties against any liability, including costs and expenses, resulting from any willful or intentional violation by Contractor of proprietary rights, copyrights, or right of privacy arising out of the publication, translation, reproduction, delivery, use, or disposition of any data furnished under the Contract. Contractor shall be required to indemnify the Government for any such liability arising out of the wrongful act of any employee, official, or agent of the Contractor.

D. Nothing contained in this clause shall imply a license to the Government under any patent or be construed as affecting the scope of any license or other right otherwise granted to the Government under any patent.

E. Data developed by Contractor and financed entirely without using federal assistance provided by the Government that has been incorporated into work required by the underlying Contract is exempt from the requirements herein, provided that Contractor identifies those data in writing at the time of delivery of the Contract work. Contractor agrees to include these requirements in each

Subcontract for experimental, developmental, or research work financed in whole or in part with federal assistance.

F. For the purposes of this Section V, "subject data" means "recorded information, whether or not copyrighted, . . . that is delivered or specified to be delivered as required by the Contract." Examples of "subject data" include, but are not limited to, "computer software, standards, specifications, engineering drawings and associated lists, process sheets, manuals, technical reports, catalog item identifications, and related information, but do not include financial reports, cost analyses or other similar information used for performance or administration of the Contract.

VI. Clean Air Act and Federal Water Pollution Control Act

A. *Clean Air Act*. Contractor agrees to comply with all applicable standards, orders, and regulations issued pursuant to the Clean Air Act, as amended, 42 U.S.C. §§ 7401 *et seq.* Contractor agrees to report each violation to PTRWA and understands and agrees that PTRWA will, in turn, report each violation as required to Treasury and the appropriate Environmental Protection Agency Regional Office. Contractor agrees to include these requirements in each Subcontract exceeding $150,000 financed, in whole or in part, with federal assistance provided by Treasury.

B. *Federal Water Pollution Control Act.* Contractor agrees to comply with all applicable standards, orders, and regulations issued pursuant to the Federal Water Pollution Control Act, as amended, 33 U.S.C. §§ 1251 *et seq.* Contractor agrees to report each violation to PTRWA and understands and agrees that PTRWA will, in turn, report each violation as required to assure notification to Treasury and the appropriate Environmental Protection Agency Regional Office. Contractor agrees to include these requirements in each Subcontract exceeding $150,000 financed, in whole or in part, with federal assistance provided by Treasury.

VII. Debarment and Suspension

A. Due to its receipt of Fiscal Recovery Funds, PTRWA is a participant in a nonprocurement transaction (defined at 2 C.F.R. § 180.970) that is a covered transaction pursuant to 2 C.F.R. § 180.210 and 31 C.F.R. § 19.210. Therefore, this Contract is a lower-Tier covered transaction for purposes of 2 C.F.R. Part 180 and 31 C.F.R. Part 19 if (1) the amount of this Contract is greater than or equal to $25,000 (2 C.F.R. § 180.220(b)(1); 31 C.F.R. § 19.220(b)(1)); (2) the Contract requires the consent of an official of the Department of the Treasury (2 C.F.R. § 180.220(b)(2); 31 C.F.R. § 19.220(b)(2)); or (3) this Contract is for federally required audit services (2 C.F.R. § 180.220(b)(3); 31 C.F.R. § 19.220(b)(3)).

B. If this Contract is a covered transaction as set forth in Section VII.A., above, Contractor hereby certifies as of the date hereof that Contractor, Contractor's principals (defined at 2 C.F.R. § 180.995), and the affiliates (defined at 2 C.F.R. § 180.905) of both Contractor and Contractor's principals are not excluded (defined at 2 C.F.R. § 180.940) and are not disqualified (defined at 2 C.F.R. § 180.935). If any of the foregoing persons are excluded or disqualified and the Secretary of the Treasury has not granted an exception pursuant to 31 C.F.R. § 19.120(a), (1) this Contract

shall be void, (2) PTRWA shall not make any payments of federal financial assistance to Contractor, and (3) PTRWA shall have no obligations to Contractor under this Contract.

C. Contractor must comply with 2 C.F.R. Part 180, Subpart C and 31 C.F.R. Part 19 and must include a requirement to comply with these regulations in any lower-Tier covered transaction into which it enters. This certification is a material representation of fact relied upon by PTRWA, and all liability arising from an erroneous representation shall be borne solely by Contractor.

D. If it is later determined that Contractor did not comply with 2 C.F.R. Part 180, Subpart C and 31 C.F.R. Part 19, in addition to remedies available to PTRWA, the Government may pursue available remedies, including but not limited to suspension and/or debarment.

VIII. Byrd Anti-Lobbying Amendment

A. Contractor certifies to PTRWA, and Contractor shall cause each Tier below it to certify to the Tier directly above such Tier, that it has not used and will not use federally appropriated funds to pay any person or organization for influencing or attempting to influence an officer or employee of any agency, a member of Congress, officer or employee of Congress, or an employee of a member of Congress in connection with obtaining any federal contract, grant, or any other award covered by 31 U.S.C. § 1352. Contractor shall, and shall cause each Tier below it, to disclose any lobbying with non–federally appropriated funds that takes place in connection with obtaining any federal award. Such disclosures (to be set forth on Standard Form-LLL, contained in 31 C.F.R. Part 21, Appendix B) shall be forwarded from Tier to Tier up to the PTRWA, which will, in turn, forward the certification(s) to Treasury. Contractor shall cause the language of this Section VIII.A. to be included in all Subcontracts. This certification is a material representation of fact upon which PTRWA has relied when entering into this Contract, and all liability arising from an erroneous representation shall be borne solely by Contractor.

B. Contractors that bid or apply for a contract exceeding $100,000 (including this Contract, if applicable) also must file with PTRWA the certification in Attachment 1 to this Addendum, which is attached hereto and incorporated herein.

C. Contractor also shall cause any Subcontractor with a Subcontract (at any Tier) exceeding $100,000 to file with the Tier above it the certification in Attachment 1 to this Addendum, which is attached hereto and incorporated herein.

IX. Procurement of Recovered Materials

A. This Section shall apply if (1) this Contract involves the purchase of an item designated by the Environmental Protection Agency ("EPA") in 40 C.F.R. Part 247 that exceeds $10,000 or (2) the total value of such designated items acquired during PTRWA's preceding fiscal year exceeded $10,000.

B. In the performance of the Contract, Contractor shall make maximum use of products containing recovered materials that are EPA-designated items, unless the product cannot (1) be acquired competitively within a timeframe providing for compliance with the Contract performance

schedule, (2) meet Contract performance requirements, or (3) be acquired at a reasonable price. Information about this requirement, along with the list of EPA-designated items, is available on EPA's website. Contractor also agrees to comply with all other applicable requirements of Section 6002 of the Solid Waste Disposal Act.

X. Prohibition on Contracting for Covered Telecommunications Equipment or Services

A. *Definitions*. Unless otherwise defined in this Contract, capitalized terms used in this Section X shall have the meanings ascribed thereto in this Section X.A.

1. "Backhaul" means intermediate links between the core network, or backbone network, and the small subnetworks at the edge of the network (e.g., connecting cell phones/towers to the core telephone network). Backhaul can be wireless (e.g., microwave) or wired (e.g., fiber optic, coaxial cable, Ethernet).

2. "Covered Foreign Country" means the People's Republic of China.

3. "Covered Telecommunications Equipment or Services" means (a) telecommunications equipment produced by Huawei Technologies Company or ZTE Corporation (or any subsidiary or affiliate of such entities); (b) for the purpose of public safety, security of Government facilities, physical security surveillance of critical infrastructure, and other national security purposes, video surveillance and telecommunications equipment produced by Hytera Communications Corporation, Hangzhou Hikvision Digital Technology Company, or Dahua Technology Company (or any subsidiary or affiliate of such entities); (c) telecommunications or video surveillance services provided by such entities or using such equipment; or (d) telecommunications or video surveillance equipment or services produced or provided by an entity that the Secretary of Defense, in consultation with the Director of National Intelligence or the Director of the Federal Bureau of Investigation, reasonably believes to be an entity owned or controlled by, or otherwise connected to, the government of a Covered Foreign Country.

4. "Critical Technology" means (1) defense articles or defense services included on the United States Munitions List set forth in the International Traffic in Arms Regulations under subchapter M of chapter I of title 22, Code of Federal Regulations; (2) items included on the Commerce Control List set forth in Supplement No. 1 to part 774 of the Export Administration Regulations under subchapter C of chapter VII of title 15, Code of Federal Regulations and controlled (a) pursuant to multilateral regimes, including for reasons relating to national security, chemical and biological weapons proliferation, nuclear nonproliferation, or missile technology, or (b) for reasons relating to regional stability or surreptitious listening; (3) specially designed and prepared nuclear equipment, parts and components, materials, software, and technology covered by part 810 of title 10, Code of Federal Regulations (relating to assistance to foreign atomic energy activities); (4) nuclear facilities, equipment, and material covered by part 110 of title 10, Code of Federal Regulations (relating to export and import of nuclear equipment and material); (5) select agents and toxins covered by part 331 of title 7, Code of Federal Regulations; part 121 of title 9 of such Code; or part 73 of title 42 of such Code; or (6) emerging and foundational technologies controlled pursuant to section 1758 of the Export Control Reform Act of 2018 (50 U.S.C. § 4817).

5. "Interconnection Arrangements" means arrangements governing the physical connection of two or more networks to allow the use of another's network to hand off traffic where it is ultimately delivered (e.g., connection of a customer of telephone provider A to a customer of telephone company B) or sharing data and other information resources.

6. "Roaming" means cellular communications services (e.g., voice, video, data) received from a visited network when unable to connect to the facilities of the home network either because signal coverage is too weak or because traffic is too high.

7. "Substantial or Essential Component" means any component necessary for the proper function or performance of a piece of equipment, system, or service.

8. "Telecommunications Equipment or Services" means telecommunications or video surveillance equipment or services, such as, but not limited to, mobile phones, land lines, internet, video surveillance, and cloud services.

B. Prohibitions.

1. Section 889(b) of the John S. McCain National Defense Authorization Act for Fiscal Year 2019, Pub. L. No. 115-232, and 2 C.F.R. § 200.216 prohibit the head of an executive agency on or after August 13, 2020, from obtaining or expending grant, cooperative agreement, loan, or loan guarantee funds on certain telecommunications products or from certain entities for national security reasons.

2. Unless an exception in Section X.C. applies, Contractor and any Subcontractors may not use grant, cooperative agreement, loan, or loan guarantee funds (including, without limitation, Fiscal Recovery Funds) received from a federal government to:

   a. Procure or obtain any equipment, system, or service that uses Covered Telecommunications Equipment or Services as a Substantial or Essential Component of any system or as Critical Technology of any system;

   b. Enter into, extend, or renew a contract to procure or obtain any equipment, system, or service that uses Covered Telecommunications Equipment or Services as a Substantial or Essential Component of any system or as Critical Technology of any system;

   c. Enter into, extend, or renew contracts with entities that use Covered Telecommunications Equipment or Services as a Substantial or Essential Component of any system or as Critical Technology as part of any system; or

   d. Provide, as part of its performance of this Contract, any Subcontract; any other contractual instrument; or any equipment, system, or service that uses Covered Telecommunications Equipment or Services as a Substantial or Essential Component of any system or as Critical Technology as part of any system.

C. Exceptions.

1. This clause does not prohibit Contractor or Subcontractors from providing:

a. A service that connects to the facilities of a third party, such as Backhaul, Roaming, or Interconnection Agreements, or

b. Telecommunications equipment that cannot route or redirect user data traffic or permit visibility into any user data or packets that such equipment transmits or otherwise handles.

2. By necessary implication and regulation, the prohibitions also do not apply to:

a. Covered telecommunications equipment that:

i. Is not used as a Substantial or Essential Component of any system and

ii. Is not used as Critical Technology of any system.

b. Other telecommunications equipment or services that are not considered Covered Telecommunications Equipment or Services.

D. Reporting Requirement

1. In the event Contractor identifies, during contract performance, covered Telecommunications Equipment or Services used as a Substantial or Essential Component of any system or as Critical Technology as part of any system, or if Contractor is notified of such by a Subcontractor at any Tier or by any other source, Contractor shall report the information in paragraph D.2(d)(2) of this Section X to PTRWA, unless procedures for reporting the information are established elsewhere in this Contract.

2. Contractor shall report the following information to PTRWA pursuant to paragraph D.1 of this Section X:

a. Within one business day from the date of such identification or notification: contract number; order number(s), if applicable; supplier name; supplier unique entity identifier (if known); supplier Commercial and Government Entity (CAGE) code (if known); brand; model number (original equipment manufacturer number, manufacturer part number, or wholesaler number); item description; and any readily available information about mitigation actions undertaken or recommended.

b. Within ten business days of submitting the information in paragraph D.2.a. of this Section: any further available information about mitigation actions undertaken or recommended. In addition, Contractor shall describe (i) the efforts it undertook to prevent use or submission of Covered Telecommunications Equipment or Services and (ii) any additional efforts that will be incorporated to prevent future use or submission of Covered Telecommunications Equipment or Services.

E. *Subcontractor*. Contractor shall cause to be inserted into all Subcontracts and other contractual instruments relating to the performance of this Contract the substance of this Section X, including this paragraph E.

XI. Domestic Preferences for Procurements

A. For purposes of this Section XI, the terms below are defined as follows:

1. "Produced in the United States" means, for iron and steel products, that all manufacturing processes, from the initial melting stage through the application of coating, occurred in the United States.

2. "Manufactured Products" means items and construction materials composed, in whole or in part, of non-ferrous metals such as aluminum; plastics and polymer-based products such as polyvinyl chloride pipe; aggregates such as concrete; glass, including optical fiber; and lumber.

B. As applicable, and to the extent consistent with law, Contractor should, to the greatest extent practicable, provide a preference for the purchase, acquisition, or use of goods, products or materials Produced in the United States. This includes, but is not limited to, iron, aluminum, steel, cement, and other Manufactured Products. Contractor shall cause any Subcontractors to include the requirements of this Section XI in any Subcontracts.

XII. Solicitation of Minority and Women-Owned Business Enterprises

A. If Contractor intends to let any Subcontracts, Contractor shall (1) place qualified small and minority businesses and women's business enterprises on its solicitation lists; (2) assure that small and minority businesses and women's business enterprises are solicited whenever they are potential sources; (3) divide total requirements, when economically feasible, into smaller tasks or quantities to permit maximum participation by small and minority businesses, veterans businesses, and women's business enterprises; (4) establish delivery schedules, where the requirement permits, which encourage participation by small and minority businesses and women's business enterprises; (5) use the services and assistance, as appropriate, of the Small Business Administration, the Minority Business Development Agency of the Department of Commerce, and the North Carolina Office for Historically Underutilized Businesses.

B. For the purposes of Section XII.A., an entity shall qualify (1) as a "minority business" or "women's business enterprise" if it is currently certified as a North Carolina "historically underutilized business" under Chapter 143, Section 128.4(a) of the N.C. General Statutes (hereinafter G.S.), and (2) as a "small business" if it is independently owned and operated and is qualified under the Small Business Administration criteria and size standards at 13 C.F.R. Part 21.

XIII. Access to Records

A. Contractor agrees to provide PTRWA, the Department of the Treasury, the Treasury Office of Inspector General, the Government Accountability Office, and the Comptroller General of the United States, or any authorized representatives of these entities, access to any records (electronic and otherwise) of Contractor which are directly pertinent to this Contract to conduct audits or any

other investigations. Contractor agrees to permit any of the foregoing parties to reproduce such records by any means whatsoever or to copy excerpts and transcriptions as reasonably needed.

B. Contractor agrees to retain all records covered by this Section XIII through December 31, 2031, or such longer period as is necessary for the resolution of any litigation, claim, negotiation, audit, or other inquiry involving the Contract.

XIV. Conflicts of Interest; Gifts and Favors

A. Contractor understands that (1) PTRWA will use Fiscal Recovery Funds to pay for the cost of this Contract and (2) the expenditure of Fiscal Recovery Funds is governed by the Conflict of Interest Policy of the PTRWA, the Regulatory Requirements (including, without limitation, 2 C.F.R. § 200.318(c)(1)), and North Carolina law (including, without limitation, G.S. 14-234(a)(1) and -234.3(a)).

B. Contractor certifies to PTRWA that as of the date hereof, to the best of its knowledge after reasonable inquiry, no employee, officer, or agent of PTRWA involved in the selection, award, or administration of this Contract (each a "Covered Individual"); no member of a Covered Individual's immediate family; no partner of a Covered Individual; and no organization (including Contractor) which employs or is about to employ a Covered Individual has a financial or other interest in, or has received a tangible personal benefit from, Contractor. Should Contractor obtain knowledge of any such interest or any tangible personal benefit described in the preceding sentence after the date hereof, Contractor shall promptly disclose the same to PTRWA in writing.

C. Contractor certifies to PTRWA that it has not provided, nor offered to provide, any gratuities, favors, or anything of value to an officer, employee, or agent of PTRWA. Should Contractor obtain knowledge of the provision, or offer of any provision, of any gratuity, favor, or anything of value to an officer, employee, or agent described in the preceding sentence after the date hereof, Contractor shall promptly disclose the same to PTRWA in writing.

XV. Assurances of Compliance with Title VI of the Civil Rights Act of 1964

A. Contractor and any Subcontractor, or the successor, transferee, or assignee of Contractor or any Subcontractor, shall comply with Title VI of the Civil Rights Act of 1964, which prohibits recipients of federal financial assistance from excluding from a program or activity, denying benefits of, or otherwise discriminating against a person on the basis of race, color, or national origin (42 U.S.C. §§ 2000d *et seq*.), as implemented by the Department of the Treasury's Title VI regulations, 31 C.F.R. Part 22, which are herein incorporated by reference and made a part of this Contract. Title VI also provides protection to persons with "Limited English Proficiency" in any program or activity receiving federal financial assistance, 42 U.S.C. §§ 2000d *et seq*., as implemented by Treasury's Title VI regulations, 31 C.F.R. Part 22, and herein incorporated by reference and made a part of this Contract.

XVI. Other Non-Discrimination Statutes

A. Contractor acknowledges that PTRWA is bound by and agrees, to the extent applicable to Contractor, to abide by the provisions contained in the federal statutes enumerated below and any other federal statutes and regulations that may be applicable to the expenditure of Fiscal Recovery Funds:

1. The Fair Housing Act, Title VIII of the Civil Rights Act of 1968 (42 U.S.C. §§ 3601 *et seq*.), which prohibits discrimination in housing on the basis of race, color, religion, national origin, sex, familial status, or disability;

2. Section 504 of the Rehabilitation Act of 1973, as amended (29 U.S.C. § 794), which prohibits discrimination on the basis of disability under any program or activity receiving federal financial assistance;

3. The Age Discrimination Act of 1975, as amended (42 U.S.C. §§ 6101 *et seq*.), and Treasury's implementing regulations at 31 C.F.R. Part 23, which prohibit discrimination on the basis of age in programs or activities receiving federal financial assistance; and

4. Title II of the Americans with Disabilities Act of 1990, as amended (42 U.S.C. §§ 12101 *et seq*.), which prohibits discrimination on the basis of disability in programs, activities, and services provided or made available by state and local governments or instrumentalities or agencies thereto.

XVII. Miscellaneous

A. *Increasing Seat Belt Use in the United States*. Pursuant to Executive Order 13043, 62 Fed. Reg. 19,216 (Apr. 18, 1997), PTRWA encourages Contractor to adopt and enforce on-the-job seat belt policies and programs for its employees when operating company-owned, rented, or personally owned vehicles.

B. *Reducing Text Messaging While Driving*. Pursuant to Executive Order 13513, 74 Fed. Reg. 51,225 (Oct. 6, 2009), PTRWA encourages Contractor to adopt and enforce policies that ban text messaging while driving.

XVIII. Conflicts and Interpretation

A. To the extent that any portion of this Addendum conflicts with any term or condition of this Contract expressed outside of this Addendum, the terms of this Addendum shall govern.

[*Remainder of Page Intentionally Left Blank*]

CONTRACTOR:

By: _____

Name: _____

Title: _____

PTRWA:

By: _____

Name: _____

Title: _____

ATTACHMENT 1
TO
FEDERAL CONTRACT PROVISIONS
APPENDIX A, 31 C.F.R. PART 21 – CERTIFICATION REGARDING LOBBYING

The undersigned certifies, to the best of the undersigned's knowledge and belief, that:

1. No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of an agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, or the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

2. If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

3. The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly.

4. This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by Section 1352, Title 31 of the U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure.

The Contractor, _____, certifies and affirms the truthfulness and accuracy of each statement of its certification and disclosure, if any. In addition, the Contractor understands and agrees that the provisions of 31 U.S.C. Chapter 38, Administrative Remedies for False Claims and Statements, apply to this certification and disclosure, if any.

_____
Signature of Contractor's Authorized Official

_____
Name and Title of Contractor's Authorized Official

_____
Date

RULES IMPLEMENTING MEDIATED SETTLEMENT CONFERENCES IN NORTH CAROLINA PUBLIC CONSTRUCTION PROJECTS

Adopted
February 26, 2002

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RULE 1. INITIATING MEDIATED SETTLEMENT CONFERENCES

A. **Purpose of Mandatory Settlement Conferences**. Pursuant to G.S. 143-128(g) 143-135.26(11), these Rules are promulgated to implement a system of settlement events which are designated to focus the parties' attention on settlement rather than on claim preparation and to provide a structured opportunity for settlement negotiations to take place. Nothing herein is intended to limit or prevent the parties from engaging in settlement procedures voluntarily at any time prior to or during commencement of the dispute resolution process.

B. **Initiating the Dispute Resolution Process**

1) Any party to a public construction contract governed by Article 8. Ch. 143 of the General Statutes and identified in G.S. 143-128(g) and who is a party to a dispute arising out of the construction process in which the amount in controversy is at least $15,000 may submit a written request to the public owner for mediation of the dispute.
2) Prior to submission of a written request for mediation to the public owner, the parties requesting mediation,
    a) If a prime contractor, must have first submitted its claim to the Project Designer for review as set forth in Exhibit A. If the dispute is not resolved through the Project Designer's instructions, then the dispute becomes ripe for mediation in the Formal Dispute Resolution Process, and the party may submit his written request for mediation to the public owner.
    b) If the party requesting mediation is a subcontractor, it must first have submitted its claim for mediation to the prime contractor with whom it has a contract. If the dispute is not resolved through the Prime Contractor's involvement, then the dispute becomes ripe for mediation in the Formal Dispute Resolution Process, and the party may submit its written request for mediation to the public owner.
    c) If the party requesting mediation is the Project Designer, then it must first submit its claim to the public owner to resolve. If the dispute is not resolved with the public owner's involvement, then the Project Designers' dispute is ripe for mediation in the Formal Dispute Resolution Process, and the Project Designer may submit its written request to the public owner for mediation.

RULE 2. SELECTION OF MEDIATOR

A. **Selection of Certified Mediator by Agreement of the Parties**. The parties may select a mediator certified pursuant to the Rules by agreement within 21 days of requesting mediation. The requesting party shall file with the State Construction Office (hereinafter collectively referred to as the "SCO") or public owner if a non-State project a Notice of Selection of Mediator by Agreement within 10 days of the request; however, any party may file the notice. Such notice shall state the name, address and telephone number of the mediator selected; state the rate of compensation of the mediator; state that the mediator and opposing counsel have agreed upon the selection and rate of compensation; and state that the mediator is certified pursuant to these Rules.

B. **Nomination and Public Owner Approval of a Non-Certified Mediator.** The parties may select a mediator who does not meet the certification requirements of these rules but who, in the opinion of the parties and the SCO or public owner, is otherwise qualified by training or experience to mediate the action.

If the parties select a non-certified mediator, the requesting party shall file with the SCO a Nomination of Non-Certified Mediator within 10 days of the request. Such nomination shall state the name, address and telephone number of the mediator; state the training, experience or other qualifications of the mediator; state the rate of compensation of the mediator; and state that the mediator and opposing counsel have agreed upon the selection and rate of compensation.

The SCO or public owner shall rule on said nomination, shall approve or disapprove of the parties' nomination and shall notify the parties of its decision.

C. **Appointment of Mediator by the SCO**. If the parties cannot agree upon the selection of a mediator, the party or party's attorney shall so notify the SCO or public owner and request, on behalf of the parties, that the SCO or public owner appoint a mediator. The request for appointment must be filed within 10 days after request to mediate and shall state that the parties have had a full and frank discussion concerning the selection of a mediator and have been unable to agree. The request shall state whether any party prefers a certified attorney mediator, and if so, the SCO or public owner shall appoint a certified attorney mediator. If no preference is expressed, the SCO or public owner may appoint a certified attorney mediator or a certified non-attorney mediator.

D. **Mediator Information Directory**. To assist the parties in the selection of a mediator by agreement, the parties are free to utilize the list of certified mediators maintained in any county participating in the Superior Court Mediation Settlement Conference Program.

E. **Disqualification of Mediator**. Any party may request replacement of the mediator by the SCO or public owner for good cause. Nothing in this provision shall preclude mediators from disqualifying themselves.

RULE 3. THE MEDIATED SETTLEMENT CONFERENCE

A. **Where Conference is to be Held**. Unless all parties and the mediator otherwise agree, the mediated settlement conference shall be held in the county where the project is located. The mediator shall be responsible for reserving a place and making arrangements for the conference and for giving timely notice of the time and location of the conference to all attorneys, unrepresented parties and other persons and entities required to attend.

B. **When Conference is to be Held**. The deadline for completion of the mediation shall be not less than 30 days nor more than 60 days after the naming of the mediator.

C. **Request to Extend Deadline for Completion**. A party, or the mediator, may request the SCO or public owner to extend the deadline for completion of the conference. Such request shall state the reasons the extension is sought and

shall be served by the moving party upon the other parties and the mediator. If any party does not consent to the request, said party shall promptly communicate its objection to the SCO or public owner.

The SCO or public owner may grant the request by setting a new deadline for completion of the conference.

D. **Recesses.** The mediator may recess the conference at any time and may set times for reconvening. If the time for reconvening is set before the conference is recessed, no further notification is required for persons present at the conference.

E. **The mediated settlement conference shall not be cause for the delay of the construction project which is the focus of the dispute.**

RULE 4. DUTIES OF PARTIES AND OTHER PARTICIPANTS IN FORMAL DISPUTE RESOLUTION PROCESS

A. **Attendance.**
1) All parties to the dispute originally presented to the Designer or Prime Contractor for initial resolution must attend the mediation. Failure of a party to a construction contract to attend the mediation will result in the public owner's withholding of monthly payment to that party until such party attends the mediation.
2) Attendance shall constitute physical attendance, not by telephone or other electronic means. Any attendee on behalf of a party must have authority from that party to bind it to any agreement reached as a result of the mediation.
3) Attorneys on behalf of parties may attend the mediation but are not required to do so.
4) Sureties or insurance company representatives are not required to attend the mediation unless any monies paid or to be paid as a result of any agreement reached as a result of mediation require their presence or acquiescence. If such agreement or presence is required, then authorized representatives of the surety or insurance company must attend the mediation.

B. **Finalizing Agreement.** If an agreement is reached in the conference, parties to the agreement shall reduce its terms to writing and sign it along with their counsel.

C. **The mediation fee shall be paid in accordance with G.S. 143-128(g).**

D. **Failure to compensate mediator.** Any party's failure to compensate the mediators in accordance with G.S. 143-128(g) shall subject that party to a withholding of said amount of money from the party's monthly payment by the public owner.

Should the public owner fail to compensate the mediator, it shall hereby be subject to a civil cause of action from the mediator for the 1/3 portion of the mediator's total fee as required by G.S. 143-128(g).

RULE 5. AUTHORITY AND DUTIES OF MEDIATORS

A. **Authority of Mediator.**

1) *Control of Conference.* The mediator shall at all times be in control of the conference and the procedures to be followed.
2) *Private Consultation.* The mediator may communicate privately with any participant or counsel prior to and during the conference. The fact that private communications have occurred with a participant shall be disclosed to all other participants at the beginning of the conference.
3) *Scheduling the Conference.* The mediator shall make a good faith effort to schedule the conference at a time that is convenient with the participants, attorneys and mediator. In the absence of agreement, the mediator shall select the date for the conference.

B. **Duties of Mediator.**

1) The mediator shall define and describe the following at the beginning of the conference:
   a) The process of mediation;
   b) The difference between mediation and other forms of conflict resolution;
   c) The costs of the mediated settlement conference;
   d) That the mediated settlement conference is not a trial, the mediator is not a judge, and the parties retain their legal rights if they do not reach settlement;
   e) The circumstances under which the mediator may meet and communicate privately with any of the parties or with any other person;
   f) Whether and under what conditions communications with the mediator will be held in confidence during the conference;
   g) The inadmissibility of conduct and statements as provided by G.S. 7A-38.1(1);
   h) The duties and responsibilities of the mediator and the participants; and
   i) That any agreement reached will be reached by mutual consent.
2) *Disclosure.* The mediator has a duty to be impartial and to advise all participants of any circumstance bearing on possible bias, prejudice or partiality.
3) *Declaring Impasse.* It is the duty of the mediator timely to determine that an impasse exists and that the conference should end.
4) *Reporting Results of Conference.* The mediator shall report to the SCO or public owner within 10 days of the conference whether or not an agreement was reached by the parties. If an agreement was reached, the report shall state the nature of said agreement. The mediator's report shall inform the SCO or public owner of the absence of any party known to the mediator to have been absent from the mediated settlement conference without permission. The SCO or public owner may require the mediator to provide statistical data for evaluation of the mediated settlement conference program.
5) *Scheduling and Holding the Conference.* It is the duty of the mediator to schedule the conference and conduct it prior to the deadline of completion set by the rules. Deadlines for completion of the conference shall be strictly observed by the mediator unless said time limit is changed by a written order of the SCO or public owner.

RULE 6. COMPENSATION OF THE MEDIATOR

A. **By Agreement.** When the mediator is stipulated by the parties, compensation shall be as agreed upon between the parties and the mediator provided that the provision of G.S. 143-128(g) are observed.
B. **By Appointment.** When the mediator is appointed by the SCO or public owner, the parties shall compensate the mediator for mediation services at the rate in accordance with the rate charged for Superior Court mediation. The parties shall also pay to the mediator a one-time per case administrative rate in accordance with the rate charged for Superior Court mediation, which is due upon appointment.

RULE 7. MEDIATOR CERTIFICATION.

All mediators certified in the Formal Dispute Resolution Program shall be properly certified in accordance with the rules certifying mediators in Superior Court in North Carolina. * When selecting mediators, the parties may designate a preference for mediators with a background in construction law or public construction contracting. Such requirements, while preferred, are not mandatory under these rules.

All mediators chosen must either demonstrate they are certified in accordance with the Rules Implementing Scheduled Mediated Settlement Conference in Superior Court or must gain the consent of the SCO or public owner to mediate any dispute in accordance with these rules.

* Except when otherwise allowed by the SCO or public owner upon the request of the parties to the mediation.

RULE 8. RULE MAKING

These Rules are subject to amendment by rule making by the State Building Commission.

These Rules are mandated for State projects when the contracting state entity has not otherwise adopted its own dispute resolution provision. These rules are optional for all other projects subject to Article 8, Ch. 143 of the General Statutes.

RULE 9. DEFINITIONS

When the phrase "SCO or public owner" is used in these rules, "SCO" shall apply to state projects, "public owner" shall apply to non-state public projects.

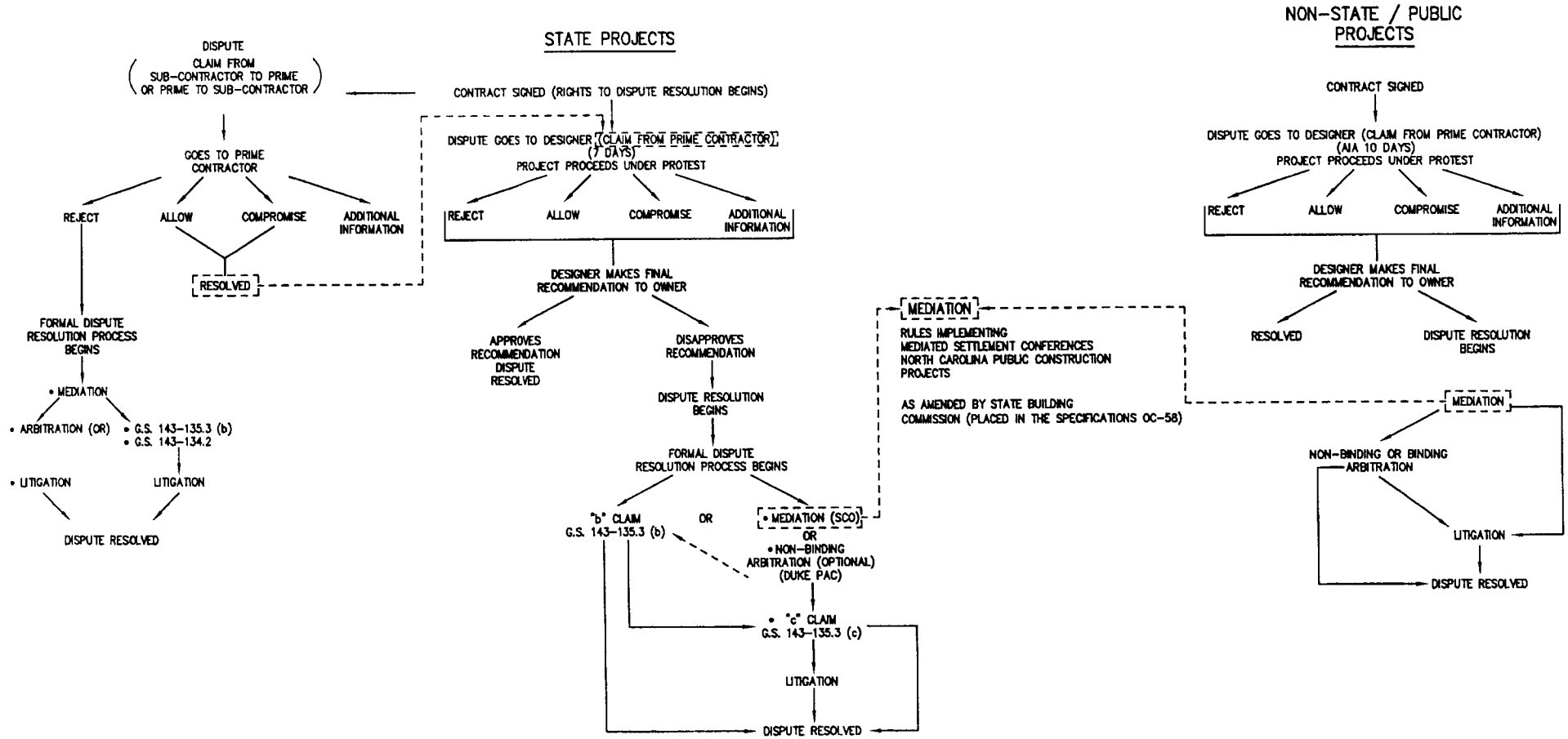
RULE 10. TIME LIMITS

On state contracts, any time limit provided for by these Rules may be waived or extended by the SCO for good cause shown.

On non-state contracts, any time limit provided for by these Rules may be waived or extended by the mediator it appoints for good cause shown. If the mediator has not yet been appointed, the designer of record shall decide all waivers or extensions of time for good cause shown.

Exhibit A

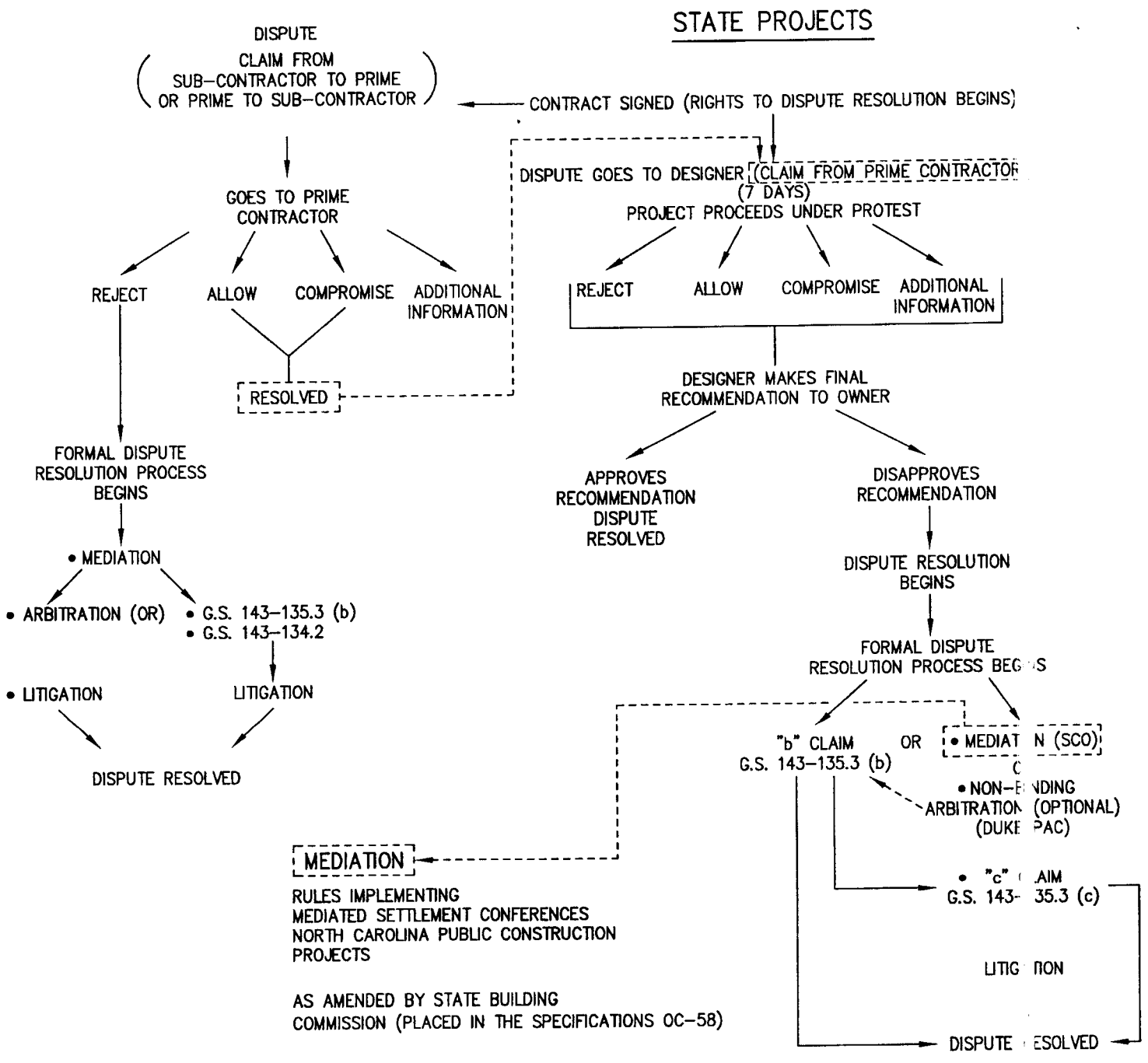
DISPUTE RESOLUTION



2/26/02

Exhibit A

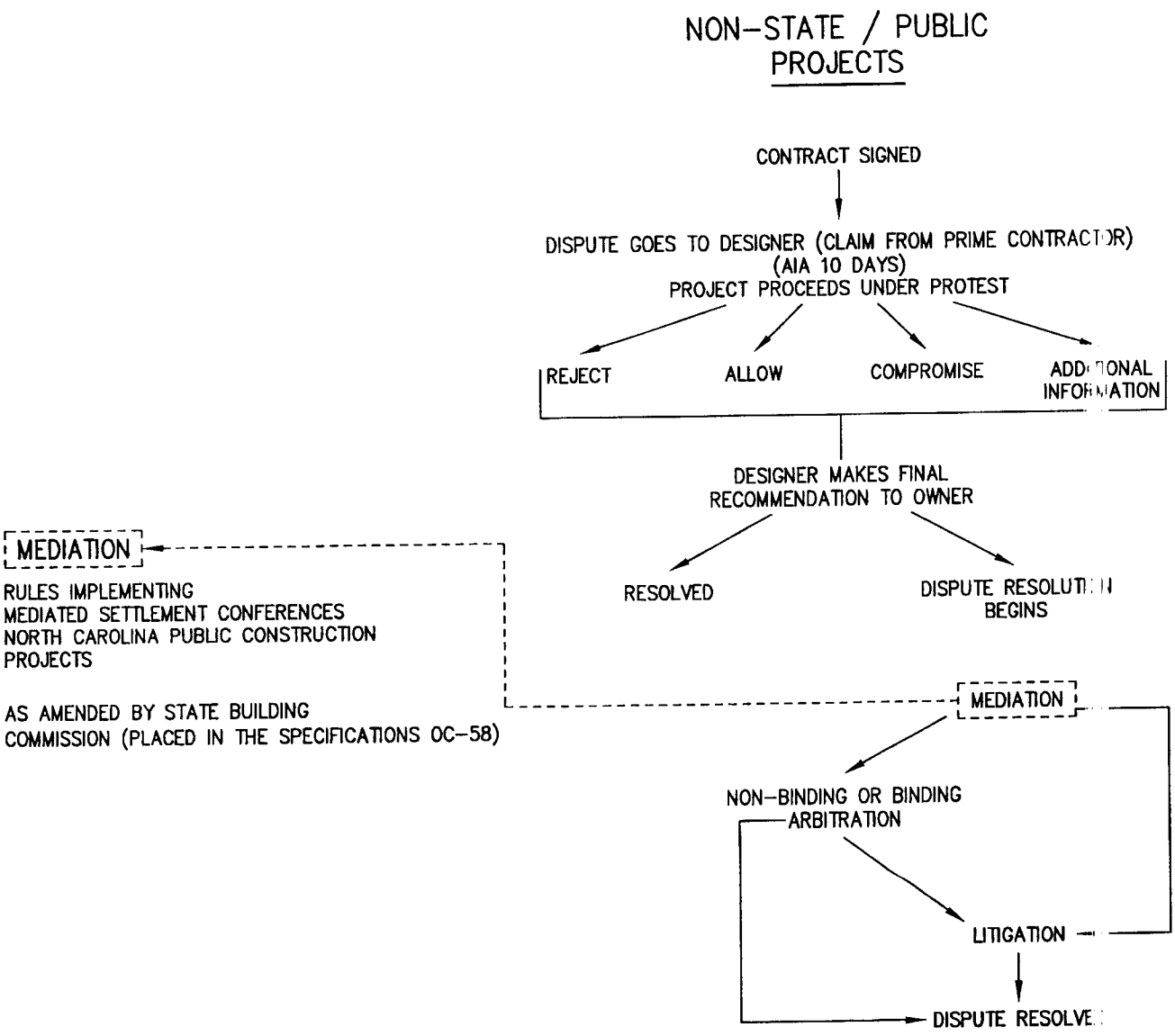
DISPUTE RESOLUTION



/26/02

Exhibit A

DISPUTE RESOLUTION



SECTION 00 73 84

PROJECT PERMITS

1. NC DOT 16.1 Right of Way Encroachment Agreement Primary and Secondary Highways
2. NC DOT 16.2 Right of Way Encroachment Agreement Interstate and Other Controlled Access Highways
3. NC DOT Street and Driveway Access Permit
4. NC-DEQ DEMLR Erosion Control Permit
5. NC-DEQ PWSS Application for Approval of Engineering Plans and Specs for Water Supply Systems
6. Norfolk Southern Railroad

END OF SECTION

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

JOSH STEIN
GOVERNOR

J.R. "JOEY" HOPKINS
SECRETARY

June 20, 2025

Piedmont Triad Regional Water Authority (PTRWA)
c/o Gregory Flory, PE
7297 Adams Farms Road
Randleman, NC 27317

SUBJECT: ENCROACHMENT AGREEMENT (E081-076-24-00699)
Water Line Installation
SR-1009 (US Hwy 311), SR-1511 (Heath Dairy Rd), SR-1712 (Pineview Rd), SR-1951 (Island Ford Rd), SR-1952 (Old High Point St), SR-1953 (Brown Loop), SR 2072 (Brookwood Acres Dr)
Randolph County

Dear Mr. Flory,

Attached is a properly executed copy of a Right of Way Encroachment Agreement which covers the following:

Installation of 18,255 LF of 16" DI waterline via (8) Bore & Jack crossings and open trench, and 566 LF of 20" HDPE waterline via HDD in Randolph County, and any associated pre-construction work.

This agreement is approved subject to the Special Provisions and plans which are attached to and made a part of the Encroachment Agreement. Any work associated with the subject project permitted under an NCDOT approved Driveway Permit shall be completed in accordance with this Encroachment Agreement.

The plans and special provisions are an essential part of this encroachment. In case of discrepancy the Special Provisions shall govern over the Plans.

Sincerely,

Reuben Blakley, PE
Division Engineer

Signed by:
FB2FB7888E8F4AF...

By: Jennifer Britt, PE
Senior Assistant District Engineer

Mailing Address:
NC DEPARTMENT OF TRANSPORTATION
DISTRICT OFFICE
300 DOT DRIVE
ASHEBORO, NC 27205

Telephone: (336) 318-4000
Fax: (336) 318-4010
Customer Service: 1-877-368-4968

Website: www.ncdot.gov

Location:
300 DOT DRIVE
ASHEBORO, NC 27205

Pre-Construction

Contact Offices & Outside Agency issues / Contacts / Info.

1. Approval may be rescinded upon failure to follow any of the provisions in this permit and may be considered a violation of the encroachment agreement.

2. The Encroaching party or their contractor shall provide the following notices prior to construction activity within the NCDOT Right of Way:
   a. Three (3) business days advance phone call at telephone (336)318-4000 or email to tjkimes@ncdot.gov to the District Engineer's office
   b. If the construction falls within the limits of an NCDOT managed construction project, five (5) business days advance phone call to the Division Construction Engineer, at (910)773-8027or email to tlmorgan@ncdot.gov.

   Failure to provide these notifications prior to beginning construction is subject to the Division Engineer's discretion to cease construction activity for this encroachment. NCDOT reserves the right to cease any construction or maintenance work associated with this installation by the encroaching party until the construction or maintenance meets the satisfaction of the Division Engineer or their representative.

3. Prior to beginning work, it is the requirement of the Encroaching Party to contact the appropriate Utility Companies involved and make arrangements to adjust or relocate any utilities that conflict with the proposed work.

4. It shall be the responsibility of the encroaching party to determine the location of utilities within the encroachment area. NCGS § 87-115 through § 87-130 of the Underground Utility Safety and Damage Prevention Act requires underground utilities to be located by calling 811 prior to construction. The encroaching party shall be responsible for notifying other utility owners and providing protection and safeguards to prevent damage or interruption to existing facilities and maintain access to them.

5. The encroaching party shall notify the appropriate municipal office prior to beginning any work within the municipality's limits of jurisdiction.

6. Excavation within 1000 feet of a signalized intersection will require notification by the encroaching party to the Division Traffic Engineer at telephone number (910) 947-3930 no less than one week prior to beginning work. All traffic signal or detection cables must be located prior to excavation. Cost to replace or repair NCDOT signs, signals, pavement markings or associated equipment and facilities shall be the responsibility of the encroaching party.

7. At the option of the District Engineer, a preconstruction meeting including representatives of NCDOT, the encroaching party, contractors and municipality, if applicable, shall be required. A pre-construction conference held between a municipality (or other facility owner) and a contractor without the presence of NCDOT personnel with subsequent construction commencing may be subject to NCDOT personnel ceasing any work on NCDOT right-of-way related to this encroachment until such meeting is held. Contact the District office to schedule.

8. At the discretion of the District Engineer, a NOTIFICATION FOR UTILITY / NON-UTILITY ENCROACHMENT WITHIN NCDOT R/W form (See corresponding attachment) with the scheduled pre-construction meeting and associated construction schedule details must be completed and submitted to the District Engineer's office a minimum of one week prior to construction.

9. At the discretion of the District Engineer, the encroaching party (not the utility contractor) shall make arrangements to have a qualified inspector, under the supervision of a Professional Engineer registered in North Carolina, on site at all times during construction. The registered Professional Engineer shall be required to submit a signed and PE sealed certification that the utility was installed in accordance with the encroachment agreement.

Legal & Right-of-Way Issues

10. This approval and associated plans and supporting documents shall not be interpreted to allow any design change or change in the intent of the design by the Owner, Design Engineer, or any of their representatives. Any revisions or changes to these approved plans or intent for construction must be obtained in writing from the Division Engineer's office or their representative prior to construction or during construction if an issue arises during construction to warrant changes.

11. 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. It is the responsibility of the encroaching party to verify the right of way.

12. Encroaching party shall be responsible for obtaining all necessary permanent and/or temporary construction, drainage, utility and/or sight distance easements.

13. All Right of Way and easements necessary for construction and maintenance shall be dedicated to NCDOT with proof of dedication furnished to the District Engineer prior to beginning work.

14. No commercial advertising shall be allowed within NCDOT Right of Way.

15. The encroaching party shall obtain proper approval from all affected pole owners prior to attachment to any pole.

16. This agreement does not authorize installations within nor encroachment onto railroad rights of way. Permits for installations within railroad right of way must be obtained from the railroad and are the responsibility of the encroaching party.

Work Zone Traffic

17. Traffic control shall be coordinated with the District Engineer and the Division Traffic Engineer, Mr. David Willett at telephone (910) 947-3930, prior to construction.

18. <u>WORK ZONE TRAFFIC CONTROL QUALIFICATIONS AND TRAINING PROGRAM</u>

    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 involved with the installation of Work Zone Traffic Control devices inside the highway right of way are required to be qualified and trained Work Zone Installers. 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 and by private entities that have been pre-approved to train themselves.

For questions and/or additional information regarding this training program please refer to https://connect.ncdot.gov/projects/WZTC/Pages/Training.aspx or call the NCDOT Work Zone Traffic Control Section (919) 814-5000.

19. The party of the second part shall employ traffic control measures that are in accordance with the prevailing federal, state, local, and NCDOT policies, standards, and procedures. These policies, standards, and procedures include, but are not limited to the following:
    a. Manual on Uniform Traffic Control Devices (MUTCD) – North Carolina has adopted the MUTCD to provide basic principles and guidelines for traffic control device design, application, installation, and maintenance. North Carolina uses the MUTCD as a minimum requirement where higher supplemental standards specific to North Carolina are not established. Use fundamental principles and best practices of MUTCD (Part 6, Temporary Traffic Control).
    b. NCDOT Maintenance / Utility Traffic Control Guidelines – This document enhances the fundamental principles and best practices established in MUTCD Part 6, Temporary Traffic Control, incorporating NCDOT-specific standards and details. It also covers important safety knowledge for a wide range of work zone job responsibilities.

20. If the Traffic Control Supervisor determines that portable concrete barrier (PCB) is required to shield a hazard within the clear zone, then PCB shall be designed and sealed by a licensed North Carolina Professional Engineer. PCB plans and design calculations shall be submitted to the District Engineer for review and approval prior to installation.

21. Ingress and egress shall be maintained to all businesses and dwellings affected by the project. Special attention shall be paid to police, EMS and fire stations, fire hydrants, secondary schools, and hospitals.

22. Traffic shall be maintained at all times. All lanes of traffic are to be open during the hours of 7:00 A.M. to 9:00 A.M. and from 4:00 P.M. to 6:00 P.M. Monday through Friday, during any time of inclement weather, **or as directed by the District Engineer**. If the location of work calls for a rolling roadblock on Interstates and divided highway US routes, the restriction is to work only on Sunday from 7:00 A.M. to 10:00 A.M, **or as Directed by the District Engineer**. Any violation of these hours will result in ceasing any further construction by the Encroaching Party or their contractor.

23. Nighttime and weekend operations will NOT be allowed unless written approval is received from the District Engineer. If nighttime or weekend work is allowed or required, all signs must be retro-reflective, and a work zone lighting plan must be submitted for approval prior to construction.

24. The following holiday time restrictions apply to this encroachment agreement:

    HOLIDAY AND HOLIDAY WEEKEND LANE CLOSURE RESTRICTIONS

    1. For **unexpected occurrence** that creates unusually high traffic volumes, as directed by the Engineer.

    2. For **New Year's Day**, between the hours of 7:00 a.m. December 31st and 6:00 p.m. January 2nd. If New Year's Day is on a Friday, Saturday, Sunday or Monday, then until 6:00 p.m. the following Tuesday.

    3. For **Easter**, between the hours of 7:00 a.m. Thursday and 6:00 p.m. Monday.

    4. For **Memorial Day**, between the hours of 7:00 a.m. Friday and 6:00 p.m. Tuesday.

    5. For **Independence Day**, between the hours of 7:00 a.m. the day before Independence Day and 6:00 p.m. the day after Independence Day.

       If **Independence Day** is on a Friday, Saturday, Sunday or Monday, then between the hours of 7:00 A.M. the Thursday before Independence Day and 6:00 P.M. the Tuesday after Independence Day.

    6. For **Labor Day**, between the hours of 7:00 a.m. Friday and 6:00 p.m. Tuesday.

    7. For **Thanksgiving Day**, between the hours of 7:00 a.m. Tuesday and 6:00 p.m. Monday.

    8. For **Christmas**, between the hours of 7:00 a.m. the Friday before the week of Christmas Day and 6:00 p.m. the following Tuesday after the week of Christmas Day.

    Holidays and holiday weekends shall include New Year's, Easter, Memorial Day, Independence Day, Labor Day, Thanksgiving, and Christmas. The Contractor shall schedule his/her work so that lane closures are not required during these periods, unless otherwise directed by the Engineer.

25. Utility work is not allowed during local events without prior written approval from the District Engineer. If the construction is within 1000 feet of a school location or on a designated bus route, the construction shall be coordinated with the school start and end times to avoid traffic delays.

26. Work requiring lane or shoulder closures shall not be performed on both sides of the road simultaneously within the same area.

27. Any work requiring equipment or personnel within 5 feet of the edge of any travel lane of an undivided facility and within 10 feet of the edge of any travel lane of a divided facility shall require a lane closure with appropriate tapers per current *NCDOT Roadway Standard Drawings or MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES*.

28. At the discretion of the District Engineer, a traffic control plan shall be developed and submitted under the seal and signature of a Licensed North Carolina Professional Engineer prior to construction. The plan shall be specific to the site and adequately detailed. Issues such as the close proximity to intersections shall be addressed.

29. Temporary and final pavement markings are the responsibility of the encroaching party. Final pavement markings and sign plans shall be submitted with the encroachment request to the Division Traffic Engineer prior to construction. Final pavement markings shall be thermoplastic unless otherwise directed by the Division Traffic Engineer or District Engineer.

30. Any pavement markings that are damaged or obliterated shall be restored by the encroaching party at no expense to NCDOT.

31. Sidewalk closures shall be installed as necessary. Pedestrian traffic shall be detoured around these closures and shall be signed appropriately and in accordance with The American with Disabilities Act Accessibility Guidelines. The encroaching party must adhere to the guidelines for accommodating pedestrians in encroachment work zones as described in the NCDOT Pedestrian Work Zone Accommodations Training found at https://www.youtube.com/watch?v=AOuYa5IW3dg&feature=youtu.be

Roadside Environmental

32. 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. Additional information can be obtained by contacting the NCDOT Roadside Environmental Engineer regarding the North Carolina Natural Heritage Program or the United States Fish and Wildlife Services. Contact the Division Roadside Environmental Engineer's Office at (910) 944-2344

33. When surface area in excess of one acre will be disturbed, the Encroacher shall submit a Sediment and Erosion Control Plan which has been approved by the appropriate regulatory agency or authority prior to beginning any work on the Right of Way. Failure to provide this information shall be grounds for suspension of operations. Proper temporary and permanent measures shall be used to control erosion and sedimentation in accordance with the approved sediment and erosion control plan.

34. The Verification of Compliance with Environmental Regulations (VCER-1) form is required for all non-utility encroachment agreements or any utility encroachments when land disturbance within NCDOT right of way exceeds 1 acre. When required, the VCER-1 form must be PE sealed by a NC registered professional engineer who has verified that all appropriate environmental permits (if applicable) have been obtained and all applicable environmental regulations have been followed.

35. All erosion control devices and measures shall be constructed, installed, maintained, and removed by the Encroacher in accordance with all applicable Federal, State, and Local laws, regulations, ordinances, and policies. Permanent vegetation shall be established on all disturbed areas in accordance with the recommendations of the Division Roadside Environmental Engineer. All areas disturbed (shoulders, ditches, removed accesses, etc.) shall be graded and seeded in accordance with the latest *NCDOT Standards Specifications for Roads and Structures* and within 15 calendar days with an approved NCDOT seed mixture (all lawn type areas shall be maintained and reseeded as such). Seeding rates per acre shall be applied according to the Division Roadside Environmental Engineer. Any plant or vegetation in the NCDOT planted sites that is destroyed or damaged as a result of this encroachment shall be replaced with plants of like kind or similar shape.

36. No trees within NCDOT right of way shall be cut without authorization from the Division Roadside Environmental Engineer. An inventory of trees measuring greater than 4 caliper inches (measured 6" above the ground) is required when trees within C/A right of way will be impacted by the

encroachment installation. Mitigation is required and will be determined by the Division Roadside Environmental Engineer's Office.

37. Prior to installation, the Encroaching Party shall contact the District Engineer to discuss any environmental issues associated with the installation to address concerns related to the root system of trees impacted by boring or non-utility construction of sidewalk, roadway widening, etc.

38. The applicant is responsible for identifying project impacts to waters of the United States (wetlands, intermittent streams, perennial streams and ponds) located within the NCDOT right-of-way. The discharge of dredged or fill material into waters of the United States requires authorization from the United States Army Corps of Engineers (USACE) and certification from the North Carolina Division of Water Quality (NCDWQ). The applicant is required to obtain pertinent permits or certification from these regulatory agencies if construction of the project impacts waters of the United States within the NCDOT right-of-way. The applicant is responsible for complying with any river or stream Riparian Buffer Rule as regulated by the NCDWQ. The Rule regulates activity within a 50-foot buffer along perennial streams, intermittent streams and ponds. Additional information can be obtained by contacting the NCDWQ or the USACE.

39. The contractor shall not begin the construction until after the traffic control and erosion control devices have been installed to the satisfaction of the Division Engineer or their agent.

40. The contractor shall perform all monitoring and record keeping and any required maintenance of erosion and sediment control measures to maintain compliance with stormwater regulations.

Construction

General

41. An executed copy of the encroachment agreement, provisions and approved plans shall be present at the construction site at all times. 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.

42. If the approved method of construction is unsuccessful and other means are required, prior approval must be obtained through the District Engineer before construction may continue.

43. Any REVISIONS marked in RED on the attached non-PE sealed plans shall be incorporated into and made part of the approved encroachment agreement.

44. All disturbed areas are to be fully restored to current NCDOT minimum roadway standards or as directed by the Division Engineer or their representative. Disturbed areas within NCDOT Right-of-Way include, but not limited to, any excavation areas, pavement removal, drainage or other features.

45. The encroaching party shall notify the Division Engineer or their representative immediately in the event any drainage structure is blocked, disturbed or damaged. All drainage structures disturbed, damaged or blocked shall be restored to its original condition as directed by the Division Engineer or their representative.

46. A minimum of 5 feet clearance is required for utility installations beneath or near drainage pipes, headwalls, and a minimum of two-foot clearance below the flowline of streams. If directional drilling, a minimum ten-foot clearance distance is required from drainage structures and a minimum of 5 feet below flowline of streams.

47. At points where the utility is placed under existing storm drainage, the trench will be backfilled with excavatable flowable fill up to the outside diameter of the existing pipe.

48. Unless specified otherwise, during non-working hours, equipment shall be located away from the job site or 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 Zone. Also, during non-working hours, no parking or material storage shall be allowed along the shoulders of any state-maintained roadway.

49. The Encroaching Party and/or their Contractor shall comply with all OSHA requirements. If OSHA visits the work area associated with this encroachment, the District Office shall be notified by the encroaching party immediately if any violations are cited.

50. Any guardrail removed or damaged during construction shall be replaced or repaired to its original condition, meeting current NCDOT standards or as directed by the Division Engineer or their representative.

51. Right of Way monuments disturbed during construction shall be referenced by a registered Land Surveyor and reset after construction.

52. All Traffic signs moved during construction shall be reinstalled as soon as possible to the satisfaction of the Division Engineer or their representative.

53. Detection tape, where required by NCGS § 87-115 through § 87-130 of the Underground Utility Safety and Damage Prevention Act, shall be buried in the trench approximately 1 foot above the installed facility. Where conduit is installed in the right of way and is not of ferrous material, locating tape or detection wire shall be installed with the conduit.

54. All driveways disturbed during construction shall be returned to a state comparable with the condition of the driveways prior to construction.

55. Conformance with driveway permit review should be required in conjunction with this encroachment agreement. In the event there is a conflict between the driveway permit and the encroachment agreement, the District Engineer should resolve the conflict and notify the parties involved.

Engineering

56. All traffic control, asphalt mixes, structures, construction, workmanship and construction methods, and materials shall be in compliance with the most-recent versions of the following resources: *ASTM Standards, Manual on Uniform Traffic Control Devices, NCDOT Utilities Accommodations Manual, NCDOT Standard Specifications for Roads and Structures, NCDOT Roadway Standard Drawings,* NCDOT *Asphalt Quality Management System* manual, **and the approved plans.**

57. Regulator stations, metering stations, cathodic test stations, and anode beds are not permitted within NCDOT right of way. Header wires are permitted.

58. Non-Utility Communication and Data Transmission installations (ground mounted type or Small Cell pole-mounted type) must adhere to guidelines in the Utilities Accommodations Manual and, when located within municipal jurisdictions, are subject to review and approval by municipal ordinances and any additional municipal approval for proximity to historic districts and landmarks. All wiring

and related telecommunications work shall conform to the latest regulations by the Federal Communications Commission.

59. All wiring and related electrical work shall conform to the latest edition of the National Electrical Safety Code.

60. Prior approval for any blasting must be obtained from the Division Engineer or their representative.

Location within R/W

61. All utility access points, such as manholes, vaults, handholes, splice boxes and junction boxes shall be located as close to the right of way line as possible and shall not be placed in the ditch line, side slopes of the ditches or in the pavement. All manholes, handholes, splice boxes, junction boxes and vaults and covers shall be flush with the ground when located within the vehicle clear zone. Slack loops for telecommunications in industry standard housing units shall be buried a minimum of 18 inches when buried or meet minimum NCDOT vertical and horizontal clearances when installed aerially.

62. Any utility markers, cabinets, pedestals, meter bases and services for meter reading required shall be as close to the Right of Way line as possible. If it is not feasible to install at or near Right of Way line, then written approval shall be obtained from NCDOT prior to installation.

63. Fire Hydrants shall be of the breakaway type. Hydrants shall be placed near the right of way line. In curb and gutter sections with written approval from the District, the hydrants may be placed at 6' behind the back of the curb or minimum 2’ back of sidewalk.

64. Hot box (aka ASSE 1060) or Safe-T-Cover type enclosures covering utility main pipe joints, backflow preventers, valves, vent pipes, cross connections, pumps, grinders, irrigation assemblies, transformers, generators, and other similar large appurtenances shall be located outside sight distance triangles and off of the NCDOT Right-of-Way.

65. Sprinkler heads shall be located a minimum of 10 feet from the edge of pavement, edge of shoulder, or back of curb whichever is greater and shall be directed so that water does not spray or drain on the roadway surface, sidewalk, or passing vehicles at any time. Upon completion of the installation and prior to activation of the system, the Encroacher shall contact the District Engineer to schedule a test of the system to verify the spray pattern. Sprinkler systems shall not be operated during periods of high wind or freezing weather, or to the extent that the subgrade adjacent to the pavement structure becomes saturated. NCDOT reserves the right to require immediate termination and removal of any sprinkler system which in its judgement and opinion adversely affects safety, maintenance, or operation of the roadway.

66. Luminaire and/or utility poles and guy wires shall be set as close to the Right of Way line as practical and outside the Clear Zone in accordance with the latest version of the AASHTO Roadside Design Guide (See corresponding attachment) or made breakaway in accordance with the requirements of NCHRP Report 350. Any relocation of the utility poles from the original design due to Clear Zone requirements shall require a re-submittal for the utility design.

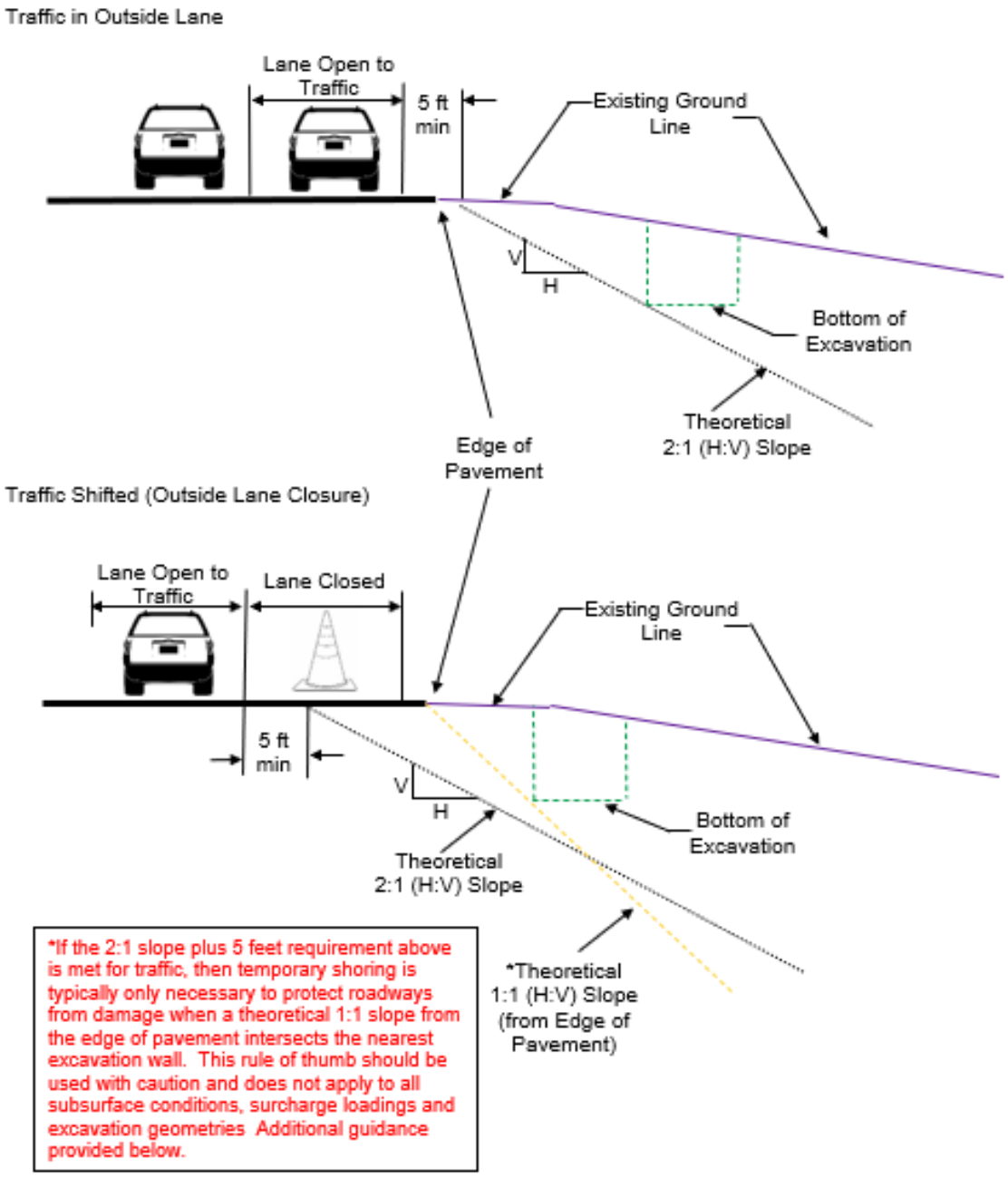
67. Luminaire and/or utility poles shall be set a minimum of 5’-6” behind face of any guardrail or otherwise sufficiently protected. However, standard placement may be reduced to 3’-6” behind face of guardrail when posts are spaced 3’-1 ½”, or where speed limit is less than 55 MPH.

Excavation

68. Excavation material shall not be placed on pavement.

69. It is the responsibility of the encroaching party or their contractor to prevent any mud/dirt from tracking onto the roadway. Any dirt which may collect on the roadway pavement from equipment and/or truck traffic on site shall be immediately removed to avoid any unsafe traffic conditions.

70. The utility shall be installed within 5 feet of the right of way line and outside the 5-foot minimum from travel lane plus theoretical 2:1 slope from the edge of pavement to the bottom of the nearest excavation wall for temporary shoring. Temporary shoring is required when a theoretical 2:1 slope from the bottom of excavation will intersect the existing ground line less than 5 feet from the outside edge of an open travel lane as shown in the figure below or when a theoretical 2:1 slope from the bottom of excavation will intersect any existing structure, support, utility, property, etc. to be protected.



If the 2:1 slope plus 5 feet requirement above is met for traffic, then temporary shoring is typically only necessary to protect roadways from damage when a theoretical 1:1 slope from the edge of pavement intersects the nearest excavation wall. This rule of thumb should be used with caution and does not apply to all subsurface conditions, surcharge loadings and excavation geometries. Situations where this 1:1 slope is not recommended include groundwater depth is above bottom of excavation or excavation is deeper than 10 feet or in Type B or C soils as defined by OSHA Technical Manual. Temporary shoring may be avoided by locating trenches, bore pits, and other excavations far enough away from the open travel lane, edge of pavement and any existing structure, support, utility, property, etc. to be protected.

Temporary shoring shall be designed and constructed in accordance with current NCDOT Standard Temporary Shoring provisions (refer to https://connect.ncdot.gov/resources/Specifications/Pages/2018-Specifications-and-Special-Provisions.aspx and see SP11 R002

a. Temporary 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. (See NCDOT *Utilities Accommodations Manual* for more information on requirements for shoring plans, design calculations, and subsurface investigation report.) **Trench boxes shall not be accepted as temporary shoring and will not be approved for use in instances where shoring is required to protect the highway, drainage structure, and/or supporting pavement or structure foundation**.
b. All trench excavation inside the limits of the theoretical two-to-one slope plus 5 feet requirement, 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. Any excavation that is not backfilled by the end of the workday must address any safety and traveling public concerns including accommodations for bicycles, pedestrians and persons with disabilities.
c. The trench backfill material shall meet the Statewide Borrow Criteria. The trench shall be backfilled in accordance with Section 300-7 of the latest *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 AASHTO T99 as modified by DOT.
d. At the discretion of the Division Engineer, 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.
e. The length of parallel excavation shall be limited to the length necessary to install and backfill one joint of pipe at a time, not to exceed twenty-five (25) feet.

71. 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. The option to backfill any trenches with dirt or either #57 stone or #78 stone with consolidation with a plate tamp and without a conventional density test may be pursued with the written consent of the District Engineer. If this option is exercised, then roadway ABC stone and asphalt repair as required will also be specified by the District Engineer.

Boring

72. Boring equipment will be provided of a type and size to facilitate boring in the local geologic conditions and shall be able to facilitate the encroachment work.

73. When Horizontal Directional Drilling (HDD) is used, the following stipulations apply:

a. Use drilling fluids as appropriate for the type soils but use of water alone is prohibited. Pump drilling fluids only while drilling or reaming. Directional boring using jetting with a Bentonite (or equivalent material) slurry is recommended. Monitor flow rates to match the amount leaving the bore hole and do not increase pressure or flow to free stuck drill heads, reamers or piping. Open cutting to retrieve stuck drill heads is not allowed without prior permission from the District Engineer.
b. The minimum depth shall adhere to the table below for transverse (under non-controlled access, partial controlled access, or limited controlled access roadway) installations and refers to maximum diameter of hole drilled and not the dimension of the carrier or encasement pipe.

Diameter of Drilled Hole (Backream)	Minimum Depth of Cover
2" to 6”	5 feet
>6” to 15”	12 times hole diameter (e.g. 6-inch hole means 6 feet minimum depth)
>15” to 36”	15 feet or greater

c. Under fully controlled access roadway installations, the minimum depth for transverse crossings shall be 15 feet under any pavement (ramps or thru lanes)
d. An overbore (backream diameter) shall not be more than 1.5 times the outside diameter of the pipe or encasement under any highway for pipes 12 inches in diameter or less. For pipes with outer diameter larger than 12 inches, the overbore may be no larger than outer diameter of pipe plus 6 inches. An overbore exceeding 1.5 times greater than the outside diameter of the pipe or encasement may be considered if the encroachment agreement includes a statement signed and sealed by a licensed North Carolina Professional Engineer indicating that an overbore in excess of 1.5 times the outside diameter of the pipe or encasement will appropriately arch and no damage will be done to the pavement or sub-grade.
e. Directional boring is allowed beneath embankment material in naturally occurring soil.
f. Any parallel installation utilizing the directional boring method shall be made at a minimum depth of three (3’) feet (cover) below the ground surface and outside the theoretical 1:1 slope from the existing edge of pavement except where the parallel installation crosses a paved roadway.
g. All directional bores shall maintain ten (10) feet minimum (clear) distance from the nearest part of any structure, including but not limited to bridges, footings, pipe culverts or box culverts. Directional bores are not allowed beneath bridge footings, culvert wingwall footings, slope protection or retaining walls.
h. The tip of the drill string shall have a cutter head.
i. Detection wire shall be installed with non-ferrous material.
j. HDPE pipe installed by directional boring shall not be connected to existing pipe or fittings for one (1) week from the time of installation to allow tensional stresses to relax.

Aerial clearances

74. Vertical clearance of overhead power and communication lines shall meet the National Electrical Safety Code requirements except the minimum vertical clearance shall be 18’ for crossings over NCDOT roadways (24’ over Fully Controlled Access roadways) and 16’ for parallel installations.

75. When applicable for aerial installations, in relation to the bridge, the utility line shall be located with minimum clearances as indicated in Figure 3-3 in the Utilities Accommodations Manual for NCDOT **Required Clearances for Aerial Installations by Encroachment Near Bridge Structures**.

Pavement Detail and Repair

76. The paving of this roadway shall be in accordance with the latest version of NCDOT Standard Specifications, Sections 610, 1012 and 1020. The Contractor shall follow all procedures of the latest Quality Management System (QMS) Asphalt Manual for asphalt pavement - Maintenance Version (see https://connect.ncdot.gov/resources/Materials/MaterialsResources/Forms/Default.aspx) to find the most recent version. The Contractor must adhere to all testing requirements and quality control requirements specified. The Contractor shall contact the NCDOT Division QA Supervisor prior to producing plant mix and make the Supervisor aware that the mix is being produced for a future NCDOT road. Contact the District Engineer to determine the NCDOT Division QA Supervisor. Only NCDOT approved mix designs will be acceptable. A Quality Control Plan shall be submitted (as Directed by the District Engineer) to the District Engineer's Office prior to asphalt production utilizing form QMS-MV1. Failing mixes and/or densities are subject to penalties including monetary payments or removal and replacement. To minimize traffic queuing in construction areas, the possibility of traffic detours may be considered when working on high traffic routes even if traffic control is used. The District Engineer may require traffic detours.

77. When paving beyond utility installation is involved, a Roadway certification report sealed by a Professional Engineer shall be submitted to the District Engineer's office indicating the following:
    - Pavement thickness by type
    - Pavement density, core and/or test locations
    - Base thickness
    - Base density
    - Subgrade density

    Test frequency and method shall be in conformance with the NCDOT *Materials and Tests Manual*. Test must be performed by a Certified Technician including name and Certification number on report.

78. "Potholing" (or "daylighting") pavement cores to expose existing utilities shall be made with a circular minimum 12 inch diameter "test" hole to a maximum depth of 12 inches. Pavement core locations shall not be placed in the wheel path whenever possible. Vacuum excavation shall be utilized to expose underground utilities below pavement subgrade. Displaced dirt and rock debris must be suctioned away from the excavation area through a large hose to a vacuum truck and disposed by the encroaching party. Avoid using mechanized equipment in the proximity of all exposed underground utility lines. Pavement cores shall be repaired within the same working day.

    Excavation must be backfilled same-day, and prior to turning traffic over the cored area. Contractor has the option to core and excavate up to 1 week ahead and backfill with #57 clean stone same-day with cold-patch as surface layer until bore is completed. Aggregate shall not be used as surface layer in an asphalt section of roadway. Remove #57 stone by vacuum truck and install flowable fill at once. The flowable fill shall be placed up to the existing pavement structure. The asphalt patch shall match the thickness of the existing asphalt or three inches, whichever is greater.
    All materials must be listed on the NCDOT Approved Products List (APL) found at: https://apps.ncdot.gov/vendor/approvedproducts/.

79. The minimum pavement design for pavement repair shall be according to the approved plans. If no pavement design is designated on the approved plans, minimum pavement design shall be in accordance with NCDOT Standard Drawing 654.01 (https://connect.ncdot.gov/resources/Specifications/Pages/default.aspx). The version valid in 2024 through 2030 is located at https://connect.ncdot.gov/resources/Specifications/2024StandardRdwyDrawings/Div%206%20Combined.pdf. The pavement design shall include a mechanical overlay extent to be a minimum of 25 feet each side of the pavement repair area OR as directed by the District Engineer.

80. Pavement cuts shall be repaired the same day the cuts are made unless an asphalt patch cannot be accomplished the same day due to material availability or time restrictions. When the asphalt patch is not feasible, the following apply:

    a. The pavement cut shall be filled to the surface with Flowable Fill per NCDOT's Standards and Specifications.
    b. Once the cut is filled, a minimum ¾-inch steel plate shall be placed and pinned to prevent moving. Plates shall be designed large enough to span a minimum of 1-foot on all sides on the pavement cut.
    c. When flowable fill is used, it shall cure for 24 hours prior to any asphalt material placement. Flowable fill bleed water shall not be present during paving operations. Paving shall not cause damage (shoving, distortion, pumping, etc.) to the flowable fill.
    d. Install and leave "BUMP" signs according to MUTCD until the steel plate has been removed. Once the flowable fill has cured, remove the steel plate, and mill/fill according to the directions of the District Engineer.
    e. All pavement cuts must be sealed with NCDOT approved sealant to prevent future pavement separation or cracking.

81. Any pavement damaged because of settlement of the pavement or damaged by equipment used to perform encroachment work, shall be re-surfaced to the satisfaction of the District Engineer. This may include the removal of pavement and a 50' mechanical overlay. All pavement work and pavement markings (temporary and final) are the responsibility of the Encroaching Party.

Post Construction

Close out/ Inspection

82. The Encroaching party shall notify the District Engineer's office within 2 business days after construction is complete. The District Engineer may perform a construction inspection. Any deficiencies may be noted and reported to the encroaching party to make immediate repairs or resolve any issues to restore the right-of-way to a similar condition prior to construction, including pavement, signage, traffic signals, pavement markings, drainage, structures/pipes, or other highway design features.

83. At the discretion of the District Engineer, a final inspection report may be provided to the encroaching party upon satisfactory completion of the work.

84. When a performance bond is required, a written acknowledgement of the completed work by the District Engineer's office begins the one-year warranty period associated with the performance bond.

85. If the actual construction differs from the approved plans associated with this encroachment, a copy of "as-built" plans shall be submitted to the District Engineer's office in a PDF format and in a current ESRI GIS format within 4 weeks of construction.

Attachment for Clear Zone Guidelines from AASHTO

Clear - Zone Table

TABLE 3.1 (Cont'd)

[U.S. Customary Units]

DESIGN SPEED	DESIGN ADT	FORESLOPES			BACKSLOPES		
		1V:6H or flatter	1V:5H TO 1V:4H	1V:3H	1V:3H	1V:5H TO 1V:4H	1V:6H or flatter
40 mph or less	UNDER 750	7 – 10	7 – 10	**	7 – 10	7 – 10	7 – 10
	750 – 1500	10 – 12	12 – 14	**	10 – 12	10 – 12	10 – 12
	1500 – 6000	12 – 14	14 – 16	**	12 – 14	12 – 14	12 – 14
	OVER 6000	14 – 16	16 – 18	**	14 – 16	14 – 16	14 – 16
45–50 mph	UNDER 750	10 – 12	12 – 14	**	8 – 10	8 – 10	10 – 12
	750 – 1500	14 – 16	16 – 20	**	10 – 12	12 – 14	14 – 16
	1500 – 6000	16 – 18	20 – 26	**	12 – 14	14 – 16	16 – 18
	OVER 6000	20 – 22	24 – 28	**	14 – 16	18 – 20	20 – 22
55 mph	UNDER 750	12 – 14	14 – 18	**	8 – 10	10 – 12	10 – 12
	750 – 1500	16 – 18	20 – 24	**	10 – 12	14 – 16	16 – 18
	1500 – 6000	20 – 22	24 – 30	**	14 – 16	16 – 18	20 – 22
	OVER 6000	22 – 24	26 – 32 *	**	16 – 18	20 – 22	22 – 24
60 mph	UNDER 750	16 – 18	20 – 24	**	10 – 12	12 – 14	14 – 16
	750 – 1500	20 – 24	26 – 32 *	**	12 – 14	16 – 18	20 – 22
	1500 – 6000	26 – 30	32 – 40 *	**	14 – 18	18 – 22	24 – 26
	OVER 6000	30 – 32 *	36 – 44 *	**	20 – 22	24 – 26	26 – 28
65–70 mph	UNDER 750	18 – 20	20 – 26	**	10 – 12	14 – 16	14 – 16
	750 – 1500	24 – 26	28 – 36 *	**	12 – 16	18 – 20	20 – 22
	1500 – 6000	28 – 32 *	34 – 42 *	**	16 – 20	22 – 24	26 – 28
	OVER 6000	30 – 34 *	38 – 46 *	**	22 – 24	26 – 30	28 – 30

* Where a site specific investigation indicates a high probability of continuing crashes, or such occurrences are indicated by crash history, the designer may provide clear-zone distances greater than the clear-zone shown in Table 3.1. Clear zones may be limited to 30 ft for practicality and to provide a consistent roadway template if previous experience with similar projects or designs indicates satisfactory performance.

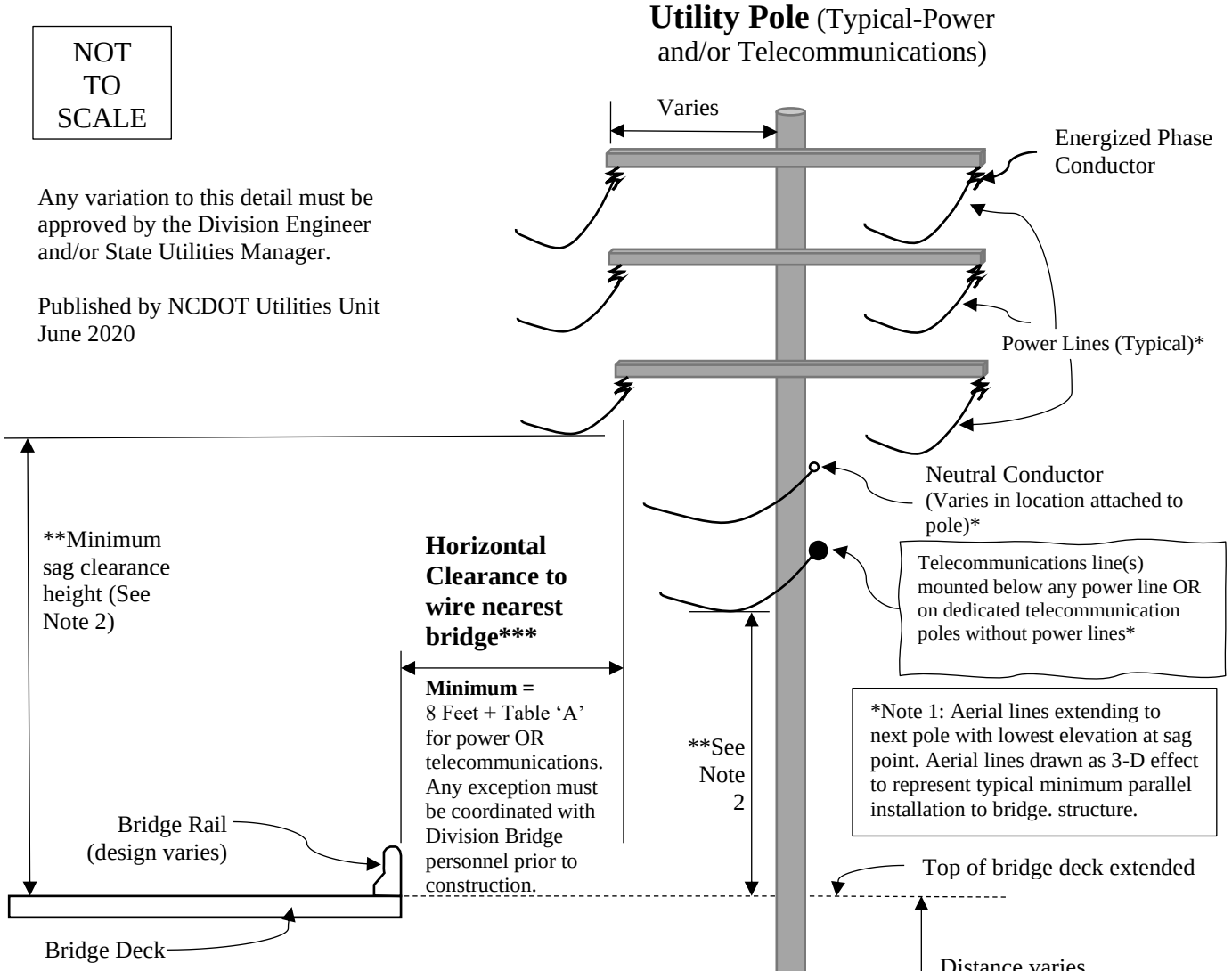
** Since recovery is less likely on the unshielded, traversable 1V:3H slopes, fixed objects should not be present in the vicinity of the toe of these slopes. Recovery of high-speed vehicles that encroach beyond the edge of the shoulder may be expected to occur beyond the toe of slope. Determination of the width of the recovery area at the toe of slope should take into consideration right-of-way availability, environmental concerns, economic factors, safety needs, and crash histories. Also, the distance between the edge of the through traveled lane and the beginning of the 1V:3H slope should influence the recovery area provided at the toe of slope. While the application may be limited by several factors, the foreslope parameters which may enter into determining a maximum desirable recovery area are illustrated in Figure 3.2.

NCDOT Required Clearances for Aerial Installations Near Bridge Structures

NOT TO SCALE

Any variation to this detail must be approved by the Division Engineer and/or State Utilities Manager.

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June 2020



*Note 1: Aerial lines extending to next pole with lowest elevation at sag point. Aerial lines drawn as 3-D effect to represent typical minimum parallel installation to bridge. structure.

Table A – Minimum Horizontal Clearance Distances to POWER Lines (from OSHA)	
VOLTAGE (nominal, kV, alternating current)	MINIMUM CLEARANCE (feet)
Up to 50	10
Over 50 to 200	15
Over 200 to 350	20
Over 350 to 500	25
Over 500 to 750	35
Over 750 to 1000	45
Over 1000	As established by the utility owner/operator or registered professional engineer who is a qualified person with respect to electrical power transmission and distribution

Note 2- **MINIMUN SAG CLEARANCE HEIGHT is 25 feet (applies to telecommunications AND power).

***Note 3: HORIZONTAL CLEARANCE EXCEPTION. If vertical sag clearance height for power above bridge deck is ≥ 45 feet AND voltage is ≤ 350kV, then Minimum Horizontal Clearance may be reduced to 3 feet. Any telecommunications attachment to power pole allowed in this exception must have a minimum 25 feet sag clearance height above bridge deck.

Table 3-1. Minimum Bury Depths using Trenchless Methods

Method	Minimum Depth of Cover
Bore and Jack or Auger[a]	3 feet
HDD[b] (transverse installations under pavement)	
Drilled/ream hole diameter (inches)	
2–6	5 feet
>6–15	12 times hole diameter
>15–36[c]	15 feet or greater
HDD[b] (longitudinal installations parallel to pavement and outside theoretical 1:1 slope from edge of pavement)	
Drilled/ream hole diameter (inches)	
Any size	3 feet
Pipe ramming	
Pipe or casing diameter (inches)	
2–6	4 feet
>6–14	6 times pipe diameter
>14–72	8 feet
Driving/Moling/Pneumatic Hammer	3 feet or 10 times the diameter, whichever is greater
Tunneling	5 feet or 1.5 times the diameter of the bore, whichever is greater

[a] Auger is limited to 6" or less in diameter.

[b] These minimum cover depths apply to HDD installations on roadways with limited controlled access, partially controlled access, or non-controlled access. The minimum cover depth for transverse HDD installations of any size on fully controlled access roadways is 15 feet. Minimum cover depth for longitudinal installations is 3 feet for all highways, with horizontal alignment outside of the theoretical 1:1 slope from edge of pavement and as close to right of way line as practical.

[c] The minimum cover depth for HDD installations of pipe greater than 36 inches in diameter shall be 15 feet and may be greater. These large HDD installations will be reviewed on a case-by-case basis.

Regardless of which trenchless method is used, the minimum depth for crossing under ditches is 2 feet under the unsilted original ditchline. See also Section 3.5.2.2 for HDD installations near structures.

E081-076-24-00699

STATE OF NORTH CAROLINA

ROUTE ~~NC~~ US 311, SR 1511, SR 1712, SR 1951 PROJECT Water Line PTRWA - Asheboro COUNTY OF Randolph

SR 1952, SR 1953, SR 2072

DEPARTMENT OF TRANSPORTATION

RIGHT OF WAY ENCROACHMENT AGREEMENT

PRIMARY AND SECONDARY HIGHWAYS

-AND-

Piedmont Triad Regional Water Authority (PTRWA)

THIS AGREEMENT, made and entered into this the 20 day of June 20 25 by and between the Department of Transportation, party of the first part; and Piedmont Triad Regional Water Authority (PTRWA) party of the second part,

W I T N E S S E T H

THAT WHEREAS, the party of the second part desires to encroach on the right of way of the public road designated as Route(s) ~~NC~~ US 311, SR 1511, SR 1712, SR 1951, SR 1952, SR 1953, SR 2072 , located in Randolph County

with the construction and/or erection of: 18,255 LF of 16-inch DI waterline with 8 Bore & Jack Crossings & 566 LF of 20-inch HDPE waterline via HDD. (1) Metering vault with sampling station will also be constructed.

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 UTILITIES ACCOMMODATIONS MANUAL, 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 Utilities Manager 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 installation or maintenance operation disturbs the ground surface and existing ground cover, the party of the second part agrees to remove and replace the sod or otherwise reestablish the grass cover to meet the satisfaction of the Division Engineer of the party of the first part.

That the party of the second part agrees to assume the actual cost of any inspection of the work considered to be necessary by the Division Engineer of the party of the first part.

That the party of the second part agrees to have available at the construction site, at all times during construction, a copy of this agreement showing evidence of approval by the party of the first part. The party of the first part reserves the right to stop all work unless evidence of approval can be shown.

Provided the work contained in this agreement is being performed on a completed highway open to traffic; the party of the second part agrees to give written notice to the Division Engineer of the party of the first part when all work contained herein has been completed. Unless specifically requested by the party of the first part, written notice of completion of work on highway projects under construction will not be required.

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.

DEPARTMENT OF TRANSPORTATION

BY: Signed by: Jim Britt Sr. Assistant District Engineer

FOR: DIVISION ENGINEER

ATTEST OR WITNESS:

Rebecca J. Brown

Rebecca T. Brown

Finance Director

Gregory Flory, PE

Executive Director

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 State Utilities Manager. 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:

1. All roadways and ramps.
2. Right of way lines and where applicable, the control of access lines.
3. Location of the existing and/or proposed encroachment.
4. Length, size and type of encroachment.
5. Method of installation.
6. Dimensions showing the distance from the encroachment to edge of pavement, shoulders, etc.
7. Location by highway survey station number. If station number cannot be obtained, location should be shown by distance from some identifiable point, such as a bridge, road, intersection, etc. (To assist in preparation of the encroachment plan, the Department's roadway plans may be seen at the various Highway Division Offices, or at the Raleigh office.)
8. Drainage structures or bridges if affected by encroachment (show vertical and horizontal dimensions from encroachment to nearest part of structure).
9. Method of attachment to drainage structures or bridges.
10. Manhole design.
11. On underground utilities, the depth of bury under all traveled lanes, shoulders, ditches, sidewalks, etc.
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 State Utilities Manager 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.

ATTACHMENT FORM

NOTIFICATION FOR UTILITY / NON-UTILITY ENCROACHMENT WITHIN NCDOT R/W

Instructions for use:
This form must be completed in its entirety and submitted directly to the designated personnel in the District Engineer's office via email, fax or hand delivery a minimum of one week prior to construction for the encroachment. If the designated NCDOT personnel names are unknown by the person completing this form, please contact the District Engineer's office to determine that contact info.

Date: _____ Submitted by Name: _____

To: District Personnel Name: Tyler Kimes
District Personnel Email: tjkimes@ncdot.gov
District Phone: 336-318-4000

This notification is to inform you that we (encroaching party or their contractor) will begin construction work on the following project in a minimum of one week.

Encroachment number
(assigned by NCDOT) for the project: _____

Construction start date: _____

Approximate ending date: _____

Contact NCDOT inspector a minimum of 72 hrs. in advance to set-up Preconstruction meeting in the District Engineer's office or other location as directed by the District Engineer

Preconstruction meeting date & time: _____

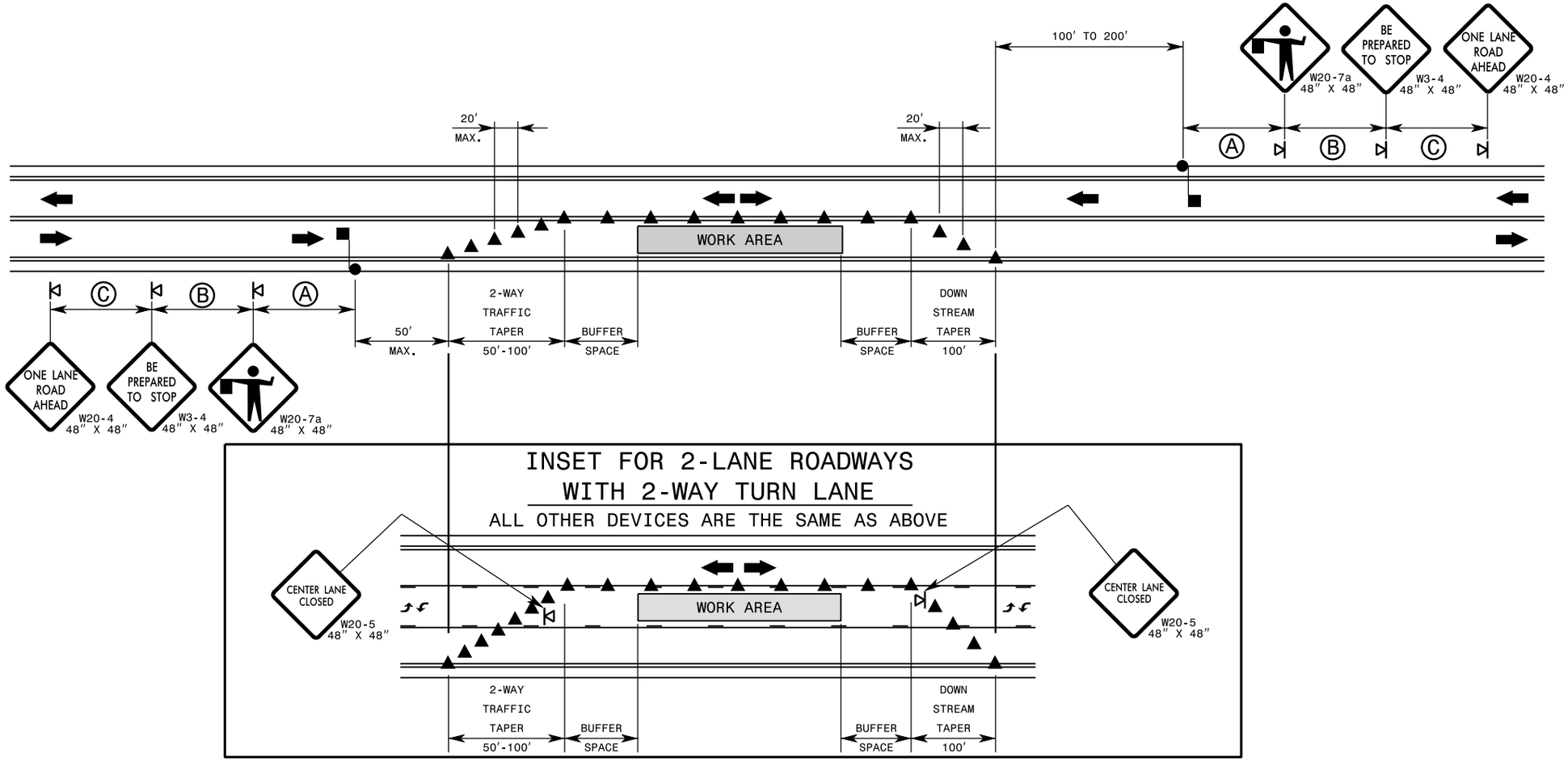
Preconstruction meeting address: _____
_____

Type of project: _____
[Examples: power, telecommunication, water, sewer, gas, petroleum, other (describe)]

Contact Info for this project:

Contractor Company Name:
_____
Contractor Contact Name:
_____
Contractor Phone Number:
_____
Contractor Email:
_____

NCDOT Utility Inspector Name:
Carl Hill
NCDOT Utility Inspector Phone:
336-318-4000
NCDOT Utility Inspector Email:
cjhill1@ncdot.gov
NCDOT Utility Project Manager Name:
Tyler Kimes
NCDOT Utility Project Manager Phone:
336-318-4000
NCDOT Utility Project Manager Email:
tjkimes@ncdot.gov



GENERAL NOTES FOR FLAGGING OPERATIONS

1- REFER TO RSD. 1101.11, SHEETS 1 & 4, FOR "L" DISTANCE AND SIGN SPACING.

2- INSTALL LANE CLOSURES WITH THE TRAFFIC FLOW, BEGINNING WITH DEVICES ON THE UPSTREAM SIDE OF TRAFFIC.

3- REMOVE LANE CLOSURES AGAINST THE TRAFFIC FLOW, BEGINNING WITH DEVICES ON THE DOWNSTREAM SIDE OF TRAFFIC.

4- FOR POSTED SPEED LIMITS BELOW 45 MPH, CHANNELIZING DEVICE SPACING SHALL BE 20 FEET IN THE TAPERS AND THE SHIFTS AND 40 FEET IN THE TANGENTS. FOR POSTED SPEED LIMITS GREATER THAN OR EQUAL TO 45 MPH, CHANNELIZING DEVICE SPACING SHALL BE 40 FEET IN THE TAPERS AND THE SHIFTS AND 80 FEET IN THE TANGENTS.

5- EXTEND LANE CLOSURES AT THE BUFFER SPACE SUCH THAT STOPPING SIGHT DISTANCE IS PROVIDED TO THE FLAGGER (REFER TO RSD. 1101.11, SHEET 2).

6- DO NOT STOP ALL DIRECTIONS OF TRAFFIC FOR MORE THAN 5 MINUTES AT A TIME.

7- DRUMS OR SKINNY DRUMS MAY BE USED IN LIEU OF CONES. REFER TO RSD. 1180.01 FOR SKINNY DRUM REQUIREMENTS.

8- USE FLAGGERS TO CONTROL TRAFFIC AT INTERSECTIONS AFFECTED BY THE LANE CLOSURE. SUPPLEMENT FLAGGERS LOCATED AT INTERSECTIONS WITH FLAGGER AHEAD SIGNS (W20-7A) PLACED APPROXIMATELY 250 FT. IN ADVANCE OF THE FLAGGER. FOR SIGNALIZED INTERSECTIONS PLACE SIGNALS IN THE FLASH MODE AND USE LAW ENFORCEMENT.

9- REFER TO THE CURRENT MUTCD FOR FLAGGER CONTROL, REQUIREMENTS, AND PROCEDURES.

10- DO NOT EXCEED A 1 MILE LANE CLOSURE LENGTH UNLESS OTHERWISE SHOWN IN THE TMP OR AS DIRECTED BY THE ENGINEER.

11- IF VEHICLE QUEUES WILL REACH WITHIN 100′ OF EITHER SIDE OF ACTIVE RAILROAD TRACKS, PROVIDE A UNIFORMED LAW ENFORCEMENT OFFICER OR FLAGGER TO PREVENT VEHICLES FROM STOPPING WITHIN THE GRADE CROSSING. PROVIDE OFFICER OR FLAGGER EVEN IF AUTOMATIC WARNING MEASURES ALREADY EXIST.

12- THIS DETAIL IS APPLICABLE FOR OPERATIONS IN PLACE FOR 72 HOURS OR LESS. FOR LONGER DURATION OPERATIONS, SIGNING AND PAVEMENT MARKINGS MAY NEED TO BE ALTERED.

GENERAL NOTES FOR PILOT CAR OPERATIONS

1- USE PILOT CARS WHEN DIRECTED BY THE ENGINEER.

2- IF ROADWAY WIDTH IS LESS THAN 22 FEET (EOP TO EOP), CONES MAY NOT BE REQUIRED ALONG WORK AREA, AND AT THE DISCRETION OF THE ENGINEER, CONES MAY BE OMITTED ALONG THE WORK AREA IF USING A PILOT CAR.

3- CONES ARE ALWAYS REQUIRED IN THE UPSTREAM AND DOWNSTREAM TAPERS.

4- MOUNT SIGN G20-4 "PILOT CAR FOLLOW ME" AT A CONSPICUOUS POSITION ON THE REAR OF THE PILOT VEHICLE.

5- UNLESS APPROVED BY THE ENGINEER, DO NOT INSTALL MORE THAN ONE (1) MILE OF LANE CLOSURE, MEASURED FROM THE BEGINNING OF THE MERGE TAPER TO THE END OF THE LANE CLOSURE.

6- ADVISE RESIDENTS AND BUSINESSES WITHIN THE LANE CLOSURE LIMITS ABOUT METHODS OF SAFE EGRESS AND INGRESS FROM DRIVEWAYS DURING FLAGGING AND PILOT CAR OPERATIONS.

LEGEND

- FLAGGER
- CONE
- PORTABLE SIGN
- DIRECTION OF TRAFFIC FLOW

STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

1-24

ROADWAY STANDARD DRAWING FOR

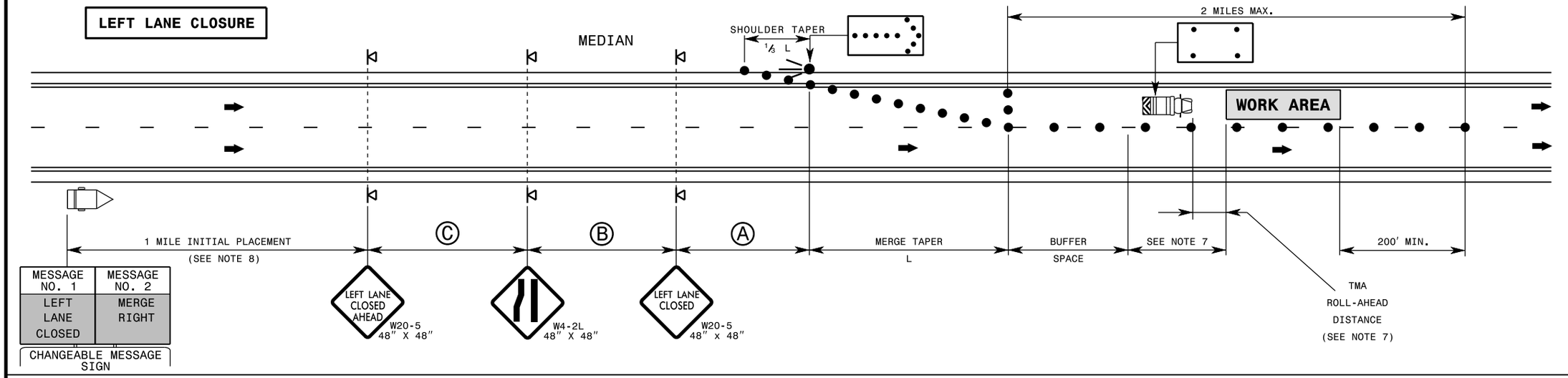
TEMPORARY LANE CLOSURES

2-LANE, 2-WAY ROADWAY-1 LANE CLOSED

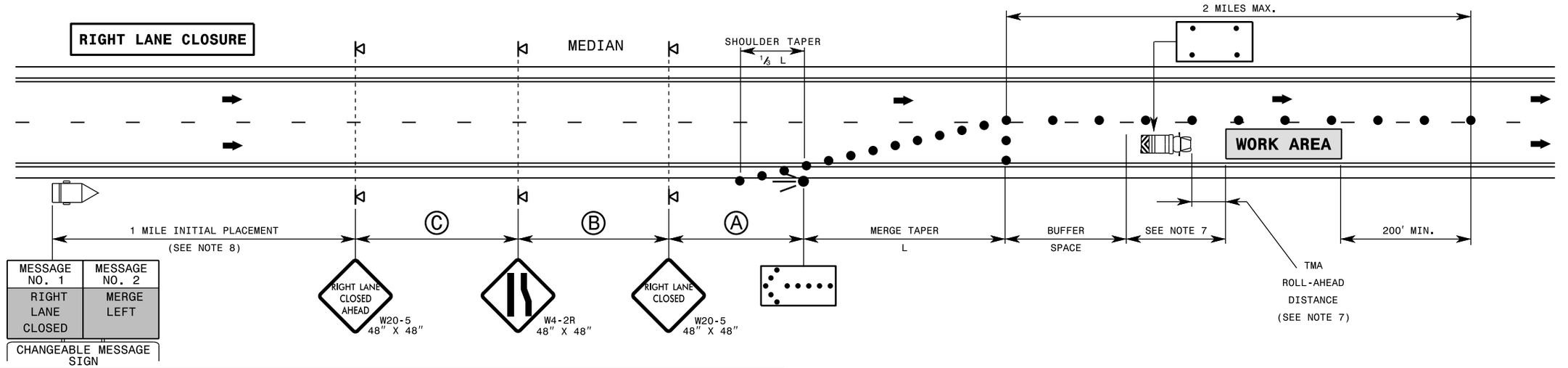
SHEET 1 OF 19

1101.02

LEFT LANE CLOSURE



RIGHT LANE CLOSURE



GENERAL NOTES

1- IF NECESSARY USE THIS RSD. FOR ONE-WAY CITY TYPE STREETS WHERE SIGNS MAY BE MOUNTED ON BOTH SIDES OF THE ROADWAY.

2- PLACE FLASHING ARROW BOARDS (FAB) ON THE SHOULDER (PAVED OR UNPAVED). PLACE FAB WITHIN THE TAPER IF SHOULDERS DO NOT EXIST. MEET THE REQUIREMENTS FOR STOPPING SIGHT DISTANCE AT THE FAB LOCATION. IF NEEDED, EXTEND LANE CLOSURES AT THE BUFFER SPACE, SUCH THAT STOPPING SIGHT DISTANCE TO THE FAB IS MET (SEE RSD. 1101.11, SHEET 2).

3- PLACE DRUMS IN TAPERS AT THE MAXIMUM SPACING EQUAL IN FEET TO THE POSTED SPEED LIMIT. PLACE DRUMS ALONG THE WORK AREA AT THE MAXIMUM SPACING EQUAL IN FEET TO 2 TIMES THE POSTED SPEED LIMIT.

4- REFER TO RSD. 1101.11, SHEETS 1, 2, & 4, FOR "L" DISTANCE, BUFFER SPACE, AND SIGN SPACING.

5- REFER TO RSD. 1101.02, SHEETS 10 & 11, FOR TREATMENT OF LANE CLOSURES THRU INTERCHANGES.

6- INSTALL LANE CLOSURES WITH THE TRAFFIC FLOW, BEGINNING WITH DEVICES ON THE UPSTREAM SIDE OF TRAFFIC. REMOVE LANE CLOSURES AGAINST THE TRAFFIC FLOW, BEGINNING WITH DEVICES ON THE DOWNSTREAM SIDE OF TRAFFIC.

7- POSITION THE TMAs TO MAINTAIN A ROLL-AHEAD DISTANCE AS RECOMMENDED BY RSD 1165.01 AND CONTINUOUSLY ADVANCE TMAs AS WORK PROGRESSES. TMA IS NOT REQUIRED WHEN POSTED SPEED LIMIT IS BELOW 45 MPH.

8- PLACE CHANGEABLE MESSAGE SIGN (CMS) ON THE OUTSIDE OF THE TRAVELWAY, UNLESS DIRECTED OTHERWISE BY THE ENGINEER. PLACE CMS APPROXIMATELY 1 MILE IN ADVANCE OF THE FIRST W20-5 SIGNS. IF TRAFFIC BACKS UP TO WHERE THE CMS IS INITIALLY PLACED, RELOCATE CMS 1/2 MILE IN ADVANCE OF BACKUP. MONITOR TRAFFIC, AND WHEN NECESSARY, MOVE CMS APPROXIMATELY 1/2 MILE IN ADVANCE OF BACKUP. CMS IS NOT REQUIRED WHEN POSTED SPEED LIMIT IS BELOW 45 MPH.

9- DO NOT EXCEED A 2 MILE LANE CLOSURE LENGTH UNLESS OTHERWISE SHOWN IN THE TMP OR AS DIRECTED BY THE ENGINEER.

10- THIS DETAIL IS APPLICABLE FOR OPERATIONS IN PLACE FOR 72 HOURS OR LESS. FOR LONGER DURATION OPERATIONS, SIGNING AND PAVEMENT MARKINGS MAY NEED TO BE ALTERED.

LEGEND

- FLASHING ARROW BOARD
- FLASHING ARROW BOARD (96"X48" MIN.), "CAUTION MODE"
- TRUCK MOUNTED ATTENUATOR(TMA)
- CHANGEABLE MESSAGE SIGN (CMS)
- DRUM
- PORTABLE SIGN
- DIRECTION OF TRAFFIC FLOW

STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

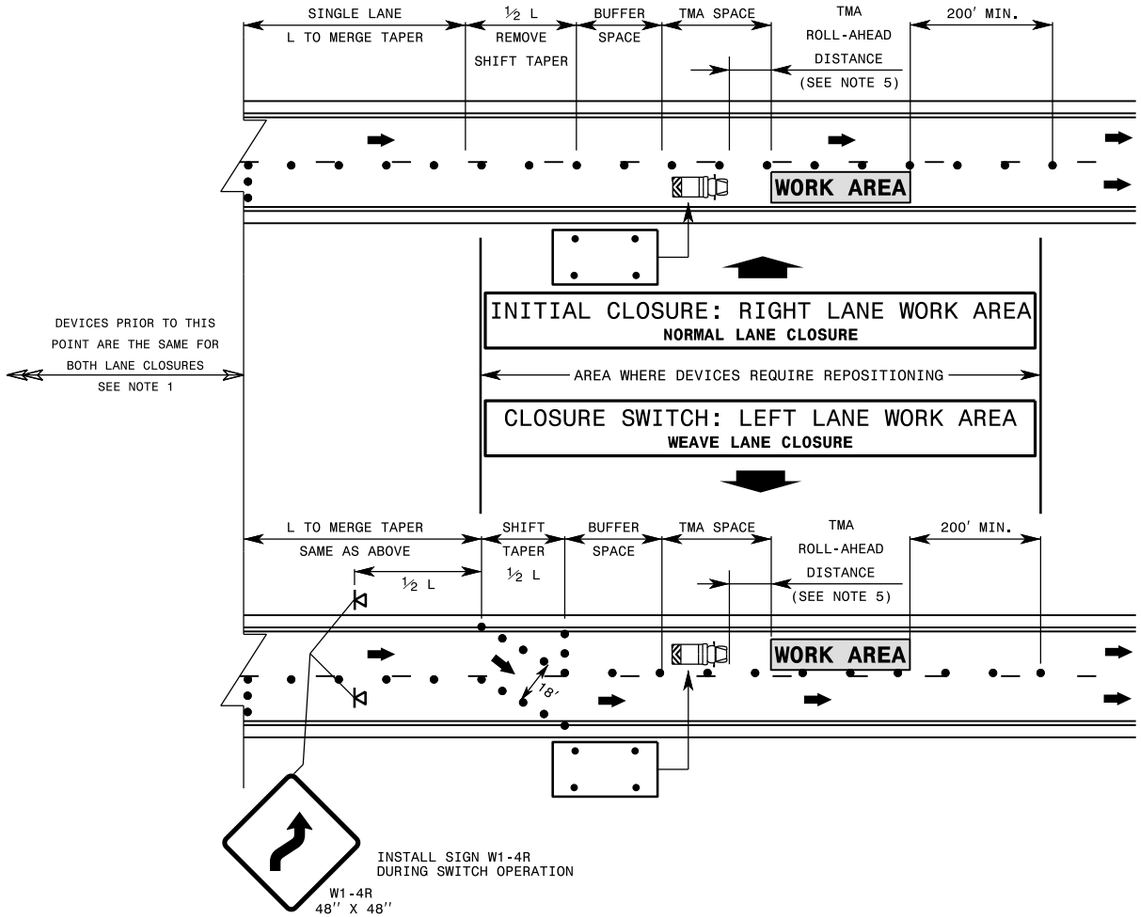
1-24

ROADWAY STANDARD DRAWING FOR

TEMPORARY LANE CLOSURES

DIVIDED MULTI-LANE ROADWAY-1 LANE CLOSED
(FOR ROADWAYS < 60 MPH)

1101.02



GENERAL NOTES

1- REFER TO THE APPROPRIATE LANE CLOSURE RSD 1101.02 FOR SIGNS, DEVICES, AND NOTES FOR THE LANE CLOSURE.

2- THE MAXIMUM SPACING OF DRUMS IN TAPERS SHALL BE EQUAL IN FEET TO THE POSTED SPEED LIMIT. THE MAXIMUM SPACING OF DRUMS ALONG THE BUFFER SPACE, AND WORK AREA, SHALL BE EQUAL IN FEET TO (2) TIMES THE POSTED SPEED LIMIT.

3- REFER TO RSD. 1101.11, SHEET 1, FOR VALUES OF "L".

4- LANE CLOSURE SWITCHES TO BE PERFORMED BY A ROLLING ROADBLOCK OPERATION. SEE RSD 1101.03, SHEET 9.

5- POSITION THE TMAs TO MAINTAIN A ROLL-AHEAD DISTANCE AS RECOMMENDED BY RSD 1165.01 AND CONTINUOUSLY ADVANCE TMAs AS WORK PROGRESSES. TMA IS NOT REQUIRED WHEN POSTED SPEED LIMIT IS BELOW 45 MPH.

6- THIS DETAIL IS APPLICABLE FOR OPERATIONS IN PLACE FOR 72 HOURS OR LESS. FOR LONGER DURATION OPERATIONS, SIGNING AND PAVEMENT MARKINGS MAY NEED TO BE ALTERED.

LEGEND

- FLASHING ARROW BOARD, (96"X48" MIN.), "CAUTION MODE"
- TRUCK MOUNTED ATTENUATOR (TMA)
- DRUM
- PORTABLE SIGN
- DIRECTION OF TRAFFIC FLOW

STATE OF
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DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

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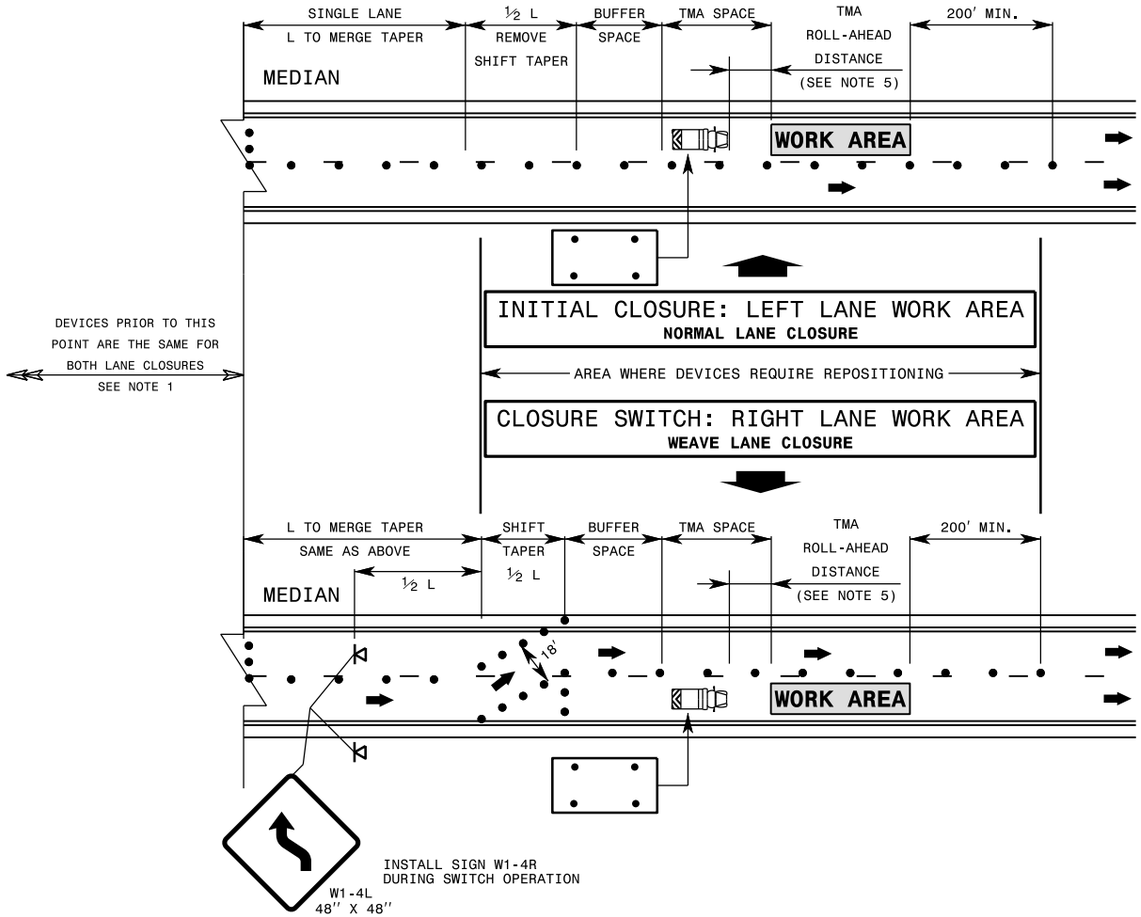
ROADWAY STANDARD DRAWING FOR

TEMPORARY LANE CLOSURES

LANE CLOSURE SWITCHES FOR DIVIDED ROADWAYS

SHEET 5 OF 19

1101.02



GENERAL NOTES

1- REFER TO THE APPROPRIATE LANE CLOSURE RSD 1101.02 FOR SIGNS, DEVICES, AND NOTES FOR THE LANE CLOSURE.

2- THE MAXIMUM SPACING OF DRUMS IN TAPERS SHALL BE EQUAL IN FEET TO THE POSTED SPEED LIMIT. THE MAXIMUM SPACING OF DRUMS ALONG THE BUFFER SPACE, AND WORK AREA, SHALL BE EQUAL IN FEET TO (2) TIMES THE POSTED SPEED LIMIT.

3- REFER TO RSD. 1101.11, SHEET 1, FOR VALUES OF "L".

4- LANE CLOSURE SWITCHES TO BE PERFORMED BY A ROLLING ROADBLOCK OPERATION. SEE RSD 1101.03, SHEET 9.

5- POSITION THE TMAs TO MAINTAIN A ROLL-AHEAD DISTANCE AS RECOMMENDED BY RSD 1165.01 AND CONTINUOUSLY ADVANCE TMAs AS WORK PROGRESSES. TMA IS NOT REQUIRED WHEN POSTED SPEED LIMIT IS BELOW 45 MPH.

6- THIS DETAIL IS APPLICABLE FOR OPERATIONS IN PLACE FOR 72 HOURS OR LESS. FOR LONGER DURATION OPERATIONS, SIGNING AND PAVEMENT MARKINGS MAY NEED TO BE ALTERED.

LEGEND

- FLASHING ARROW BOARD, (96"X48" MIN.), "CAUTION MODE"
- TRUCK MOUNTED ATTENUATOR (TMA)
- DRUM
- PORTABLE SIGN
- DIRECTION OF TRAFFIC FLOW

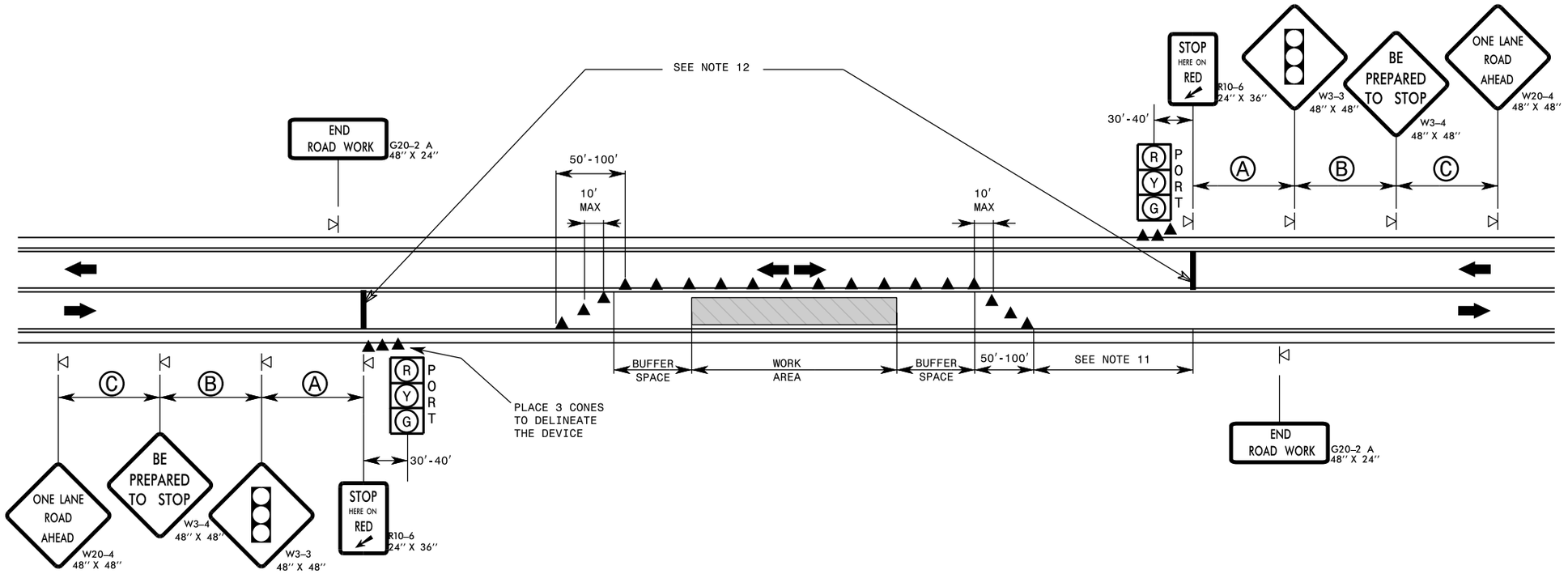
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RALEIGH, N.C.

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ROADWAY STANDARD DRAWING FOR

TEMPORARY LANE CLOSURES

LANE CLOSURE SWITCHES FOR DIVIDED ROADWAYS



GENERAL NOTES

1- REFER TO RSD. 1101.11, SHEETS 1 & 4, FOR "L" DISTANCE AND SIGN SPACING.

2- INSTALL LANE CLOSURES WITH THE TRAFFIC FLOW, BEGINNING WITH DEVICES ON THE UPSTREAM SIDE OF TRAFFIC.

3- REMOVE LANE CLOSURES AGAINST THE TRAFFIC FLOW, BEGINNING WITH DEVICES ON THE DOWNSTREAM SIDE OF TRAFFIC.

4- FOR POSTED SPEED LIMITS BELOW 45 MPH, CHANNELIZING DEVICE SPACING SHALL BE 40 FEET IN THE TANGENTS. FOR POSTED SPEED LIMITS GREATER THAN OR EQUAL TO 45 MPH, CHANNELIZING DEVICE SPACING SHALL BE 80 FEET IN THE TANGENTS.

5- EXTEND LANE CLOSURES AT THE BUFFER SPACE SUCH THAT STOPPING SIGHT DISTANCE IS PROVIDED TO THE SIGNAL (REFER TO RSD 1101.11, SHEET 2).

6- DRUMS OR SKINNY DRUMS MAY BE USED IN LIEU OF CONES. REFER TO RSD 1180.01 FOR SKINNY DRUM REQUIREMENTS.

7- REFER TO THE CURRENT MUTCD FOR REQUIREMENTS AND PROCEDURES.

8- DO NOT EXCEED A 1 MILE LANE CLOSURE LENGTH UNLESS OTHERWISE SHOWN IN THE TMP OR AS DIRECTED BY THE ENGINEER.

9- DO NOT PLACE TEMPORARY SIGNALS IN LOCATIONS SUCH THAT VEHICLE QUEUES WILL REACH WITHIN 100' OF EITHER SIDE OF ACTIVE RAILROAD TRACKS OR ANOTHER SIGNALIZED INTERSECTION.

10- INTERSECTIONS AND DRIVEWAYS LOCATED WITHIN THE ONE-LANE OPERATION WILL REQUIRE ADDITIONAL SIGNALIZATION.

11- ALLOW ADEQUATE ROOM FOR ROAD USERS TO RETURN TO THEIR NORMAL DRIVING PATH.

12- STOP BARS REQUIRED FOR OPERATIONS OCCUPYING A SINGLE LOCATION FOR MORE THAN ONE DAYLIGHT PERIOD.

13- THIS DETAIL IS APPLICABLE FOR OPERATIONS IN PLACE FOR 72 HOURS OR LESS. FOR LONGER DURATION OPERATIONS, SIGNING AND PAVEMENT MARKINGS MAY NEED TO BE ALTERED.

LEGEND

- PORTABLE SIGN
- DIRECTION OF TRAFFIC FLOW
- PORTABLE SIGNAL
- CONE

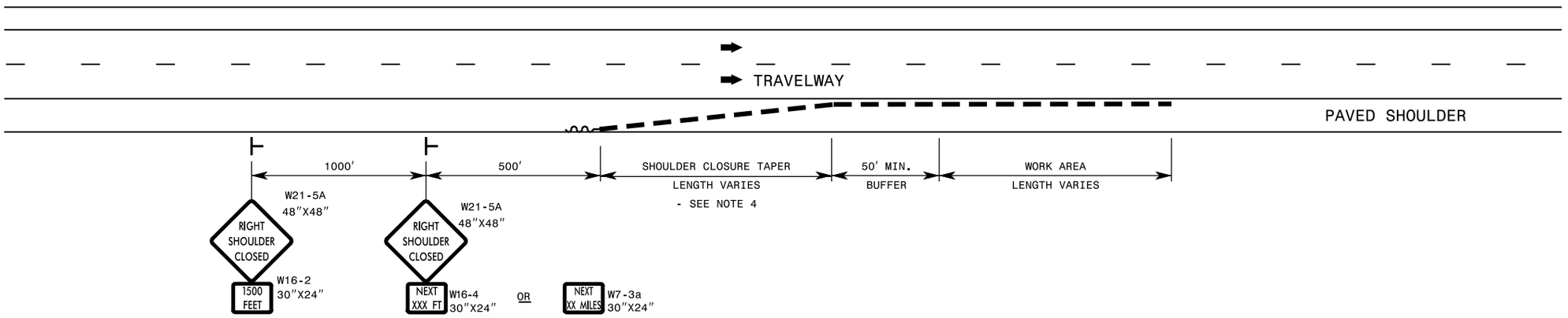
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RALEIGH, N.C.

ROADWAY STANDARD DRAWING FOR

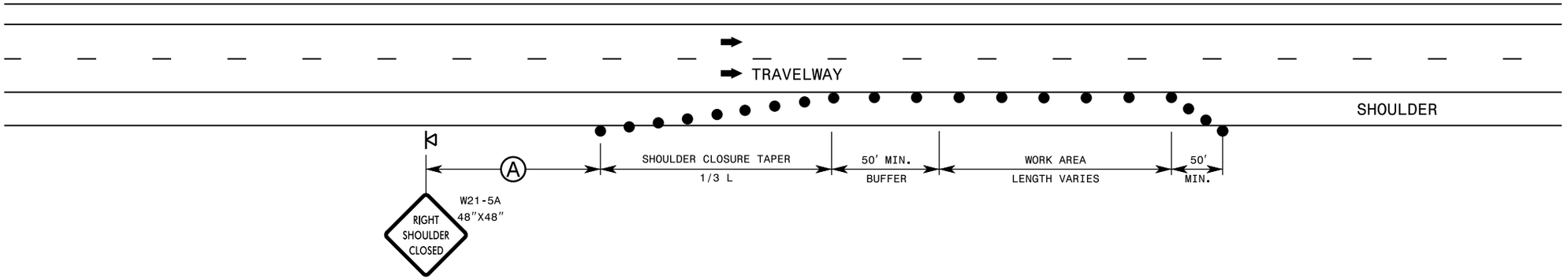
TEMPORARY LANE CLOSURES

2-LANE, 2-WAY ROADWAY-1 LANE CLOSED
PORTABLE TEMPORARY SIGNALS

SHOULDER CLOSURE ON DIVIDED FACILITIES USING BARRIER



SHOULDER CLOSURE ON DIVIDED FACILITIES USING CHANNELIZING DEVICES



GENERAL NOTES

1- PLACE SHOULDER CLOSURE SIGNS ON THE SAME SIDE AS THE SHOULDER THAT IS CLOSED.

2- PLACE DRUMS IN THE SHOULDER TAPER AT THE MAXIMUM SPACING EQUAL IN FEET TO THE POSTED SPEED LIMIT. THE MAXIMUM SPACING OF DRUMS ALONG THE WORK AREA IS EQUAL IN FEET TO 2 TIMES THE POSTED SPEED LIMIT.

3- USE STATIONARY SIGNS FOR OPERATIONS IN EFFECT LONGER THAN 72 HOURS.

4- REFER TO RSD. 1101.11, SHEETS 1, 3 & 4, FOR "L" DISTANCE, BARRIER FLARE RATES, AND SIGN SPACING.

LEGEND

- DRUM
- STATIONARY SIGN
- PORTABLE SIGN
- PORTABLE CONCRETE BARRIER
- DIRECTION OF TRAFFIC FLOW
- TEMPORARY CRASH CUSHION

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RALEIGH, N.C.

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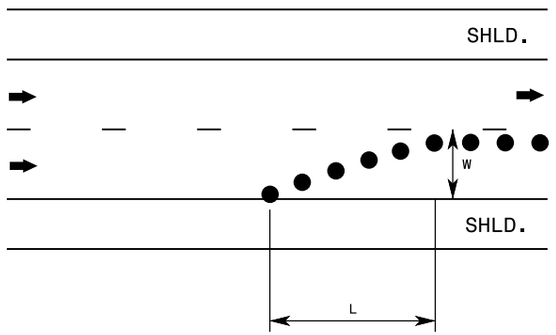
ROADWAY STANDARD DRAWING FOR

TEMPORARY SHOULDER CLOSURES

SHEET 1 OF 2

1101.04

EXAMPLE OF "L" & "W" DESIGNATIONS



TAPER LENGTH CRITERIA FOR CHANNELIZING DEVICES IN WORK ZONES

TYPES OF TAPERS	TAPER LENGTH
UPSTREAM TAPER	
MERGING TAPER	L MINIMUM
SHIFTING TAPER	½ L MINIMUM *
SHOULDER TAPER	⅓ L MINIMUM
TWO-WAY TRAFFIC TAPER	50 - 100 FEET MAXIMUM
DOWNSTREAM TAPER	100 FEET MAXIMUM

DO NOT INTRODUCE A MERGING OR SHIFTING TAPER WITHIN A CURVE OF THE ROADWAY

*USE FULL L FOR CONTROLLED-ACCESS FACILITIES UNLESS RESTRICTED BY FIELD CONDITIONS AS DETERMINED BY THE TRAFFIC CONTROL SUPERVISOR OR THE ENGINEER.

QUICK REFERENCE - "L" DISTANCE TABLE

MINIMUM LONGITUDINAL DISTANCE "L" (FEET) (ROUNDED VALUES)

POSTED SPEED "S" (MPH)	LATERAL WIDTH "W" (FEET)											
	1	2	3	4	5	6	7	8	9	10	11	12
20	10	15	20	30	35	40	50	55	60	70	75	80
25	15	25	35	45	55	65	75	85	95	105	115	125
30	15	30	45	60	75	90	105	120	135	150	165	180
35	25	45	65	85	105	125	145	165	185	205	225	245
40	30	55	80	110	135	160	190	215	240	270	295	320
45	45	90	135	180	225	270	315	360	405	450	495	540
50	50	100	150	200	250	300	350	400	450	500	550	600
55	55	110	165	220	275	330	385	440	495	550	605	660
60	60	120	180	240	300	360	420	480	540	600	660	720
65	65	130	195	260	325	390	455	520	585	650	715	780
70	70	140	210	280	350	420	490	560	630	700	770	840

GENERAL NOTES

1- TABLE FOR "L" DISTANCE IS BASED ON CHANNELIZATION TAPER FORMULA FROM THE MUTCD.
WHERE:

SPEED LIMIT	FORMULA
40 MPH OR LESS	$L_{MIN} = \frac{W \times S^2}{60}$
45 MPH OR GREATER	$L_{MIN} = W \times S$

L = MINIMUM TAPER LENGTH IN FEET (LONGITUDINAL DISTANCE)
W = WIDTH OF OFFSET IN FEET (LATERAL DISTANCE)
S = EXISTING POSTED SPEED LIMIT PRIOR TO THE IMPLEMENTATION OF A WORK ZONE SPEED LIMIT REDUCTION

2- "L" DISTANCE IS FOR APPLICATION WITH CHANNELIZING DEVICE AND PAVEMENT MARKING TAPERS AND TRANSITIONS. CHANNELIZING DEVICES INCLUDE DRUMS, CONES, TUBULAR MARKERS, BARRICADES, RAISED ASPHALT ISLANDS, AND VERTICAL PANELS.

STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

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ROADWAY STANDARD DRAWING FOR

TRAFFIC CONTROL DESIGN TABLES

"L" DISTANCE AND CHANNELIZING DEVICE TAPER CRITERIA

DESIGN SPEED (MPH)	MINIMUM SIGHT DISTANCE	MINIMUM LONGITUDINAL BUFFER SPACE (FEET)
	STOPPING SIGHT DISTANCE (FEET)	
30	200	85
35	250	120
40	305	155
45	360	195
50	425	240
55	495	290
60	570	345
65	645	405
70	730	470
75	820	540
80	910	615

GENERAL NOTES

1- TABLES ARE BASED ON THE AASHTO GREEN BOOK "A POLICY ON GEOMETRIC DESIGN OF HIGHWAYS AND STREETS" AND THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES". MINIMUM SIGHT DISTANCE VALUES ARE FOR PASSENGER CAR VEHICLES ON WET AND LEVEL ROADWAYS. CONSULT THE AASHTO GREEN BOOK TO MAKE FINAL DETERMINATION OF STOPPING SIGHT DISTANCE REQUIREMENTS.

2- BUFFER SPACE TABLE IS BASED ON THE BRAKING DISTANCE PORTION OF STOPPING SIGHT DISTANCE FOR WET AND LEVEL PAVEMENTS.

3- USE OF STOPPING SIGHT DISTANCE IN TRAFFIC CONTROL PLAN APPLICATIONS INCLUDES PROVIDING SIGHT DISTANCE FOR TRAFFIC APPROACHING A LANE CLOSURE. PROVIDE 2-LANE, 2-WAY ROADWAYS STOPPING SIGHT DISTANCE TO THE FLAGGER. FOR LANE CLOSURES ON MULTILANE ROADWAYS PROVIDE STOPPING SIGHT DISTANCE TO THE BEGINNING OF THE LANE CLOSURE MERGE TAPER, OR FLASHING ARROW BOARD. EXTEND LANE CLOSURES AT THE BUFFER SPACE SUCH THAT STOPPING SIGHT DISTANCE IS PROVIDED.

STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

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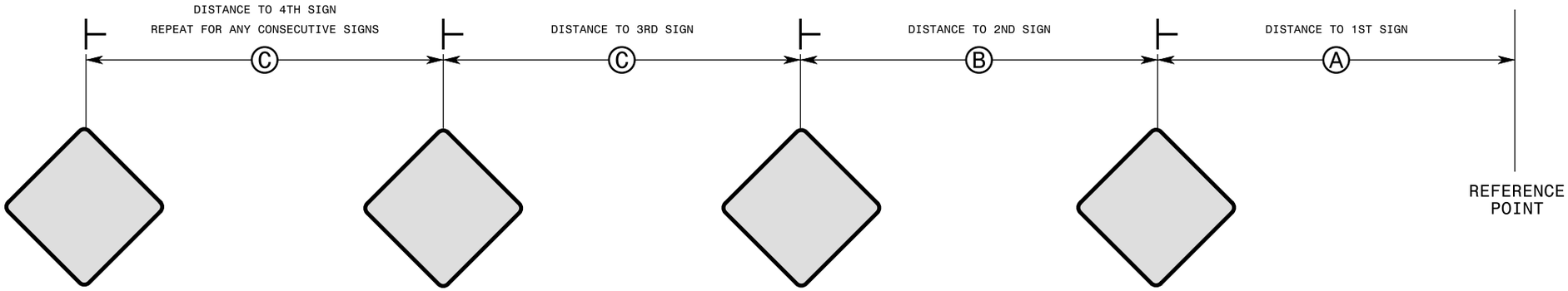
ROADWAY STANDARD DRAWING FOR

TRAFFIC CONTROL DESIGN TABLES

BUFFER SPACE & SIGHT DISTANCE

ADVANCE WARNING SIGN SPACING CHART			
POSTED SPEED LIMIT (MPH)	RECOMMENDED DISTANCE BETWEEN SIGNS (FEET)±		
	Ⓐ	Ⓑ	Ⓒ
≤ 35	200	200	200
40-50	350	350	350
55	500	500	500
CONTROLLED ACCESS ROADS (≥ 55)	1000	1500	2700

STATIONARY OR PORTABLE SIGNS



GENERAL NOTES

1- REFER TO THE LATEST EDITION OF THE MUTCD.

2- USE THIS STANDARD DRAWING IN CONJUNCTION WITH OTHER TRAFFIC CONTROL ROADWAY STANDARD DRAWINGS WHERE SIGN SPACING DISTANCES A, B, C, ARE SPECIFIED.

3- APPLY THE ADVANCE WARNING SIGN SPACING CHART WHERE A SERIES OF 2 OR MORE SIGNS ARE USED. ALL SIGN SPACING DIMENSIONS ARE APPROXIMATE. FIELD ADJUST AS VARIOUS CONDITIONS OCCUR, SUCH AS LIMITED SIGHT DISTANCE, OBSTRUCTION INTERFERENCE, ETC.

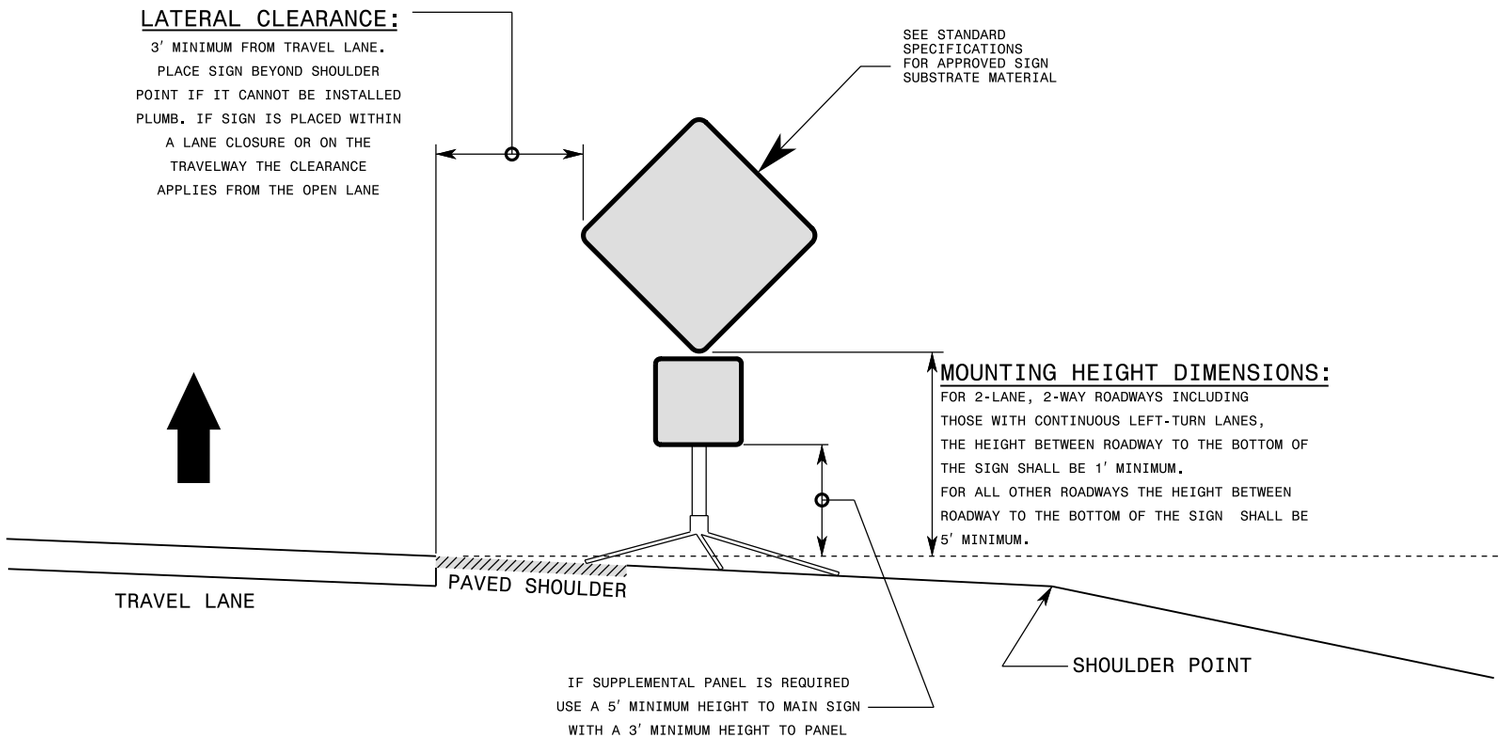
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ROADWAY STANDARD DRAWING FOR

TRAFFIC CONTROL DESIGN TABLES

SPACING OF TEMPORARY SIGNS IN SERIES



GENERAL NOTES

1- DIMENSIONS SHOWN ARE MINIMUM VALUES. MOUNT SIGNS SO THEY WILL BE CLEARLY VISIBLE TO APPROACHING TRAFFIC EVEN WHEN SIGNS ARE MOUNTED BEHIND TRAFFIC CONTROL DEVICES SUCH AS DRUMS, BARRIER, OR OTHER OBJECTS.

2- USE PORTABLE WORK ZONE SIGNS AND STANDS SPECIFICALLY DESIGNED FOR ONE ANOTHER.

3- ALL PORTABLE WORK ZONE SIGNS AND STANDS MUST BE LISTED ON THE DEPARTMENT'S APPROVED PRODUCTS LIST.

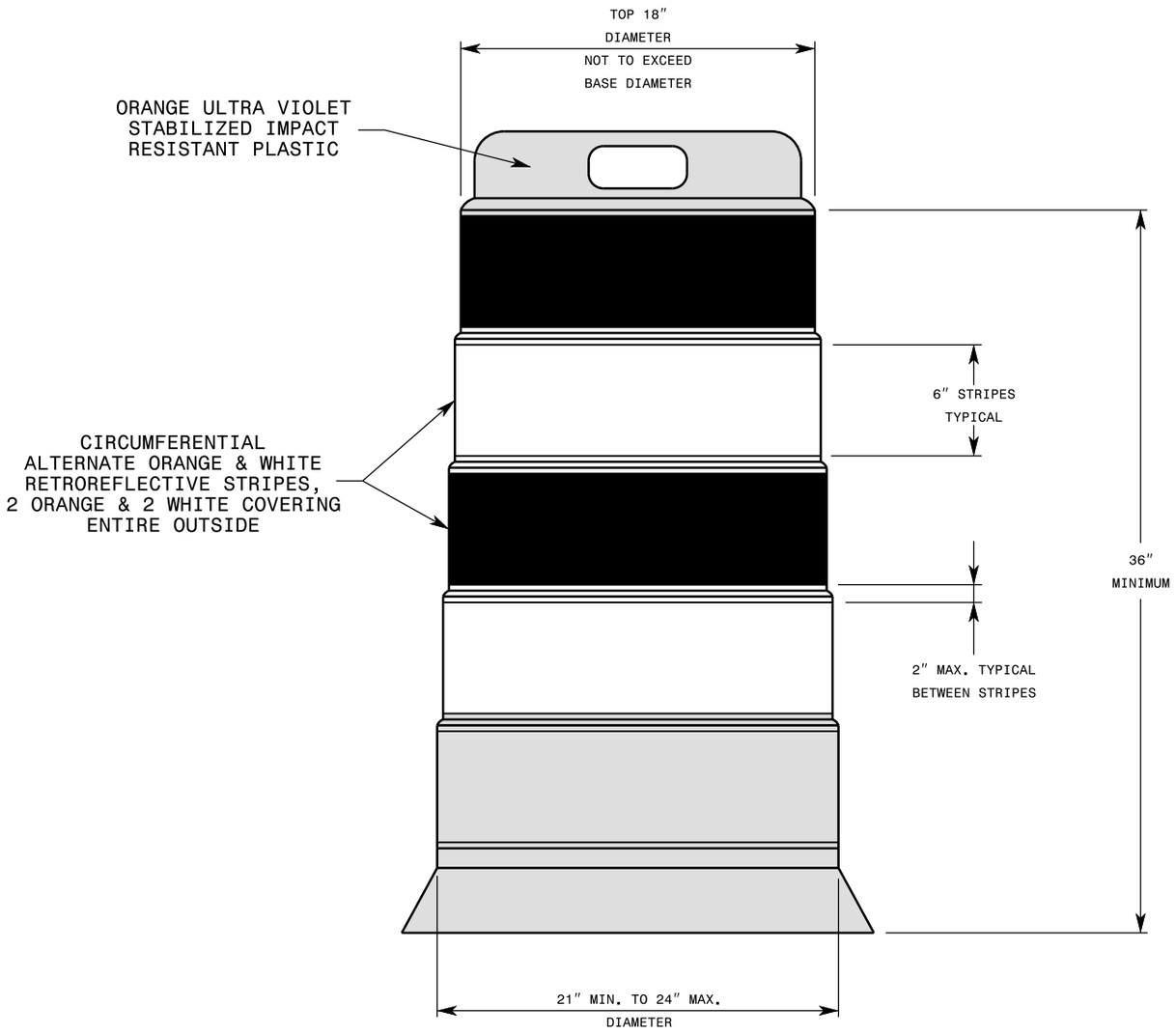
STATE OF
NORTH CAROLINA
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DIVISION OF HIGHWAYS
RALEIGH, N.C.

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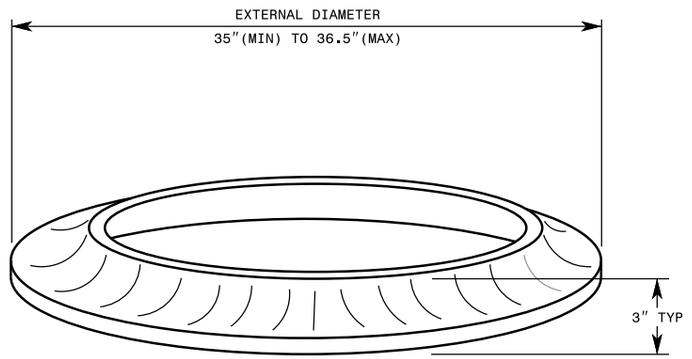
ROADWAY STANDARD DRAWING FOR

PORTABLE WORK ZONE SIGNS

MOUNTING HEIGHT & LATERAL CLEARANCE



TIRE BALLAST



ALL RUBBER COLLARS MUST BE BLACK IN COLOR AND FREE OF ANY COLORED PAINT

BALLAST COLLAR SHOULD HAVE GOOD CONTACT WITH THE BARREL FLANGE AND BALLAST OUTER EDGE MUST LAY FLAT WITH ROAD SURFACE

DRUMS THAT USE TIRE BALLASTS ARE MANUFACTURED SPECIFICALLY FOR THAT PURPOSE. DO NOT USE TIRE BALLASTS WITH OTHER DRUM DESIGNS.

GENERAL NOTES

1- BALLASTING SHALL BE ACHIEVED BY THE SAND BAG, TIRE-SIDEWALL, OR PREFORMED WEIGHTED BASE METHODS. USE THE TIRE BALLAST AS SPECIFIED BY THE MANUFACTURER. DO NOT PLACE BALLAST ON TOP OF THE DRUM.

2- IF NECESSARY PLACE THE NAME OF THE AGENCY, CONTRACTOR, OR SUPPLIER ON NON-RETROREFLECTIVE DRUM SURFACES. SHOW THE LETTERS AND NUMBERS USING A NON-RETROREFLECTIVE COLOR AND NOT OVER 2″ IN HEIGHT.

3- ALL DRUMS MUST BE LISTED ON THE DEPARTMENT'S APPROVED PRODUCT LIST.

4- REFER TO THE STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES FOR ADDITIONAL INFORMATION.

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ROADWAY STANDARD DRAWING FOR

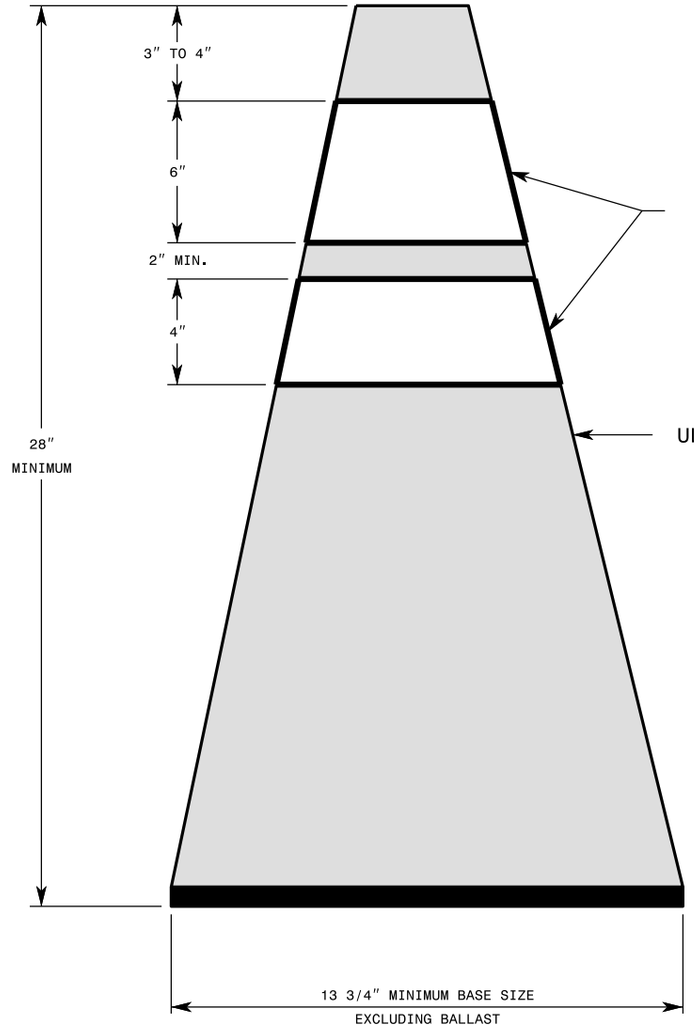
DRUMS

SHEET 1 OF 1

1130.01

28 INCH CONE

(MINIMUM SIZE CONE FOR ALL CLASSES OF ROADS EXCEPT FREEWAYS AND INTERSTATES)

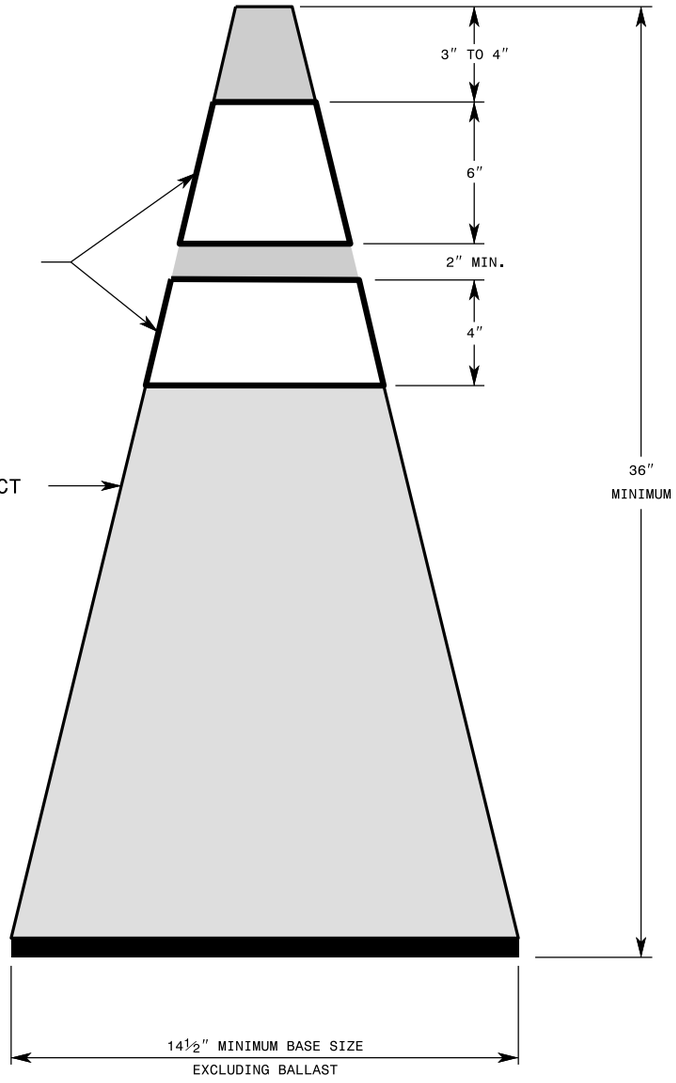


WHITE RETROREFLECTIVE ADHESIVE SHEETING REQUIRED BETWEEN DUSK AND DAWN

ORANGE ULTRA-VIOLET STABILIZED IMPACT RESISTANT PLASTIC

36 INCH CONE

(REQUIRED FOR FREEWAYS AND INTERSTATES)



GENERAL NOTES

1- ACHIEVE BALLASTING BY USING SPECIAL WEIGHTED BASES SUCH AS SAND BAG RINGS, DOUBLING CONES, OR BASES THAT CAN BE FILLED WITH BALLAST. SEVENTY PERCENT OF THE WEIGHT OF THE CONE MUST BE IN THE BASE. USE BALLAST'S THAT DO NOT PRESENT A HAZARD WHEN STRUCK.

2- ALL CONES MUST BE LISTED ON THE DEPARTMENT'S APPROVED PRODUCTS LIST.

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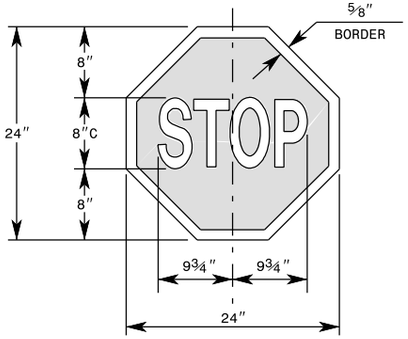
ROADWAY STANDARD DRAWING FOR

CONES

SHEET 1 OF 1

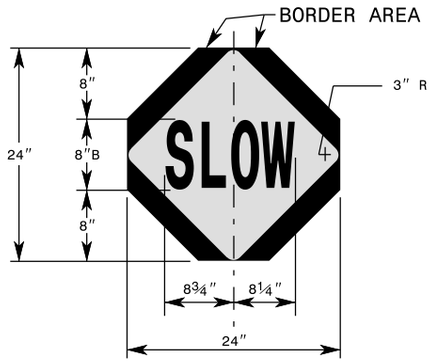
1135.01

STOP/SLOW PADDLE



STOP:

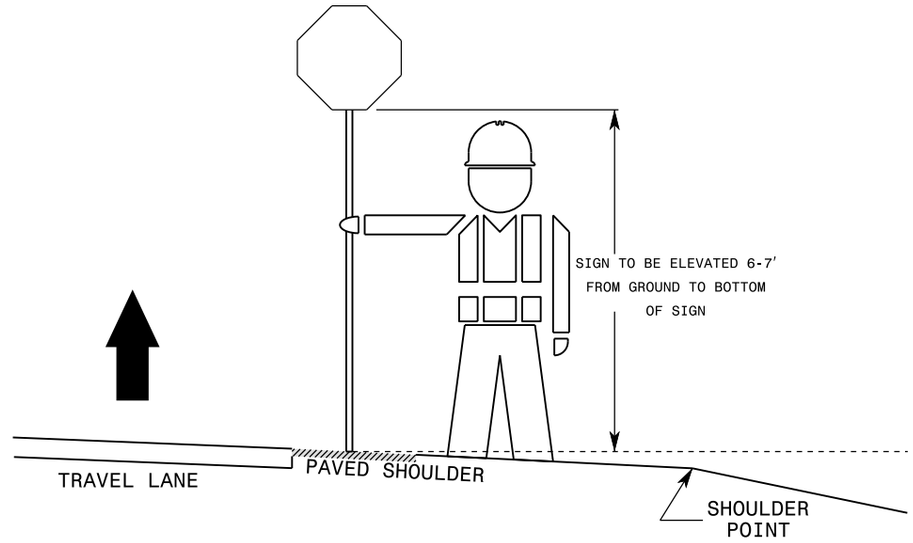
LEGEND-WHITE REFLECTORIZED
BORDER-WHITE REFLECTORIZED
BACKGROUND-RED REFLECTORIZED



SLOW:

LEGEND-BLACK REFLECTORIZED
BORDER AREA-BLACK REFLECTORIZED
BACKGROUND-ORANGE REFLECTORIZED

FLAGGER AND PADDLE PLACEMENT



GENERAL NOTES

1- USE HAND SIGNALING DEVICES SUCH AS STOP-SLOW PADDLES, FLASHLIGHTS TO CONTROL TRAFFIC. USE STOP-SLOW PADDLES AS THE PRIMARY DEVICE.

2- FABRICATE STOP-SLOW PADDLES FROM SHEET METAL OR OTHER LIGHT SEMI RIGID MATERIAL. PROVIDE A RIGID HANDLE OF SUFFICIENT LENGTH SO THE PADDLE IS HELD AT 6-7' ABOVE GROUND LEVEL.

3- PROVIDE STOPPING SIGHT DISTANCE TO EACH FLAGGER STATION. REFER TO RSD. 1101.11, SHEET 2.

4- ILLUMINATE FLAGGER STATIONS DURING NIGHT OPERATIONS.

5- FOLLOW FLAGGER QUALIFICATIONS AND METHODS OF HAND-SIGNALING PROCEDURES IN ACCORDANCE WITH PART VI OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.

6- ALL FLAGGERS MUST BE CERTIFIED BY AN NCDOT APPROVED TRAINING RESOURCE.

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ROADWAY STANDARD DRAWING FOR

FLAGGERS

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

JOSH STEIN
GOVERNOR

J.R. "JOEY" HOPKINS
SECRETARY

May 27, 2025

COUNTY: Randolph

SUBJECT: Encroachment Contract E081-076-24-0700 – Piedmont Triad Regional Water Authority (PTRWA)

Gregory Flory
Executive Director
Piedmont Triad Regional Water Authority (PTRWA)
7297 Adams Farm Rd
Randleman, NC 27317

Dear Gregory Flory:

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 346LF of DIP waterline, with 270LF encased in 275LF of steel encasement installed by jack and bore, and 76LF installed by open-cut, and one temporary construction entrance along/across I-74 & SR-1511 (Heath Dairy Rd) in/near Randleman

APPROVED SUBJECT TO: Attached Special Provisions.

Sincerely,

Keith Garry
State Utilities Manager

DocuSigned by:
Vang Moua
829A885424B34F1...

Vang Moua for
Larry D. Sanders, MGIST, PE, CPM
State Encroachments Engineer

LDS/scn
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-1
1000 BIRCH RIDGE DRIVE
RALEIGH NC 27610

SPECIAL PROVISIONS
R/W 16.2
Piedmont Triad Regional Water Authority
E081-076-24-00700

1. Approval may be rescinded upon failure to follow any of the provisions in this permit and may be considered a violation of the encroachment agreement.

2. The Encroaching party or their contractor shall provide the following notices prior to construction activity within the NCDOT Right of Way:
    a. Three (3) business days advance phone call at telephone (336) 318-4003 or email to rjmonnroe@ncdot.gov to the District Engineer's office

   Failure to provide these notifications prior to beginning construction is subject to the Division Engineer's discretion to cease construction activity for this encroachment. NCDOT reserves the right to cease any construction or maintenance work associated with this installation by the encroaching party until the construction or maintenance meets the satisfaction of the Division Engineer or their representative.

3. Prior to beginning work, it is the requirement of the Encroaching Party to contact the appropriate Utility Companies involved and make arrangements to adjust or relocate any utilities that conflict with the proposed work.

4. It shall be the responsibility of the encroaching party to determine the location of utilities within the encroachment area. NCGS § 87-115 through § 87-130 of the Underground Utility Safety and Damage Prevention Act requires underground utilities to be located by calling 811 prior to construction. The encroaching party shall be responsible for notifying other utility owners and providing protection and safeguards to prevent damage or interruption to existing facilities and maintain access to them.

5. The encroaching party shall notify the appropriate municipal office prior to beginning any work within the municipality's limits of jurisdiction.

6. At the option of the District Engineer, a preconstruction meeting including representatives of NCDOT, the encroaching party, contractors and municipality, if applicable, shall be required. A preconstruction conference held between a municipality (or other facility owner) and a contractor without the presence of NCDOT personnel with subsequent construction commencing may be subject to NCDOT personnel ceasing any work on NCDOT right-of-way related to this encroachment until such meeting is held. Contact the District office to schedule.

7. At the discretion of the District Engineer, a NOTIFICATION FOR UTILITY / NON-UTILITY ENCROACHMENT WITHIN NCDOT R/W form (See corresponding attachment) with the scheduled preconstruction meeting and associated construction schedule details must be completed and submitted to the District Engineer's office a minimum of one week prior to construction.

8. At the discretion of the District Engineer, the encroaching party (not the utility contractor) shall make arrangements to have a qualified inspector, under the supervision of a Professional Engineer registered in North Carolina, on site at all times during construction. The registered Professional Engineer shall be required to submit a signed and PE sealed certification that the utility was installed in accordance with the encroachment agreement.

9. This approval and associated plans and supporting documents shall not be interpreted to allow any design change or change in the intent of the design by the Owner, Design Engineer, or any of their representatives. Any revisions or changes to these approved plans or intent for construction must be obtained in writing from the Division Engineer's office or their representative prior to construction or during construction if an issue arises during construction to warrant changes.

10. 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. It is the responsibility of the encroaching party to verify the right of way.

11. Encroaching party shall be responsible for obtaining all necessary permanent and/or temporary construction, drainage, utility and/or sight distance easements.

12. All Right of Way and easements necessary for construction and maintenance shall be dedicated to NCDOT with proof of dedication furnished to the District Engineer prior to beginning work.

13. Traffic control shall be coordinated with the District Engineer and the Division Traffic Engineer, Mr. Zachary Hussey at telephone (910) 947-3930, prior to construction.

14. 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 involved with the installation of Work Zone Traffic Control devices inside the highway right of way are required to be qualified and trained Work Zone Installers. 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 and by private entities that have been pre-approved to train themselves.

    For questions and/or additional information regarding this training program please refer to https://connect.ncdot.gov/projects/WZTC/Pages/Training.aspx or call the NCDOT Work Zone Traffic Control Section (919) 814-5000.

15. The party of the second part shall employ traffic control measures that are in accordance with the prevailing federal, state, local, and NCDOT policies, standards, and procedures. These policies, standards, and procedures include, but are not limited to the following:
    a. Manual on Uniform Traffic Control Devices (MUTCD) – North Carolina has adopted the MUTCD to provide basic principles and guidelines for traffic control device design, application, installation, and maintenance. North Carolina uses the MUTCD as a minimum requirement where higher supplemental standards specific to North Carolina are not

established. Use fundamental principles and best practices of MUTCD (Part 6, Temporary Traffic Control).

b. NCDOT Maintenance / Utility Traffic Control Guidelines – This document enhances the fundamental principles and best practices established in MUTCD Part 6, Temporary Traffic Control, incorporating NCDOT-specific standards and details. It also covers important safety knowledge for a wide range of work zone job responsibilities.

16. Ingress and egress shall be maintained to all businesses and dwellings affected by the construction of this encroachment. Special attention shall be paid to police, EMS and fire stations, fire hydrants, secondary schools, and hospitals.

17. Traffic shall be maintained at all times. All lanes of traffic are to be open during the hours of 7:00 A.M. to 9:00 A.M. and from 4:00 P.M. to 6:00 P.M. Monday through Friday, during any time of inclement weather, **or as directed by the District Engineer**. If the location of work calls for a rolling roadblock on Interstates and divided highway US routes, the restriction is to work only on Sunday from 1:00 A.M. to 10:00 A.M, **or as Directed by the District Engineer**. Any violation of these hours will result in ceasing any further construction by the Encroaching Party or their contractor.

18. Nighttime and weekend operations will NOT be allowed unless written approval is received from the District Engineer. If nighttime or weekend work is allowed or required, all signs must be retro-reflective, and a work zone lighting plan must be submitted for approval prior to construction.

19. Two-way traffic shall be maintained at all times unless designated by the District Engineer. Traffic shall not be rerouted or detoured without the prior written approval from the District Engineer. No utility work will be allowed on state holidays from 7:00 PM the night before through 9:00 AM the day prior to, following or during local events without prior approval from the District Engineer. If the construction is within 1000 feet of a school location or on a designated bus route, the construction shall be coordinated with the school start and end times to avoid traffic delays.

20. Any work requiring equipment or personnel within 5 feet of the edge of any travel lane of an undivided facility and within 10 feet of the edge of any travel lane of a divided facility shall require a lane closure with appropriate tapers per current *NCDOT Roadway Standard Drawings or MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES*.

21. At the discretion of the District Engineer, a traffic control plan shall be developed and submitted under the seal and signature of a Licensed North Carolina Professional Engineer prior to construction. The plan shall be specific to the site and adequately detailed. Issues such as the close proximity to intersections shall be addressed.

22. Any pavement markings that are damaged or obliterated shall be restored by the encroaching party at no expense to NCDOT.

23. 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. Additional information can be obtained by contacting the NCDOT Roadside Environmental Engineer regarding the North Carolina Natural Heritage Program or the United States Fish and Wildlife Services. Contact the Division Roadside Environmental Engineer's Office at (910) 773-8000.

24. All erosion control devices and measures shall be constructed, installed, maintained, and removed by the Encroacher in accordance with all applicable Federal, State, and Local laws, regulations, ordinances, and policies. Permanent vegetation shall be established on all disturbed areas in accordance with the recommendations of the Division Roadside Environmental Engineer. All areas disturbed (shoulders, ditches, removed accesses, etc.) shall be graded and seeded in accordance with the latest *NCDOT Standards Specifications for Roads and Structures* and within 15 calendar days with an approved NCDOT seed mixture (all lawn type areas shall be maintained and reseeded as such). Seeding rates per acre shall be applied according to the Division Roadside Environmental Engineer. Any plant or vegetation in the NCDOT planted sites that is destroyed or damaged as a result of this encroachment shall be replaced with plants of like kind or similar shape.

25. No trees within NCDOT right of way shall be cut without authorization from the Division Roadside Environmental Engineer. An inventory of trees measuring greater than 4 caliper inches (measured 6" above the ground) is required when trees within C/A right of way will be impacted by the encroachment installation. Mitigation is required and will be determined by the Division Roadside Environmental Engineer's Office.

26. Prior to installation, the Encroaching Party shall contact the District Engineer to discuss any environmental issues associated with the installation to address concerns related to the root system of trees impacted by boring or non-utility construction of sidewalk, roadway widening, etc.

27. The Encroaching Party is responsible for identifying project impacts to waters of the United States (wetlands, intermittent streams, perennial streams and ponds) located within the NCDOT right-of-way. The discharge of dredged or fill material into waters of the United States requires authorization from the United States Army Corps of Engineers (USACE) and certification from the North Carolina Division of Water Quality (NCDWQ). The applicant is required to obtain pertinent permits or certification from these regulatory agencies if construction of the project impacts waters of the United States within the NCDOT right-of-way. The applicant is responsible for complying with any river or stream Riparian Buffer Rule as regulated by the NCDWQ. The Rule regulates activity within a 50-foot buffer along perennial streams, intermittent streams and ponds. Additional information can be obtained by contacting the NCDWQ or the USACE.

28. The contractor shall not begin the construction until after the traffic control and erosion control devices have been installed to the satisfaction of the Division Engineer or their agent.

29. The contractor shall perform all monitoring and record keeping and any required maintenance of erosion and sediment control measures to maintain compliance with stormwater regulations.

30. No access to the job site, parking or material storage shall be allowed along or from any **Controlled Access Roadway.**

31. The installation within the Control of Access fence shall not adversely affect the design, construction, maintenance, stability, traffic safety or operation of the controlled access highway, and the utility must be serviced without access from the through-traffic roadways or ramps.

32. The resetting of the Control of Access fence shall be in accordance with the applicable NCDOT standard and as directed by the Division Engineer or their representative.

33. State Transportation Improvement Project (STIP) HI-0004 is scheduled for future construction. Any encroachment determined to be in conflict with the construction of this NCDOT project shall be removed and/or relocated at the encroaching party's expense.

34. An executed copy of the encroachment agreement, provisions and approved plans shall be present at the construction site at all times. 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.

35. If the approved method of construction is unsuccessful and other means are required, prior approval must be obtained through the District Engineer before construction may continue.

36. All disturbed areas are to be fully restored to current NCDOT minimum roadway standards or as directed by the Division Engineer or their representative. Disturbed areas within NCDOT Right-of-Way include, but not limited to, any excavation areas, pavement removal, drainage or other features.

37. The encroaching party shall notify the Division Engineer or their representative immediately in the event any drainage structure is blocked, disturbed or damaged. All drainage structures disturbed, damaged or blocked shall be restored to its original condition as directed by the Division Engineer or their representative.

38. A minimum of 5 feet clearance is required for utility installations beneath or near drainage pipes, headwalls, and a minimum of two-foot clearance below the flowline of streams. If directional drilling, a minimum ten-foot clearance distance is required from drainage structures and a minimum of 5 feet below flowline of streams.

39. At points where the utility is placed under existing storm drainage, the trench will be backfilled with excavatable flowable fill up to the outside diameter of the existing pipe.

40. Unless specified otherwise, during non-working hours, equipment shall be located away from the job site or 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 Zone. Also, during non-working hours, no parking or material storage shall be allowed along the shoulders of any state-maintained roadway.

41. The Encroaching Party and/or their Contractor shall comply with all OSHA requirements. If OSHA visits the work area associated with this encroachment, the District Office shall be notified by the encroaching party immediately if any violations are cited.

42. Any guardrail removed or damaged during construction shall be replaced or repaired to its original condition, meeting current NCDOT standards or as directed by the Division Engineer or their representative.

43. Right of Way monuments disturbed during construction shall be referenced by a registered Land Surveyor and reset after construction.

44. All Traffic signs moved during construction shall be reinstalled as soon as possible to the satisfaction of the Division Engineer or their representative.

45. Detection tape, where required by NCGS § 87-115 through § 87-130 of the Underground Utility Safety and Damage Prevention Act, shall be buried in the trench approximately 1 foot above the installed facility. Where conduit is installed in the right of way and is not of ferrous material, locating tape or detection wire shall be installed with the conduit.

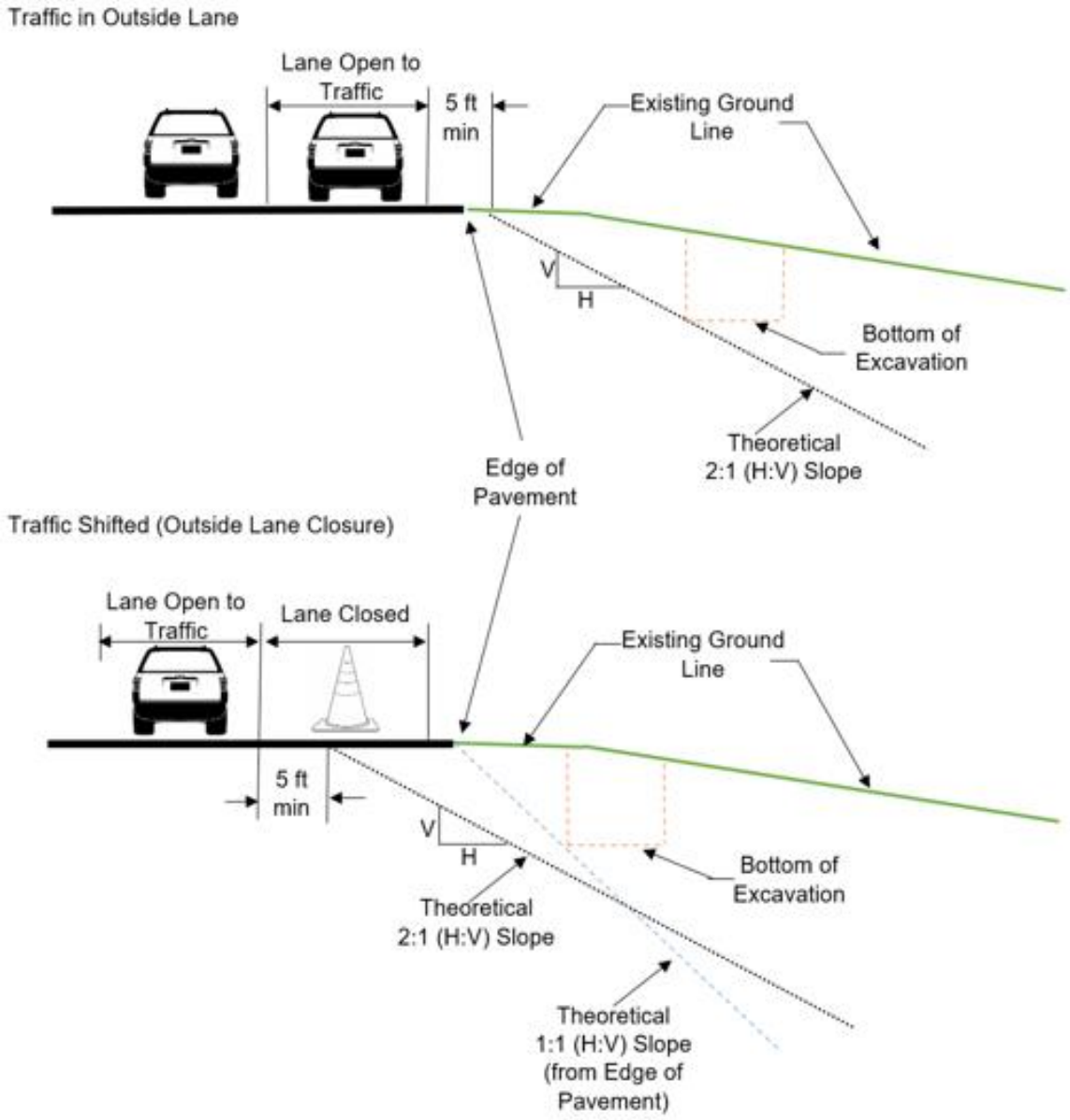
46. All driveways disturbed during construction shall be returned to a state comparable with the condition of the driveways prior to construction.

47. All traffic control, asphalt mixes, structures, construction, workmanship and construction methods, and materials shall be in compliance with the most-recent versions of the following resources: *ASTM Standards, Manual on Uniform Traffic Control Devices, NCDOT Utilities Accommodations Manual, NCDOT Standard Specifications for Roads and Structures, NCDOT Roadway Standard Drawings,* NCDOT *Asphalt Quality Management System* manual, **and the approved plans.**

48. Excavation material shall not be placed on pavement.

49. It is the responsibility of the encroaching party or their contractor to prevent any mud/dirt from tracking onto the roadway. Any dirt which may collect on the roadway pavement from equipment and/or truck traffic on site shall be immediately removed to avoid any unsafe traffic conditions.

50. The utility shall be installed within 5 feet of (or as close as practical to) the right of way line and outside the 5-foot minimum from travel lane plus theoretical 2:1 slope from the edge of pavement to the bottom of the nearest excavation wall for temporary shoring. Temporary shoring is required when a theoretical 2:1 slope from the bottom of excavation will intersect the existing ground line less than 5 feet from the outside edge of an open travel lane as shown in the figure below or when a theoretical 2:1 slope from the bottom of excavation will intersect any existing structure, support, utility, property, etc. to be protected.



If the 2:1 slope plus 5 feet requirement above is met for traffic, then temporary shoring is typically only necessary to protect roadways from damage when a theoretical 1:1 slope from the edge of pavement intersects the nearest excavation wall. This rule of thumb should be used with caution and does not apply to all subsurface conditions, surcharge loadings and excavation geometries. Situations where this 1:1 slope is not recommended include groundwater depth is above bottom of excavation or excavation is deeper than 10 feet or in Type B or C soils as defined by OSHA Technical Manual. Temporary shoring may be avoided by locating trenches, bore pits, and other excavations far enough away from the open travel lane, edge of pavement and any existing structure, support, utility, property, etc. to be protected.

Temporary shoring shall be designed and constructed in accordance with current NCDOT Standard Temporary Shoring provisions (refer to

https://connect.ncdot.gov/resources/Specifications/Pages/2018-Specifications-and-Special-Provisions.aspx and see SP11 R002

a. Temporary 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. (See NCDOT *Utilities Accommodations Manual* for more information on requirements for shoring plans, design calculations, and subsurface investigation report.) **Trench boxes shall not be accepted as temporary shoring and will not be approved for use in instances where shoring is required to protect the highway, drainage structure, and/or supporting pavement or structure foundation**.
b. All trench excavation inside the limits of the theoretical two-to-one slope plus 5 feet requirement, 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. Any excavation that is not backfilled by the end of the workday must address any safety and traveling public concerns including accommodations for bicycles, pedestrians and persons with disabilities.
c. The trench backfill material shall meet the Statewide Borrow Criteria. The trench shall be backfilled in accordance with Section 300-7 of the latest *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 AASHTO T99 as modified by DOT.
d. At the discretion of the Division Engineer, 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.
e. The length of parallel excavation shall be limited to the length necessary to install and backfill one joint of pipe at a time, not to exceed twenty-five (25) feet.

51. 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. The option to backfill any trenches with dirt or either #57 stone or #78 stone with consolidation with a plate tamp and without a conventional density test may be pursued with the written consent of the District Engineer. If this option is exercised, then roadway ABC stone and asphalt repair as required will also be specified by the District Engineer.

52. Boring equipment will be provided of a type and size to facilitate boring in the local geologic conditions and shall be able to facilitate the encroachment work.

53. Any pavement damaged because of settlement of the pavement or damaged by equipment used to perform encroachment work, shall be re-surfaced to the satisfaction of the District Engineer. This may include the removal of pavement and a 50' mechanical overlay. All pavement work and pavement markings (temporary and final) are the responsibility of the Encroaching Party.

54. The Encroaching party shall notify the District Engineer's office within 2 business days after construction is complete. The District Engineer may perform a construction inspection. Any

deficiencies may be noted and reported to the encroaching party to make immediate repairs or resolve any issues to restore the right-of-way to a similar condition prior to construction, including pavement, signage, traffic signals, pavement markings, drainage, structures/pipes, or other highway design features.

55. At the discretion of the District Engineer, a final inspection report may be provided to the encroaching party upon satisfactory completion of the work.

56. If the actual construction differs from the approved plans associated with this encroachment, a copy of "as-built" plans shall be submitted to the District Engineer's office in a PDF format and in a current ESRI GIS format within 4 weeks of construction.

ROUTE I-74 STATE PROJECT Water Line PTRWA - Asheboro STATE OF NORTH CAROLINA
FEDERAL PROJECT COUNTY Randolph

DEPARTMENT OF TRANSPORTATION
-AND-
Piedmont Triad Regional Water Authority (PTRWA)

RIGHT OF WAY
ENCROACHMENT AGREEMENT
INTERSTATE AND OTHER CONTROLLED
ACCESS HIGHWAYS

THIS AGREEMENT, made and entered into this the 27th day of May , 20 25 , by and between the Department of Transportation, party of the first part; and Piedmont Triad Regional Water Authority (PTRWA) party of the second part,

W I T N E S S E T H

THAT WHEREAS, the party of the second part desires to encroach on the right of way of the public road designated as Route(s) I-74 , located in Randolph County at intersection of SR 1511 (Heath Dairy Rd) & I-74 with the construction and/or erection of: 346 LF of 16-inch DIP waterline, within R/W, with 270 LF being installed via Bore & Jack. Bore & Jack will be completed utilizing a 275' long, 36" diameter steel encasement. Work will include (1) temporary construction entrance located along SR-1511 in order to access the receiving pit.

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 UTILITIES ACCOMMODATIONS MANUAL, 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 Utilities Manager of the party of the first part.

That the said party of the second part hereby agrees that access for servicing its facilities will be limited to access via (a) frontage roads where provided, (b) nearby or adjacent public roads and street, or (c) trails along or near the highway right of way lines, connecting only to an intersecting road; from any one or all of which entry may be made to the outer portion of the highway right of way. The party of the second part's rights of access to the through-traffic roadways and ramps shall be subject to the same rules and regulations as apply to the general public, except if an emergency situation occurs, and the usual means of access for service operation as herein provided will not permit the immediate action required by the party of the second part in making emergency repairs as required for the safety and welfare of the public, the party of the second part shall have a temporary right of access to and from the through-traffic roadways and ramps as necessary to accomplish the required emergency repairs, provided that the party of the second part complies with the regulations established by the party of the first part for policing and control to protect the highway users.

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 installation or maintenance operation disturbs the ground surface and existing ground cover, the party of the second part agrees to remove and replace the sod or otherwise reestablish the grass cover to meet the satisfaction of the Division Engineer of the party of the first part.

That the party of the second part agrees to assume the actual cost of any inspection of the work considered to be necessary by the Division Engineer of the party of the first part.

That the party of the second part agrees to have available at the construction site, at all times during construction, a copy of this agreement showing evidence of approval by the party of the first part. The party of the first part reserves the right to stop all work unless evidence of approval can be shown.

Provided the work contained in this agreement is being performed on a completed highway open to traffic; the party of the second part agrees to give written notice to the Division Engineer of the party of the first part when all work contained herein has been completed. Unless specifically requested by the party of the first part, written notice of completion of work on highway projects under construction will not be required.

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 (162) : Party of the Second Part certifies that this agreement is true and accurate copy of the form R/W (162) 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.

DEPARTMENT OF TRANSPORTATION

Digitally signed by: for Vang Moua

BY: STATE UTILITIES MANAGER
DocuSigned by: 629A685424B34F1...
State Encroachments Engineer

Gregory Flory, PE

Executive Director - **PTRWA**

Second Party

ATTEST OR WITNESS:

Rebecca T. Brown

Rebecca T. Brown

Finance Director

APPLICATION IDENTIFICATION		N.C. DEPARTMENT OF TRANSPORTATION
Driveway Permit No.	Date of Application 11/7/24	STREET AND DRIVEWAY ACCESS PERMIT APPLICATION
County: Randolph		
Development Name: Water Line PTRWA - Asheboro		

LOCATION OF PROPERTY:

Route/Road: SR 1511 - Heath Dairy Rd

Exact Distance 110 ☐ Miles ☒ Feet N ☐ S ☒ E ☐ W ☐

From the Intersection of Route No. SR 1511 and Route No. SR 1512 Toward SR 1712

Property Will Be Used For: ☐ Residential /Subdivision ☐ Commercial ☐ Educational Facilities ☐ TND ☐ Emergency Services ☒ Other

Property: ☐ is ☒ is not within City of Randleman City Zoning Area.

AGREEMENT

- I, the undersigned property owner, request access and permission to construct driveway(s) or street(s) on public right-of-way at the above location.
- I agree to construct and maintain driveway(s) or street entrance(s) in absolute conformance with the current "Policy on Street and Driveway Access to North Carolina Highways" as adopted by the North Carolina Department of Transportation.
- I agree that no signs or objects will be placed on or over the public right-of-way other than those approved by NCDOT.
- I agree that the driveway(s) or street(s) will be constructed as shown on the attached plans.
- I agree that that driveway(s) or street(s) as used in this agreement include any approach tapers, storage lanes or speed change lanes as deemed necessary.
- I agree that if any future improvements to the roadway become necessary, the portion of driveway(s) or street(s) located on public right-of-way will be considered the property of the North Carolina Department of Transportation, and I will not be entitled to reimbursement or have any claim for present expenditures for driveway or street construction.
- I agree that this permit becomes void if construction of driveway(s) or street(s) is not completed within the time specified by the "Policy on Street and Driveway Access to North Carolina Highways".
- I agree to pay a $50 construction inspection fee. Make checks payable to NCDOT. This fee will be reimbursed if application is denied.
- I agree to construct and maintain the driveway(s) or street(s) in a safe manner so as not to interfere with or endanger the public travel.
- I agree to provide during and following construction proper signs, signal lights, flaggers and other warning devices for the protection of traffic in conformance with the current "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 District Engineer.
- I agree to indemnify and save harmless the North Carolina Department of Transportation from all damages and claims for damage that may arise by reason of this construction.
- I agree that the North Carolina Department of Transportation will assume no responsibility for any damages that may be caused to such facilities, within the highway right-of-way limits, in carrying out its construction.
- I agree to provide a Performance and Indemnity Bond in the amount specified by the Division of Highways for any construction proposed on the State Highway system.
- The granting of this permit is subject to the regulatory powers of the NC Department of Transportation as provided by law and as set forth in the N.C. Policy on Driveways and shall not be construed as a contract access point.
- I agree that the entire cost of constructing and maintaining an approved private street or driveway access connection and conditions of this permit will be borne by the property owner, the applicant, and their grantees, successors, and assignees.
- **I AGREE TO NOTIFY THE DISTRICT ENGINEER WHEN THE PROPOSED WORK BEGINS AND WHEN IT IS COMPLETED.**

SIGNATURES OF APPLICANT

PROPERTY OWNER (APPLICANT)		WITNESS	
COMPANY	Piedmont Triad Regional Water Authority (PTRWA)	NAME	Rebecca T. Brown
SIGNATURE	Executive Director	SIGNATURE	Rebecca T. Brown
ADDRESS	7297 Adams Farm Rd Randleman, NC 27317	ADDRESS	7297 Adams Farm Rd Randleman NC 27317
	Phone No. (336) 498-5510		

AUTHORIZED AGENT		WITNESS	
COMPANY	Piedmont Triad Regional Water Authority (PTRWA)	NAME	Rebecca T. Brown
SIGNATURE	Executive Director	SIGNATURE	Rebecca T. Brown
ADDRESS	7297 Adams Farm Rd Randleman, NC 27317	ADDRESS	7297 Adams Farm Rd Randleman NC 27317
	Phone No. (336) 498-5510		

APPROVALS

APPLICATION RECEIVED BY DISTRICT ENGINEER

SIGNATURE	DATE

APPLICATION APPROVED BY LOCAL GOVERNMENTAL AUTHORITY (when required)

SIGNATURE	TITLE	DATE

APPLICATION APPROVED BY NCDOT

SIGNATURE	TITLE	DATE

INSPECTION BY NCDOT

SIGNATURE	TITLE	DATE

COMMENTS:

Subject: FW: NCDEQ Erosion & Sedimentation Control Letter of Plan Approval with Modifications Needed CRM:0170365

Attachments: Application Report - Wednesday, April 9, 2025 1118 AM.pdf; Post-Const NORR WSRO 20250127.pdf; RANDO-2025-0157_Waterline PTRWA - Asheboro.pdf

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From: SVC_DoNotReply-DEQPermits <DoNotReply-DEQPermits@deq.nc.gov>
Sent: Wednesday, April 9, 2025 11:24 AM
To: Flory, Gregory T <gflory@ptrwa.org>; John Grey <jgrey@thewootencompany.com>
Cc: Moffitt, Jason A <jason.moffitt@deq.nc.gov>
Subject: NCDEQ Erosion & Sedimentation Control Letter of Plan Approval with Modifications Needed CRM:0170365

North Carolina Department of Environmental Quality

Division of Energy, Mineral & Land Resources

Land Quality Section

Josh Stein
Governor
D. Reid Wilson
Secretary
William (Toby) Vinson Jr.
Director

04-09-2025

LETTER OF APPROVAL WITH MODIFICATIONS

Piedmont Triad Regional Water Authority (PTRWA)
PO BOX 1326
Randleman, North Carolina 27317

RE: Project Name: Waterline PTRWA - Asheboro

Acres Approved: 12.1

Application ID: PA-010416

Permit Number: RANDO-2025-0157

Address: US 311, Heath Dairy Rd

City: Randleman

County: Randolph

River Basin: Yadkin - Pee Dee

Stream Classification: C: Aquatic Life, Secondary Contact Recreation, Fresh water

Plan Type: Revised Plan

Dear Piedmont Triad Regional Water Authority (PTRWA),

This office has reviewed the subject erosion and sedimentation control plan. We find the plan to be acceptable with modifications and hereby issue this Letter of Approval with Modifications. The Certificate of Approval must be posted at the job site. Please see the attached Application Report (FRO form), Letter of Approval (LOA) and the Certificate of Approval (COA), if applicable. This plan approval shall expire three (3) years following the date of approval, if no land-disturbing activity has been undertaken, as is required by Title 15A NCAC 4B .0129.
The attached, signed, digital copy of the letter may be used to submit with your electronic Notice of Intent (eNOI) in order to receive your Certificate of Coverage (COC). As of April 1, 2019, all new construction activities are required to complete and submit an electronic Notice of Intent (eNOI) form requesting a Certificate of Coverage (COC) under the NCG010000 Construction General Permit. After the form is reviewed and found to be complete, you will receive a link with payment instructions for the $120 annual permit fee. After the fee is processed, you will receive the COC via email. As the Financially Responsible Party shown on the FRO form submitted for this project, you MUST obtain the COC prior to commencement of any land disturbing activity. The eNOI form may be accessed at deq.nc.gov/NCG01. Please direct questions about the eNOI form to the Stormwater Program staff in the Raleigh central office. If the owner/operator of this project changes in the future, the new responsible party must obtain a new COC.

Title 15A NCAC 4B .0118(a) and the NCG01 permit require that the following documentation be kept on file at the job site:

1. The approved E&SC plan as well as any approved deviation.
2. The NCG01 permit and the COC, once it is received.
3. Records of inspections made during the previous 12 months.

Also, this letter gives the notice required by G.S. 113A-61.1(a) of our right of periodic inspection to ensure compliance with the approved plan.

North Carolina's Sedimentation Pollution Control Act is performance-oriented, requiring protection of existing natural resources and adjoining properties. If, following the commencement of this project, the erosion and sedimentation control plan is inadequate to meet the requirements of the Sedimentation Pollution Control Act of 1973 (North Carolina General Statute 113A-51 through 66), this office may require revisions to the plan and implementation of the revisions to insure compliance with the Act.

Acceptance and approval of this plan is conditioned upon your compliance with Federal and State water quality laws, regulations, and rules. In addition, local city or county ordinances or rules may also apply to this land-disturbing activity. This approval does not supersede any other permit or approval.

Please note that this approval is based in part on the accuracy of the information provided in the Financial Responsibility/Ownership Form, which you provided. You are requested to file an amended form if there is any change in the information included on the form. This permit allows for a land-disturbance, as called for on the application and plan, not to exceed the approved acres. Exceeding the acreage can be a violation of this permit and may require a revised plan and additional application fee. In addition, it would be helpful if you notify this office of a change to the proposed starting date for this project.

Modifications Required for Approval:

General Comments:

1. Please print this email as your Letter of Approval for your NCG010000 Certificate of Coverage application.

2.Please notify this office prior to your pre-construction conference for this project by calling (336) 776-9800 and asking to speak with the Land Quality inspector for your county. Permission must be obtained and granted from NC DEQ DEMLR prior to the removal of any ESC measures. All additional permits should be obtained, as necessary, prior to beginning construction. [GS 113A-51, 15A NCAC 4B .0120]

3. Any off-site borrow and waste required for this project must come from a site with an approved erosion control plan, a site regulated under the Mining Act of 1971, or a landfill regulated by the Division of Solid Waste Management. Trash/debris from demolition activities or generated by any activities on site must be disposed of at a facility regulated by the Division of Solid Waste Management or per Division of Solid Waste Management or Division of Water Resources rules and regulations. [15A NCAC 4B .0110]

4. Additional measures may be required - The applicant is responsible for the control of sediment on-site. If the approved erosion and sedimentation control measures prove insufficient, the applicant must take those additional steps necessary to stop sediment from leaving this site. [15A NCAC 4B .0115]

5. The NCG01 has a $120 yearly fee and our office often receives closure inspection requests days prior to yearly NCG01 fee payment due dates. Be advised the project requires a closure inspection report by DEMLR prior to filing the Notice of Termination (NOT) to terminate NCG01 coverage. The closure inspection should not be requested until after the site has achieved full vegetative stabilization and measures have been removed. The removal of temporary ESC measures, including basins, requires prior approval. Often, a full growing season is necessary between initial seeding/mulching and removal of measures. Please plan your construction accordingly to avoid contacting our office prematurely for a closure inspection. Also be advised you may be asked for representative site pictures prior to a closure inspection. [General Comment]

Your cooperation is appreciated.

Sincerely,
Jack Lawry-Popelka, EIT
336-776-9659

North Carolina Department of Environmental Quality
Division of Energy, Mineral & Land Resources
Land Quality Section

Enclosures: Certificate of Approval
Post Construction NORR

North Carolina Department of Environmental Quality | Division of Energy, Mineral and Land Resources
Winston-Salem Regional Office | 450 West Hanes Mill Road, Suite 300 | Winston-Salem NC, 27105
336-776-9800

Email correspondence to and from this address may be subject to the North Carolina Public Records Law and may be disclosed to third parties by an authorized state official.

CERTIFICATE OF PLAN APPROVAL

The posting of this certificate certifies that an erosion and sedimentation control plan has been approved for this project by the North Carolina Department of Environmental Quality in accordance with North Carolina General Statute 113A – 57 (4) and 113A – 54 (d) (4) and North Carolina Administrative Code, Title 15A, Chapter 4B.0107 (c). This certificate must be posted at the primary entrance of the job site before construction begins and until establishment of permanent groundcover as required by North Carolina Administrative Code, Title 15A, Chapter 4B.0127 (b).

Waterline PTRWA - Asheboro
US 311, Heath Dairy Rd Randleman, NC 27350

4/9/2025
Date of Plan Approval

RANDO-2025-0157
Project Identifier

Certificate of Coverage Number: _____

JOSH STEIN
Governor
D. REID WILSON
Secretary
RICHARD E. ROGERS, JR.
Director

NORTH CAROLINA
Environmental Quality

January 22, 2025

Piedmont Triad Water Authority (PTRWA)
Attention: Gregory Flory, Executive Director
P.O. Box 1326
Randleman, NC 27317

Re: Engineering Plans and Specifications Approval
Distribution Extension
Waterline PTRWA - Asheboro
PIEDMONT TRIAD REGIONAL
Water System No.: NC3076010
Randolph County
Serial No.: 24-01295
Funding No.: Direct Appropriation

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, 24-01295 dated January 22, 2025. **This approval has the following condition(s):**

Necessary 401 and 404 certifications/permits must be obtained prior to water main installation within the depicted impacted wetland areas and stream crossing. Railroad crossing permits must also be in place before starting construction at the railroad crossing areas.

Engineering plans and specifications prepared by John C. Grey, P.E. call for the installation of approximately 18,260 feet of 16-inch water main, 570 feet of 20-inch water main, 40 feet of 12-inch water main, valves, fire hydrants, and associated appurtenances along US HWY 311, Heath Dairy Road, and within an easement next to I-74 in Randleman, Randolph County. The proposed project will connect to an existing 24-inch water main located along US HWY 311 near Island Ford Road as well as existing 12-inch and 16-inch water mains in an easement next to I-74, 80 feet south of Pineview 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 (USB) is being forwarded to our Winston-Salem Regional Office. The second copy of the USB is being retained in our office.

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

Sincerely,

RBSadosky

Rebecca Sadosky, Ph.D., Chief
Public Water Supply Section
Division of Water Resources

RS/CC

Enclosures: Approval Documents

cc: D. Shawn Fox, Winston-Salem Regional Office
Randolph County Health Department
The Wooten Company
David Giachini, P.E., Division of Water Infrastructure

RECEIVED
JAN 27 2024
The Wooten Company
Winston-Salem Regional Office

JOSH STEIN
Governor
D. REID WILSON
Secretary
RICHARD E. ROGERS, JR.
Director

NORTH CAROLINA
Environmental Quality

January 22, 2025

PIEDMONT TRIAD REG WTR AUTHORITY (PTRWA)
ATTN: GREGORY FLORY, EXECUTIVE DIRECTOR
PO BOX 1326
RANDLEMAN, NC 27317

Re: **Authorization to Construct (This is not a Final Approval)**
Issue Date: January 22, 2025
WATERLINE PTRWA.ORG
Serial No.: 24-01295 Water System No.: NC3076010
Randolph 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 **WATERLINE PTRWA.ORG, Serial No.: 24-01295.**

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 Systems [15A NCAC 18C] 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 or attachment to an e-mail message to **PWSSection.PlanReview@deq.nc.gov.**

If this "Authorization to Construct" is for a new public water system, the owner must submit a completed **application for an Operating Permit** and the appropriate fee. For a copy of the application for an Operating Permit please call (919) 707-9076.

Once the certifications and permit application and fee (if applicable) 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,

RBSadosky

Rebecca Sadosky, Ph.D., Chief
Public Water Supply Section
Division of Water Resources, NCDEQ

cc: SHAWN FOX, Regional Engineer
THE WOOTEN COMPANY

North Carolina Department of Environmental Quality
Division of Water Resources

Authorization to Construct

Project Applicant:	**PIEDMONT TRIAD REG WTR AUTHORITY (PTRWA)**
Public Water System Name:	**PIEDMONT TRIAD REGIONAL**
Water System No.:	**NC3076010**
Project Name:	**WATERLINE PTRWA.ORG**
Serial No.:	**24-01295**
Issue Date:	**January 22, 2025**
Expiration Date:	36 Months after Issue Date

In accordance with 15A NCAC 18C .0305, this Authorization to Construct must be posted at the primary entrance to the job site during construction.

RAILPROS

May 07, 2025

Gregory Flory
PIEDMONT TRIAD REGIONAL WATER AUTHORITY (PTRWA)
PO Box 1326
Randleman, North Carolina, 27317

RE: Proposed installation of one (1) underground transverse 16-inch DIP water pipeline encased in a 30-inch casing within Heath Dairy Road (DOT 722447H)

Blue Ridge Division, at Mile Post 16.76 - EM
Randleman, Randolph County, North Carolina
Latitude / Longitude: 35.8043013 / -79.8283665
NS Activity No. 1326600

Dear Gregory Flory:

Attached for your records is a copy of the fully executed agreement countersigned by Norfolk Southern Railway Company ("Railway").

For Scheduling of Flagging & Construction Monitoring submit a Protection Services Coordination request online at: https://ns.railprospermitting.com

If you have questions regarding the Protection Service request process, the work plan requirements, or need assistance submitting a request, please send an email to NS.Info@RailPros.com or call (402) 965-0539. It is recommended that the contractor or construction field manager submit the request as information on specific construction means and methods are required. Projects are scheduled only after the construction work plan has been approved. **Entry onto Railway's property without the Division Engineer or their representative's prior approval is considered trespassing**.

NOTE: Please email to ns.permitting@railpros.com complete as-built drawings of the Facilities in an electronic format within thirty (30) days of (i) completion of the initial installation of the Facilities and (ii) completion of any material change to the Facilities.

Sincerely,
Valerie Harrill

Valerie Harrill
Real Estate Manager

11819 Miracle Hills Dr, Suite 102
PO Box 642270
Omaha, NE 68164

P: (402) 965-0539 **F**: (866) 762 - 7619
www.railpros.com

Docusign Envelope ID: 5D88D029-4C2C-4455-B94E-ACD9367FBA78

NORFOLK SOUTHERN RAILWAY COMPANY

ACKNOWLEDGMENT FORM FOR WIRE AND/OR PIPE OCCUPATION WITHIN THE LIMITS OF A PUBLIC RIGHT OF WAY.

APPLICANT: PIEDMONT TRIAD REGIONAL WATER AUTHORITY (PTRWA)
7297 Adams Farm Rd
Randleman, North Carolina 27317

SUBJECT: Randleman, Randolph County, North Carolina
Milepost 16.76 - EM, High Point-Ashebor , Blue Ridge Division
Latitude 35.8043013, Longitude -79.8283665

Norfolk Southern Activity No. 1326600
Proposed installation of one (1) underground transverse 16-inch DIP water pipeline encased in a 30-inch casing within Heath Dairy Road (DOT 722447H) (collectively, the "Facilities")

In response to Applicant's submittal dated January 02, 2025, regarding the proposed construction of the subject project, Norfolk Southern Railway Company ("Railway") does not object to the installation of the Facilities as shown on the attached Drawing marked **Exhibit "A",** dated March 27, 2025, provided Applicant adheres to the following terms and conditions:

- The Facilities shall be installed, constructed, maintained, repaired, operated and removed by and at the sole risk, cost and expense of the Applicant, (collectively, "Operate" or "Operations").
- The Facilities must conform with all Federal, State and local laws, rules and regulations and will not be attached to any railroad structure or appurtenance and will not be located on any private property of Railway.
- The design and construction of aerial Facilities shall comply with Railway's NSCE-4 Specification, latest edition, and underground Facilities shall comply with Railway's NSCE-8 Specification, latest edition.
- Insurance

(a) Insurance Requirements. Without limiting in any manner the liability and obligations assumed by Applicant under any other provision of this Agreement, and as additional protection to Railway, Applicant shall comply with the following provisions:

(i) Subject to subsection (ii) below, upon execution of this Agreement, Applicant shall pay Railway a risk financing fee of $1,900 (the "Risk Financing Fee") to provide Railroad Protective Liability Insurance or such supplemental insurance (which may be self-insurance) as Railway, in its sole discretion, deems to be necessary or appropriate with respect to the initial construction and installation of the Facilities.

(ii) Prior to commencement of each Operations project that requires access to the Premises, unless Railway elects to make available and Applicant pays the then-current Risk Financing Fee for a given Operations project, Applicant shall furnish Railway with an original Railroad Protective Liability ("RPL") Insurance Policy naming Railway as the named insured and having a limit of (1) not less than a combined single limit of $2,000,000 each occurrence and $6,000,000 aggregate, or (2) if the value of a given operations project exceeds $350,000, not less than a combined single limit of $5,000,000 per occurrence and $10,000,000 in the aggregate. Each RPL policy shall conform to CG 00 35 04 13 or equivalent and include coverage for Terrorism and the Physical Damage to Property Endorsement and shall name Norfolk Southern Corporation and its affiliates and subsidiaries as the insured. Applicant shall ensure that the project location, Applicant identification and work description appear on the declaration pages of a given RPL policy. Applicant shall provide an electronic copy of each RPL policy (and not merely the binder) to Railway at ns.permitting@railpros.com for review and approval prior to commencing any work on the associated Operations project. Applicant may submit inquiries about RPL issues at ns.permitting@railpros.com.

Docusign Envelope ID: 5D88D029-4C2C-4455-B94E-ACD9367FBA78

(iii) Applicant shall maintain a Commercial General Liability ("CGL") policy containing products and completed operations and contractual liability coverage, with a combined single limit of not less than $2,000,000 for each occurrence. Any portion of this requirement may be satisfied by a combination of General Liability and/or Excess/Umbrella Liability Coverage. The policy shall not deny any obligation of any insured under the Federal Employer's Liability Act, as amended. The CGL policy shall provide additional insured coverage equivalent to ISO CG 20 10 11/85.

(iv) Applicant shall maintain Automobile Liability Insurance with a current ISO occurrence form policy (or equivalent) and apply on an "any auto" (Symbol 1) basis, including coverage for all vehicles used in connection with the Work or Services on the leased property, providing annual limits of at least $1,000,000 per occurrence for bodily injury and property damage combined including uninsured and underinsured motorist coverage, medical payment protection, and loading and unloading.

(v) Applicant shall maintain Workers' Compensation Insurance to meet fully the requirement of any compensation act, plan or legislative enactment applicable in connection with the death, disability or injury of Applicant's officers, agents, servants or employees arising directly or indirectly out of the performance of this Agreement;

(vi) Applicant shall maintain Employers' Liability Insurance with limits of not less than $1,000,000 each accident $1,000,000 policy limit for disease, and $1,000,000 each employee for disease;

(b) General Insurance Requirements. Each insurance policy referred to in subsection (a) above shall also comply with the following requirements:

(i) Additional Insureds. Each insurance policy (excluding any RPL policy and Workers' Compensation policy) shall name Railway and its parent, subsidiary and affiliated companies as additional insureds with an appropriate endorsement to each policy.

(ii) Applicant's Coverage Primary and Without Right to Contribution. All policies secured by Applicant, whether primary, excess, umbrella or otherwise, and providing coverage to the Railway as an additional insured (i) are intended to take priority in responding and to pay before any insurance policies Railway may have secured for itself must respond or pay and (ii) may not seek contribution from any policies the Railway may have secured for itself.

(iii) Severability of Interests (Cross Liability). No cross-liability exclusions are permitted that would apply to the additional insureds, and there may not be any restrictions in any policy that limits coverage for a claim brought by an additional insured against a named insured.

(iv) Waiver of Subrogation. To the fullest extent permitted by law, all insurance furnished by Applicant pursuant to this Agreement shall include a waiver of subrogation in favor of Railway with an appropriate endorsement to each policy.

(v) Notice of Cancellation, Modification or Termination. Each insurance policy shall not be subject to cancellation, termination, modification, changed, or non-renewed except upon thirty (30) days prior written notice to the additional insureds.

(vi) No Limitation. Each insurance policy shall not limit any of Applicant's indemnity obligations or other liabilities under this Agreement. The insurance available to Railway and its parent, subsidiary and affiliated companies as additional insureds shall not be limited by these requirements should Applicant maintain higher coverage limits.

(vii) Any deductibles or self-insured retentions of Applicant over $50,000 must be declared and approved by Railway. Approval of such requests shall not be unreasonably withheld.

(viii) Applicant shall require all subcontractors who are not covered by the insurance carried by Applicant to maintain the insurance coverages set forth in subsection (a) above, except

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for the RPL insurance, including but not limited to additional insured status for Railway and its parent, subsidiary and affiliated companies.

(ix) Applicant shall furnish their memorandum of insurance and the RPL Insurance Policy to Railway's Managing Agent prior to execution of this Agreement at ns.permitting@railpros.com. The insurance coverage required herein shall in no way limit Applicant's liability under this Agreement.

- Railway shall, at Railway's option, furnish, at the sole expense of Applicant, Support Services. The term "Support Services" means such materials and services as necessary, in Railway's sole judgment, to support Railway's tracks and to protect Railway's traffic, including without limitation flagging services and construction monitoring during the installation, maintenance, repair, renewal or removal of the Facilities. Support Services shall be provided unless Railway's Division Engineer or his or her authorized representative provides to Applicant a written waiver of Support Services, whether in whole or in any part, in a given instance. The term "Construction Monitoring" means services comprised of one or more Railway representatives being assigned and present to monitor construction activities of Applicant, which may include a preconstruction site assessment and a post-construction site assessment.

- Prior to commencement of any work to be performed on or about Premises, Applicant shall notify the appropriate Division Engineer or their authorized representative for the scheduling of "Support Services". Within seventy-two (72) hours after the Division Engineer's or their authorized representative's actual receipt of such notification, they shall review the necessity and availability of Support Services for the proposed work and advise Applicant of such matters and the estimated cost therefor. No work shall be permitted on or about the Premises without the presence of Railway's Support Services or the Division Engineer's waiver of the requirement for Support Services. Entry on or about the Premises or any other Railway right-of-way without the Division Engineer's prior approval shall be deemed trespassing. Applicant agrees to pay Railway, within thirty (30) days after delivery of an invoice therefor, for any protection and inspection costs incurred by Railway, in Railway's sole judgment, during any such entry.

- In the event it becomes necessary for Applicant to deviate from the approved plans and specifications, Applicant shall seek prior approval from Railway's Division Engineer or his or her authorized representative and, when applicable, an authorized representative of the Division Engineer in the field during Construction Monitoring or inspection.

- All cost or expense resulting from any and all loss of life or property, or injury or damage to the person or property of any person, firm or corporation (including the parties hereto and their respective officers, agents and employees) and any and all claims, demands or actions for such loss, injury or damage, caused by or growing out of the presence or use, or the construction, maintenance, renewal, change or relocation and subsequent removal of the Facilities and appurtenances herein referred to shall be borne by Applicant unless caused solely by the negligence or willful misconduct of Railway.
- Upon abandonment of the Facilities by Applicant, Applicant shall seek direction from Railway's Chief Engineer, or his representative, regarding the method of abandonment if the Facilities will be abandoned in place.
- In the event the Facilities consist of electrical power or communication wires and appurtenances, Applicant shall promptly remedy any inductive interference growing out of, or resulting from the presence of, the Facilities.
- In the event the Facilities consist of an underground occupation, Applicant will be responsible for any settlement caused to the roadbed, right of way and/or tracks, facilities and appurtenances of Railway arising from or as a result of the installation of the Facilities, and Applicant shall pay to Railway on demand the full cost and expense.

- All rights and obligations conferred hereby shall extend to the successors and assigns of the parties hereto, provided that the Applicant shall in no event transfer or assign its rights hereunder without the written consent of Railway, which will not be unreasonably withheld.

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- If the public road is abandoned by the appropriate governmental authority and the Facilities remain within the limits of Railway's right of way after such abandonment, as a condition for the continuing presence of the Facilities within Railway's right of way, Railway and Applicant shall agree upon an appropriate occupancy fee or rental for the Facilities and execute an amendment to this Agreement within ninety (90) days after the date upon which such public road is abandoned.
- Any and all notices, demands or requests by or from Railway to Applicant, or Applicant to Railway, shall be in writing and shall be sent by (a) postage paid, certified mail, return receipt requested, or (b) a reputable national overnight courier service with receipt therefor, or (c) personal delivery, and addressed in each case as follows:

If to Railway: c/o Norfolk Southern Corporation
650 West Peachtree St. Box 22
Atlanta, Georgia 30308
Attention: Director Real Estate

If to Applicant: PIEDMONT TRIAD REGIONAL WATER AUTHORITY (PTRWA)
PO Box 1326
Randleman, North Carolina 27317
Attention: Gregory Flory

Either party may, by notice in writing, direct that future notices or demands be sent to a different address. All notices hereunder shall be deemed given upon receipt (or, if rejected, upon rejection).

ACCEPTED BY:

NORFOLK SOUTHERN RAILWAY COMPANY

DS KSH

Signed by: _____ DATE _____
288ZD5D551D04F0...
Real Estate Manager

PIEDMONT TRIAD REGIONAL WATER AUTHORITY (PTRWA)

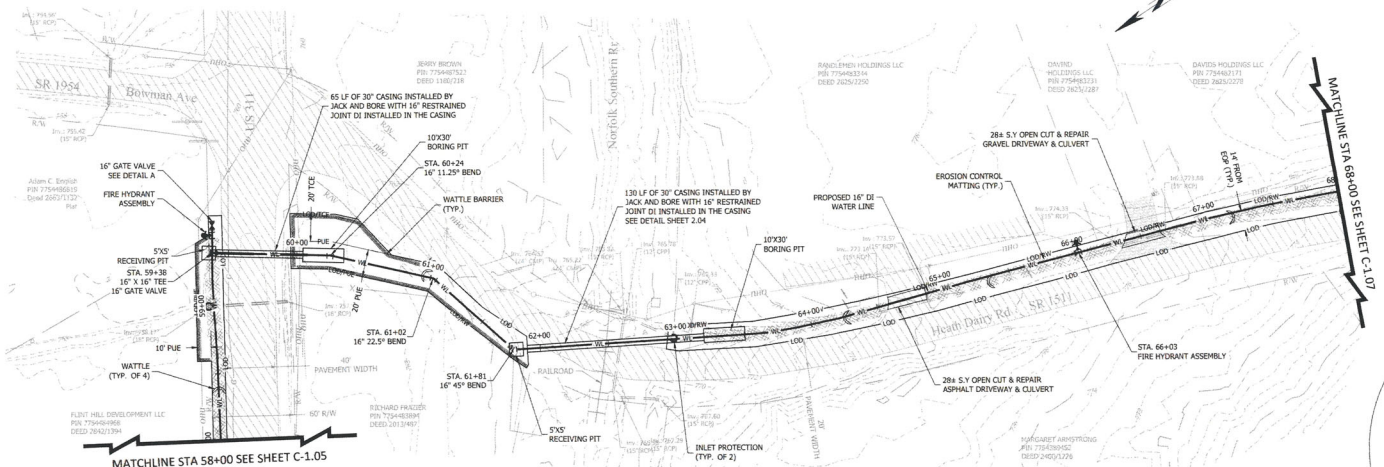
Signed by: Gregory Flory (Licensee/Facility Owner)
C01F85875F77499... DATE April 10, 2025 | 17:30 PDT

Title Executive Director

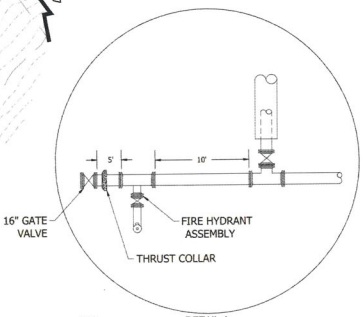
Activity Number: 1326600
04/02/2025

DS JJ

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NOTES:
1. THE LOCATION OF THE NEW 16" WATER LINE SHALL BE GENERALLY SHOWN BASED ON THE FIELD LOCATION OF EXISTING BURIED UTILITIES. DEVIATION TO THE ALIGNMENT SHOWN SHALL NOT BE MADE WITHOUT THE APPROVAL OF THE ENGINEER.
2. MAINTAIN ACCESS TO PRIVATE DRIVEWAYS AT ALL TIMES. REPAIR/REPLACE GRAVEL, CONCRETE AND/OR ASPHALT DRIVE FOLLOWING PIPELINE CONSTRUCTION.
3. A DRAINAGE DITCH OF VARYING WIDTH AND DEPTH EXISTS ALONG THE ROADWAY. MAINTAIN DRAINAGE COURSE AT ALL TIMES DURING CONSTRUCTION AND REGRADE ANY DISTURBED TO MATCH EXISTING.
4. FOR DRIVEWAY IMPACTED BY CONSTRUCTION THAT HAVE EXISTING 12" RCP, REMOVE EXISTING 12" RCP AND REPLACE WITH NEW 15" RCP. MATCH EXISTING INVERT ELEVATION. NEW 15" RCP WILL BE PAID FOR AT COST. CONTRACTOR SHALL PROVIDE PURCHASE INVOICE FOR 15" RCP AND OWNER WILL PAY THAT AMOUNT.



DETAIL A
N.T.S.

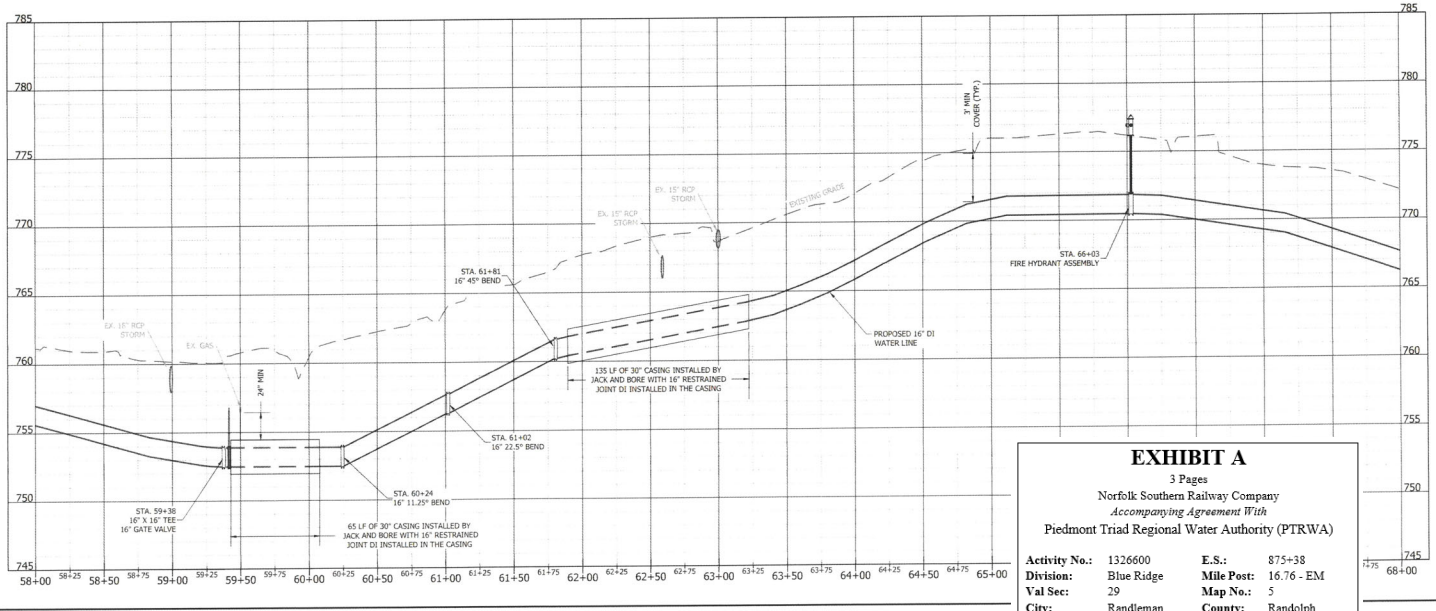


EXHIBIT A

3 Pages

Norfolk Southern Railway Company

Accompanying Agreement With

Piedmont Triad Regional Water Authority (PTRWA)

Activity No.:	1326600	**E.S.:**	875+38
Division:	Blue Ridge	**Mile Post:**	16.76 - EM
Val Sec:	29	**Map No.:**	5
City:	Randleman	**County:**	Randolph
State:	North Carolina		
Lat:	35.8043013	**Long:**	-79.8283665

All work to be performed in accordance with the latest approved Norfolk Southern NSCE-4 and NSCE-8 Specifications

BLASTING NOT PERMITTED **DATED 03/27/2025**

CRITEK ENGINEERING GROUP
4800 KOGER BLVD., SUITE 180, GREENSBORO, NC 27407
T: (336) 346-1989 | WWW.CRITEKGROUP.COM | LICENSE: C-4361

811 Know what's below. 811 before you dig.

FINAL DRAWING
FOR REVIEW PURPOSES ONLY
NOT RELEASED FOR CONSTRUCTION

REVISIONS
REVISION NOTE	X / XX / XXXX

Wooten
300 S. Main Street • Winston-Salem, NC 27101
(803) 722-5328 • thewootencompany.com
License Number: F-0315

PIEDMONT TRIAD REGIONAL WATER AUTHORITY
RANDOLPH COUNTY NORTH CAROLINA
WATER LINE PTRWA - ASHEBORO
STA. 58+00 - STA. 68+00



12/09/2024

DESIGNED BY:
DRAWN BY:
CHECKED BY:
PROJECT NO.: 3190-L
DATE: NOVEMBER 2024
SCALE:
HORZ.: 1" = 40'
VERT.: 1" = 4'

0 1/2 1"
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

C-1.06

C:\Users\Lester Wilder\Dropbox\Clients\2024\Greensboro\13 - Randolph WL\Design\CAD\To Wooten\12-5-2024 Randolph Water Line Design.dwg LESTER WILDER 12/5/2024 8:32 AM

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EXHIBIT A

3 Pages

Norfolk Southern Railway Company

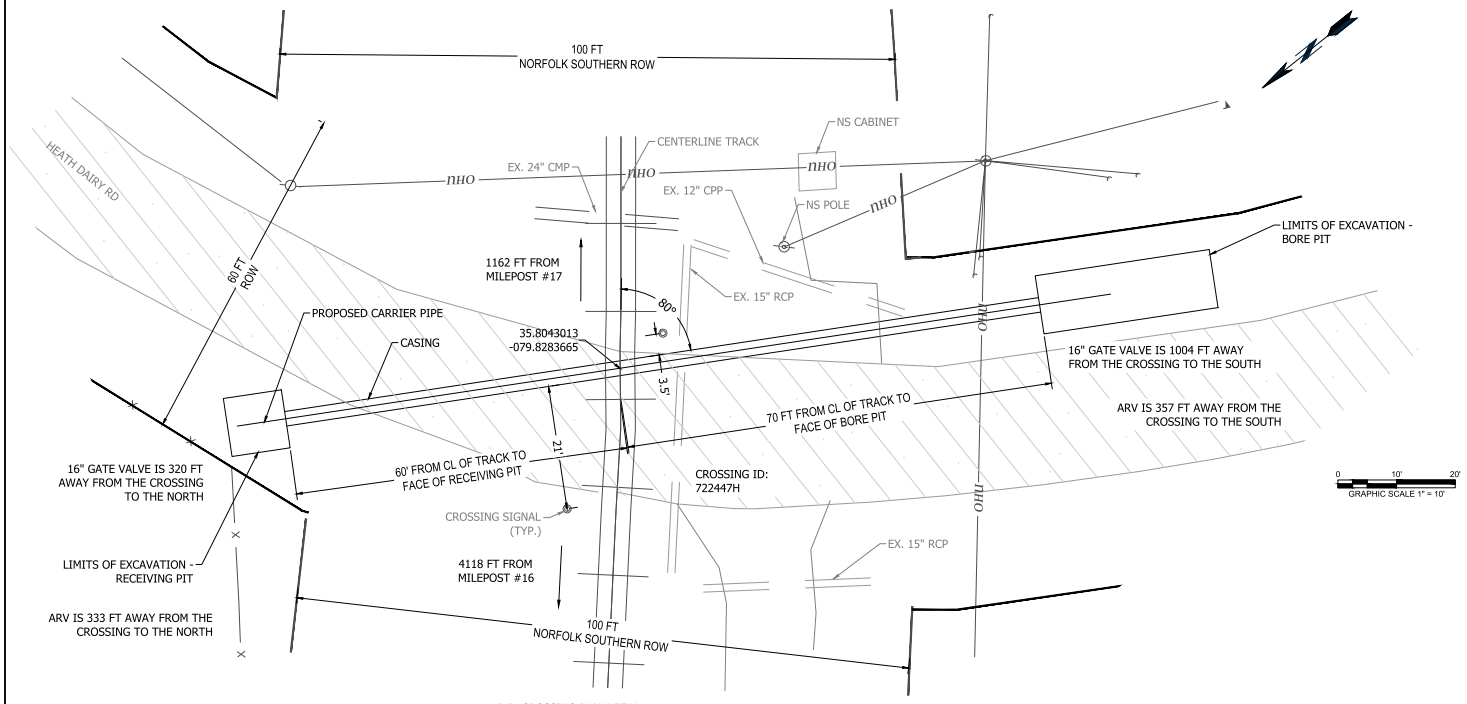
Accompanying Agreement With

Piedmont Triad Regional Water Authority (PTRWA)

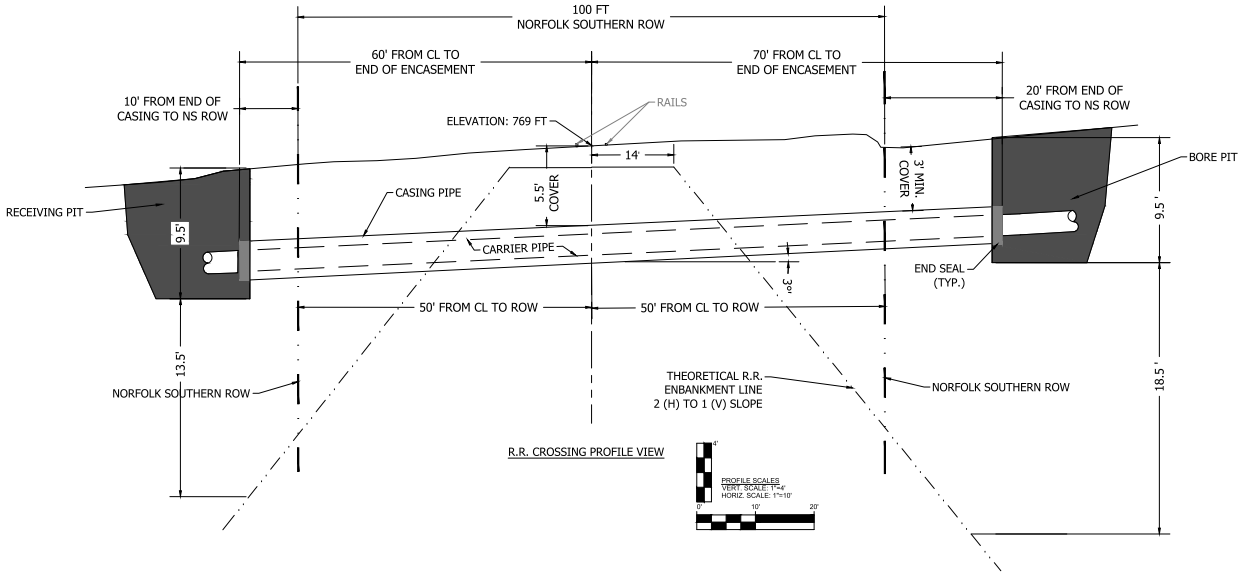
Activity No.:	1326600	**E.S.:**	875+38
Division:	Blue Ridge	**Mile Post:**	16.76 - EM
Val Sec:	29	**Map No.:**	5
City:	Randleman	**County:**	Randolph
State:	North Carolina		
Lat:	35.8043013	**Long:**	-79.8283665

All work to be performed in accordance with the latest approved Norfolk Southern NSCE-4 and NSCE-8 Specifications

BLASTING NOT PERMITTED **DATED 03/27/2025**



R.R. CROSSING PLAN VIEW



R.R. CROSSING PROFILE VIEW

GENERAL NOTES:

1. THE CONTRACTOR SHALL FOLLOW ALL REQUIREMENTS OF NORFOLK SOUTHERN'S NSCE-8 SPECIFCATIONS.
2. PIPELINE AND CROSSING TO BE INSTALLED AND MAINTAINED IN ACCORDANCE WITH LAST APPROVED AMERICAN RAILWAY ENGINEERING AND MAINTENANCE OF WAY ASSOCIATION SPECIFICATIONS FOR PIPELINES CONVEYING FLAMMABLE AND NON-FLAMMABLE SUBSTANCES.
3. BLASTING IS NOT PERMITTED.
4. WATER LINE SHALL BE PROMENENTLY MARKED AT RIGHT-OF-WAY LINES (ON BOTH SIDES OF TRACK) BY DURABLE, WEATHERPROOF SIGNS LOCATED OVER THE CENTERLINE OF PIPE. SIGNS SHALL HAVE THE FOLLOWING INFORMATION PRESENTED:
   (1) PIEDMONT TRIAD REGIONAL WATER AUTHORITY
   7297 ADAMS FARM ROAD, RANDLEMAN, NC 27317
   (2) WATER LINE
   (3) 150 PSI
   (4) (336) 498-5510

CRI TEK ENGINEERING GROUP
4900 KOGER BLVD., SUITE 180, GREENSBORO, NC 27407
T: (336) 348-1889 | WWW.CRITEKGROUP.COM | LICENSE: C-4061

FINAL DRAWING
FOR REVIEW PURPOSES ONLY
NOT RELEASED FOR CONSTRUCTION

REVISIONS
x / xx / xxxx
REVISION NOTE

Wooten
300 S. Main Street • Winston-Salem, NC 27101
(803) 722-5326 • thewootencompany.com
License Number - F-0115

PIEDMONT TRIAD REGIONAL WATER AUTHORITY
RANDOLPH COUNTY NORTH CAROLINA
WATER LINE PTRWA – ASHEBORO
RAIL ROAD CROSSING DETAIL

NORTH CAROLINA PROFESSIONAL SEAL 41007 ENGINEER JOHN C. GREY
02/18/2025

DESIGNED BY:
DRAWN BY:
CHECKED BY:
PROJECT NO.: 3190-L
DATE: NOVEMBER 2024
SCALE:
HORZ.: 1" = 10'
VERT.: 1" = 4'

IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

C-2.04

T:\Projects\Randolph_County-3190\L-Waterline PTRWA-Asheboro_CADD\DesignModels\RANDOLPH RR DETAIL.dwg BHUEY 2/17/2025 4:23 PM

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ABBREVIATIONS:

A	AREA
ABND	ABANDONED
ABC	AGGREGATE BASE COURSE
AFF	ABOVE FINISHED FLOOR
APRX	APPROXIMATE
ASPH	ASPHALT
ASSY	ASSEMBLY
AVG	AVERAGE
ARV	AIR RELEASE VALVE
AZ	AZIMUTH
AWWA	AMERICAN WATER WORKS ASSOCIATION
B-B	BACK OF CURB TO BACK OF CURB
BLDG	BUILDING
BM	BENCHMARK
BO	BLOW-OFF
BOA	BLOW-OFF ASSEMBLY
BOT	BOTTOM
BW	BARBED WIRE
C&G	CURB AND GUTTER
CB	CATCH BASIN
C	CENTERLINE
CIP	CAST IRON PIPE
CI	CURB INLET
CLR	CLEARANCE
CM	CONCRETE MONUMENT
CMP	CORRUGATED METAL PIPE
CMU	CONCRETE MASONRY UNIT
CO	CLEAN OUT
COMM	COMMUNICATIONS
CONC	CONCRETE
CONT	CONTINUOUS
CSTR	CONSTRUCTION
CONTR	CONTRACTOR
COR	CORNER
CPED	CABLE TV PEDESTAL
CLVT	CULVERT
D	DEPTH
DI	DROP INLET
DIA	DIAMETER
DIP	DUCTILE IRON PIPE
DIM	DIMENSION
DISCH	DISCHARGE
DIST	DISTANCE
DNF	DID NOT FIND
DOT	DEPARTMENT OF TRANSPORTATION
DW	DOMESTIC WATER
DELTA	
E	EAST
E-E	EDGE OF PAVEMENT TO EDGE OF PAVEMENT
EACH	EACH
EFF	EFFLUENT
EIP	EXISTING IRON PIPE
EL	ELEVATION
ELEC	ELECTRIC
EPED	ELECTRIC PEDESTAL
EP	EDGE OF PAVEMENT
EW	EACH WAY
EWTR	EDGE OF WATER
Ex	EXISTING
EXPJT	EXPANSION JOINT
FDC	FIRE DEPARTMENT CONNECTION
FFE	FINISHED FLOOR ELEVATION
FG	FINISHED GRADE
FH	FIRE HYDRANT
FHA	FIRE HYDRANT ASSEMBLY
FHL	FIRE HYDRANT LEG
FHV	FIRE HYDRANT VALVE
FIN	FINISH
FLG	FLAG
FLNG	FLANGE
FM	FORCE MAIN
FOHH	FIBER OPTIC HAND HOLE
FOM	FIBER OPTIC MARKER
FOPD	FIBER OPTIC PEDESTAL
FP	FIRE PROCECTION
FPS	FEET PER SECOND
FT	FEET
FTG	FOOTING
G	GAS
GA	GAUGE
GALV	GALVANIZED
GM	GAS METER
GPM	GALLONS PER MINUTE
GR	GRADE
GTV	GATE VALVE
GV	GAS VALVE
GYP	GYPSUM
HCP	HANDICAPPED
HH	HAND HOLE
HORZ	HORIZONTAL
HP	HORSE POWER
HWA	HIGH WATER ALARM
HWL	HIGH WATER LEVEL
ID	INSIDE DIAMETER
IN	INCH
IN/HR	INCHES PER HOUR
INF	INFLUENT
INT	INTERSECTION
INV	INVERT
IPS	IRON PIPE SET
ISL	ISLAND
JB	JUNCTION BOX
KWY	KEYWAY
L	LENGTH
LF	LINEAR FEET
LP	LIGHT POLE
LT	LEFT
LWL	LOW WATER LEVEL
MAX	MAXIMUM
MATL	MATERIAL
MECH	MECHANICAL
MFR	MANUFACTURER
MH	MANHOLE
MIN	MINMUM
MJ	MECHANICAL JOINT
MON	MONUMENT
N	NORTH
NAD 83	NORTH AMERICAN DATUM 83
NCWN	NORMAL CROWN
NC GRID	NORTH CAROLINA GRID
NCGS	NORTH CAROLINA GEODETIC SURVEY
No.	NUMBER
NOM	NOMINAL
NTS	NOT TO SCALE
NWL	NORMAL WATER LEVEL
N/A	NOT AVAILABLE
N/R	NOT REQUIRED
OC	ON CENTER
OD	OUTSIDE DIAMETER
OH	OVERHEAD
ORIG	ORIGINAL
P	PROPERTY LINE
PC	POINT OF CURVATURE
PE	PLAIN END
PED	PEDESTAL
PI	POINT OF INTERSECTION
PIV	POST INDICATOR VALVE
POB	POINT OF BEGINNING
POC	POINT OF CONNECTION
POE	POINT OF ENDING
PRV	PRESSURE REDUCING VALVE
PSI	POUNDS PER SQUARE INCH
PT	POINT OR POINT OF TANGENCY
PUE	PERMANENT UTILITY EASEMENT
PVC	POLYVINYL CHLORIDE
PVMT	PAVEMENT
R	RADIUS
RCP	REINFORCED CONCRETE PIPE
REF	REFERENCE
REQ'D	REQUIRED
REINF	REINFORCED
RET	RETAINING
REV	REVISED
RPM	REVOLUTIONS PER MINUTE
RPZ	REDUCED PRESSURE ZONE
RT	RIGHT
R/W	RIGHT-OF-WAY
S	SOUTH
SCH	SCHEDULE
SDMH	STORM DRAINAGE MANHOLE
SF	SILT FENCE
SHT	SHEET
SGNL	SIGNAL POLE
SPECS	SPECIFICATIONS
SQ	SQUARE
SS	SANITARY SEWER
SSMH	SANITARY SEWER MANHOLE
SSTL	STAINLESS STEEL
ST	STREE
STA.	STATION
STD	STANDARD
SYM	SYMBOL
S/W	SIDEWALK
T	TANGENT
TBM	TEMPORARY BENCHMARK
TCE	TEMPORARY CONSTRUCTION EASEMENT
TCP	TERRA COTTA PIPE
TDD	TEMPORARY DIVERSION DITCH
TEMP	TEMPORARY
THH	TELEPHONE HAND HOLE
THK	THICK
TOC	TOP OF CURB
TOP	TOP OF SLOPE
TOW	TOP OF WALL
TPED	TELEPHONE PEDESTAL
TPHN	TELEPHONE
TRANS	TRANSFORMER
TRFCBX	TRAFFIC SIGNAL CONTROL BOX
TRFCPL	TRAFFIC SIGNAL POLE
TYP	TYPICAL
UMKR	UTILITY MARKER
UP	UTILITY POLE
U/G	UNDERGROUND
VC	VERTICAL CURVE
VCP	VITRIFIED CLAY PIPE
VERT	VERTICAL
VOL	VOLUME
VPC	VERTICAL POINT OF CURVATURE
VPI	VERTICAL POINT OF INTERSECTION
VPT	VERTICAL POINT OF TANGENCY
WL	WATER LINE
WM	WATER METER
WT	WEIGHT
WV	WATER VALVE
WTP	WATER TREATMENT PLANT
WWF	WELDED WIRE FABRIC
WWTP	WASTE WATER TREATMENT PLANT
W/	WITH
YH	YARD HYDRANT
YI	YARD INLET

NOTES

ADHERE TO THE FOLLOWING ITEMS IN THE CONSTRUCTION OF THE UTILITY, AND APPURTENANCES UNLESS OTHERWISE NOTED.

GENERAL

1. EXISTING UTILITIES ARE LOCATED ON PLANS APPROXIMATELY. NOTIFY UTILITY LOCATING SERVICE TO MARK LOCATION OF EXISTING UTILITIES AT LEAST 48 HOURS PRIOR TO COMMENCING CONSTRUCTION ACTIVITY. CONTRACTOR RESPONSIBLE FOR VERIFYING EXACT LOCATION OF THESE EXISTING UTILITIES.THE COST TO REPAIR THESE FACILITIES, IF DAMAGED, SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
2. PROTECT EXISTING PROPERTY CORNER MARKERS. REPLACE DISTURBED PROPERTY CORNERS BY A PROFESSIONAL LAND SURVEYOR.
3. TEMPORARILY REMOVE MINOR ITEMS AS REQUIRED FOR THE INSTALLATION OF THE UTILITY. MINOR ITEMS SHALL INCLUDE, BUT NOT BE LIMITED TO, EXISTING SIGNS, MAIL BOXES, STORM SEWER PIPES,SHRUBS (UNDER 6 FT IN HEIGHT), AND TREES (UNDER 3 INCH IN DIA.). REINSTALL ITEMS TO THEIR ORIGINAL CONDITION. TREES AND SHRUBS SHALL BE REPLANTED OUTSIDE OF EASEMENT AND RIGHTS-OF-WAY AT A LOCATION AGREED TO BY THE HOME OWNER. INCLUDE COST IN THE PER FOOT COST OF THE UTILITY BEING INSTALLED.
4. SUPPORT EXISTING POLES, FENCES, CULVERTS, PAVEMENT, UTILITIES, CURBING AND OTHER STRUCTURES DURING CONSTRUCTION. REPAIR DAMAGED ITEMS TO THEIR ORIGINAL CONDITION AT NO ADDITIONAL COST.
5. EXISTING BURIED FIBER LINES AND CABLE MAY BE IN THE WAY OF THE SHOWN ALIGNMENT. CONTRACTOR SHALL UNCOVER AND TEMPORARILY MOVE THE FIBER OR CABLES OUT OF THE WAY OF CONSTRUCTION THEN REBURY THE LINES AT THE APPROPRIATE DEPTH IN COORDINATION WITH THE UTILITY OWNER. THIS WORK SHALL BE INCLUDED IN THE COST OF PIPE INSTALLATION.
6. OPEN CUT PAVED DRIVEWAYS, SIDEWALKS, AND CURB AND GUTTER. REPLACE CURB AND GUTTER WITH NEW TO MATCH THE EXISTING CROSS SECTION. PROVIDE PAVEMENT PATCHING PER DETAIL.
7. COMPACT OPEN CUT ROADWAYS, LOCAL AND NCDOT, THOROUGHLY PER SPECIFICATIONS.
8. INSTALL FIRE HYDRANTS AS FAR BACK FROM THE ROAD AS POSSIBLE WHILE STILL WITHIN THE RIGHT OF WAY. FIRE HYDRANTS MAY BE SHOWN OUTSIDE OF RIGHT OF WAY FOR CLARITY.
9. LIMITS OF DISTURBANCE SHALL BE BOUND BY THE EDGE OF PAVEMENT TO THE RIGHT-OF-WAY UNLESS OTHERWISE SHOWN. DISTURBED AREA=12.6 ACRES.
10. PROFILE BASED ON ACTUAL FIELD SURVEYED DATA PREPARED AND FINALIZED BY THE WOOTEN COMPANY; MEASUREMENTS HAVE BEEN LOCALIZED AT NC STATE PLAN NAD 83 (2011) COORDINATES NORTH 752,000 SFT AND EAST 1,7520,00 SFT AND NAVD 88 ELEVATION 750 SFT YIELDING A COMBINED FACTOR OF 0.999889094.
11. PLAN CONTOURS BASED ON NC SPATIAL LIDAR DATA PREPARED BY NORTH CAROLINA EMERGENCY MANAGEMENT (NCEM). ALL HORIZONTAL DATA DELIVERED IN NC STATE PLANE COORDS NAD83 (2011) AND VERTICALLY AT NAVD88 (GEOID 12B).
12. FOR UNPAVED AREAS DISTURBED DURING CONSTRUCTION, 6 INCHES OF NCDOT NO. ABC AGGREGATE SHALL BE PROVIDED FOR THE FULL WIDTH OF UNPAVED DRIVEWAYS AND ROADS FROM THE EDGE OF THE ROAD SHOULDER TO 15 FEET PAST THE OPPOSITE SIDE OF THE PIPE TRENCH.
13. CONTRACTOR SHALL PROVIDE NON-STOP, CONTINUOUS BORING & TRACK MONITORING WHILE WORKING WITHIN THE NORFOLK SOUTHERN RIGHT-OF-WAY. CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING TRACK MONITORING PLAN THAT ADHERES TO NORFOLK SOUTHERN GUIDELINES.

EROSION CONTROL

1. INSTALL SILT FENCE OVER & AROUND TOP OF EXISTING STORM DRAINAGE INLETS & PIPES IN AND ADJACENT TO DISTURBED AREAS.
2. INSTALL SILT FENCE AROUND SPOIL PILES.
3. PROVIDE EROSION CONTROL MEASURES AROUND STOCK / WASTE PILES AND STAGING AREAS AS DIRECTED BY ENGINEER.
4. PROTECT STORM PIPE INLETS FROM SEDIMENT RUNOFF FROM LAND DISTURBING ACTIVITIES WITH SILT FENCE, STONE CHECK DAM, OR ARC FILTER AS APPROPRIATE FOR SITE CONDITIONS.
5. REPLACE DISTURBED STORM PIPE OUTLET PROTECTION WITH EQUAL OR GREATER AMOUNT OF RIP-RAP WITHIN 15 DAYS OF DISTURBANCE.
6. WHERE AREA AROUND OUTLET IS DISTURBED AND NO OUTLET PROTECTION EXISTS, CLASS "1" RIP-RAP SHALL BE PLACED AROUND PIPE OUTLET AS DIRECTED BY ENGINEER.
7. INSTALL NAGS-75 RECP OR EQUAL MATTING ON SLOPES GREATER THAN 3:1 AND WITH MORE THAN 10 FEET OF VERTICAL RELIEF.

EROSION CONTROL CONSTRUCTION SEQUENCE

1. CLEAR SITE ONLY AS NECESSARY TO INSTALL EROSION CONTROL DEVICES AS INDICATED ON THE DRAWINGS. INSTALL TEMPORARY EROSION CONTROL DEVICES AS SHOWN ON PLANS.
2. NOTIFY ENGINEER AND NCDENR, LAND QUALITY SECTION AT (910) 733-4574 FOR SITE INSPECTION PRIOR TO COMMENCING MAIN CONSTRUCTION OPERATIONS.
3. ONCE EROSION CONTROL DEVICES ARE APPROVED, BEGIN CONSTRUCTION OPERATIONS.
4. MAINTAIN EROSION CONTROL DEVICES AS NECESSARY DURING INSTALLATION OF WATER SYSTEM IMPROVEMENTS, INSPECT DEVICES AFTER EVERY RAINFALL EVENT AND CLEANOUT TRAPS AND/OR CHECK DAMS WHEN HALF FULL.
5. AS CONSTRUCTION PROGRESSES INSTALL ADDITIONAL EROSION CONTROL DEVICES AS INDICATED ON THE DRAWINGS, CALLED FOR IN SPECIFICATIONS, OR AS DIRECTED BY ENGINEER.
6. PROVIDE A GROUNDCOVER (TEMPORARY OR PERMANENT) ON EXPOSED SLOPES WITHIN 21 CALENDAR DAYS FOLLOWING COMPLETION OF ANY PHASE OF GRADING; AND, A PERMANENT GROUNDCOVER FOR ALL DISTURBED AREAS WITHIN 15 WORKING DAYS OR 90 CALENDAR DAYS (WHICHEVER IS SHORTER) FOLLOWING COMPLETION OF CONSTRUCTION OR DEVELOPMENT.
7. AFTER SITE IS STABILIZED, REQUEST AN INSPECTION BY THE ENGINEER. UPON APPROVAL OF SITE STABILIZATION, REMOVE TEMPORARY EROSION CONTROL DEVICES, DRESS OUT AREA AND SEED AND MULCH. PERMANENT EROSION CONTROL DEVICES SHALL BE INSTALLED AND APPROVED BY ENGINEER.
8. THE SEDIMENTATION POLLUTION CONTROL ACT WAS AMENDED IN 2006 TO REQUIRE THAT PERSONS RESPONSIBLE FOR LAND DISTURBING ACTIVITIES INSPECT A PROJECT AFTER EACH PHASE OF THE PROJECT TO MAKE SURE THAT THE APPROVED EROSION AND SEDIMENTATION CONTROL PLAN IS BEING FOLLOWED. RULES DETAILING THE DOCUMENTATION OF THESE INSPECTIONS TOOK EFFECT OCTOBER 1, 2010. THE SELF-INSPECTION PROGRAM IS SEPARATE FROM THE WEEKLY SELF-MONITORING OF THE NPDES STORMWATER PERMIT FOR CONSTRUCTION ACTIVITIES. THE FOCUS OF THE SELF INSPECTION REPORT IS THE INSTALLATION AND MAINTENANCE OF EROSION AND SEDIMENTATION CONTROL MEASURES ACCORDING TO THE APPROVED PLAN. THE INSPECTIONS SHOULD BE CONDUCTED AFTER EACH PHASE OF THE PROJECT, AND CONTINUED UNTIL PERMANENT GROUND COVER IS ESTABLISHED.
9. SEE EROSION DETAILS ON SHEETS 2.04, 2.05, 2.06 AND 2.07.

LEGEND

Font Style Indicates Existing Features

FONT STYLE INDICATES DESIGN FEATURES

SURVEY

	CODE	Existing	PROPOSED
BENCHMARK	BM		
CONCRETE MONUMENT FOUND	CMF		
CONCRETE MONUMENT SET	CMS		
CONTROL POINT	CP		
GEOTECHNICAL BORE	BORE		
IRON PIPE FOUND	IPF		
IRON PIPE SET	IPS		
IRON ROD FOUND	IRF		
IRON ROD SET	IRS		
MAG NAIL FOUND	MNF		
MAG NAIL SET	MNS		
MILE MARKER (HWY)	MM		
MILE MARKER (RR)	MM		
NAIL FOUND	NLF		
NAIL SET	NLS		
PK NAIL FOUND	PKF		
PK NAIL SET	PKS		
PROPERTY LINE			
TEMPORARY BENCHMARK	TBM		
WETLAND FLAG	WLF		

EROSION CONTROL

	CODE	Existing	PROPOSED
CHECK DAM	RCHK		
INLET PROTECTION			
RIP-RAP	RPRP		
LIMITS OF DISTURBANCE			LOD
LIMITS OF DISTURBANCE @ ACCESS EASEMENT			LOD/PAE
LIMITS OF DISTURBANCE @ EDGE OF PAVEMENT		LOD/EP	
LIMITS OF DISTURBANCE @ RIGHT-OF-WAY		LOD/RW	LOD/RW
LIMITS OF DISTURBANCE @ UTILITY EASEMENT		LOD/UE	LOD/PUE
LIMITS OF DISTURBANCE @ TEMPORARY CONSTRUCTION EASEMENT			LOD/TCE
LIMITS OF DISTURBANCE @ TEMPORARY CONSTRUCTION ACCESS			LOD/TCA
RIPARIAN BUFFER - ZONE 1	RBZ1	RBZ1	
RIPARIAN BUFFER - ZONE 2	RBZ2	RBZ2	
SILT FENCE	SF	SF	SF
SILT FENCE OUTLET	SFOLT		
SILT FENCE / TREE PROTECTION FENCE	SF/TPF		SF/TPF
SUPER SILT FENCE	SSF		SSF
TREE PROTECTION FENCE	TPF		TPF
WATTLE	WTTL		
WATTLE BARRIER	WB		

WATER

	CODE	Existing	PROPOSED
AIR RELEASE VALVE IN MANHOLE	ARVMH		
BLOW OFF	BO		
BLOW OFF (TEMPORARY)	BOA		
FIRE HYDRANT	FH		
FIRE HYDRANT VALVE	FHV		
PLUG	PLUG		
MONITORING WELL	MW		
REDUCER / INCREASER	RDCR		
WATER LINE	WL	WL	WL
WATER METER	WM		
WATER VALVE	WV		
YARD HYDRANT	YH		

STORM DRAINAGE

	CODE	Existing	PROPOSED
CATCH BASIN / COMBINATION INLET	CB		
CURB INLET	CI		
DROP INLET	DI		
FLARED END SECTION	FES		
JUNCTION BOX	JB		
DRAINAGE MANHOLE	SDMH		
STORM DRAINAGE PIPE			

SEWER

	CODE	Existing	PROPOSED
AIR RELEASE VALVE IN MANHOLE (FORCE MAIN)	ARVMH		
CLEAN OUT	SSCO		
SEWER FORCE MAIN	FM	FM	FM
SEWER LINE	SS	SS	SS
SEWER MANHOLE	SSMH		
SEWER TEST PORT	TPRT		
PLUG	PLUG		

OTHER

	CODE	Existing	PROPOSED
FINISHED FLOOR ELEVATION, RIGHT OF ALIGNMENT	FFE		
FINISHED FLOOR ELEVATION, LEFT OF ALIGNMENT	FFE		

UTILITIES

	CODE	Existing	PROPOSED
CABLE TV CABLE	CTV	CTV	CTV
CABLE TV HAND HOLE	CHH		
CABLE TV PEDESTAL	CPED		
UNDERGROUND ELECTRICAL CABLE	UGE	UGE	UGE
OVERHEAD ELECTRICAL WIRE	OHE	OHE	OHE
ELECTRICAL HAND HOLE	EHH		
ELECTRICAL MANHOLE	EMH		
ELECTRICAL METER	EM		
ELECTRICAL PEDESTAL	EPED		
FIBER OPTIC CABLE	FOC	FOC	FOC
FIBER OPTIC HAND HOLE	FOHH		
GAS LINE	GL	G	G
GAS METER	GM		
GAS VALVE	GV		
GUY / ANCHOR WIRE	GUY		
LIGHT POLE / AREA LIGHT	LP		
POWER POLE	PP		
STEAM MANHOLE	STMH		
TELECOMMUNICATIONS CABLE	COM	COM	COM
TELECOMMUNICATIONS MANHOLE	TMH		
TELEPHONE CABLE	COM	COM	COM
TELEPHONE HAND HOLE	THH		
TELEPHONE PEDESTAL	TPED		
TRAFFIC SIGNAL BOX	TFCB		
TRAFFIC SIGNAL POLE	TFCP		
TRANSFORMER	TRNS		
UTILITY MARKER / WARNING POST	WIT		
UTILITY POLE	UP		

EXHIBIT A

3 Pages

Norfolk Southern Railway Company

Accompanying Agreement With

Piedmont Triad Regional Water Authority (PTRWA)

Activity No.:	1326600	**E.S.:**	875+38
Division:	Blue Ridge	**Mile Post:**	16.76 - EM
Val Sec:	29	**Map No.:**	5
City:	Randleman	**County:**	Randolph
State:	North Carolina		
Lat:	35.8043013	**Long:**	-79.8283665

All work to be performed in accordance with the latest approved Norfolk Southern NSCE-4 and NSCE-8 Specifications

BLASTING NOT PERMITTED **DATED 03/27/2025**

FINAL DRAWING
NOT RELEASED FOR CONSTRUCTION

REVISIONS x / xx / xxxx

1 REVISION NOTE

Wooten
300 S. Main Street • Winston-Salem, NC 27101
(803) 722-5326 • thewootencompany.com
License Number: F-0115

PIEDMONT TRIAD REGIONAL WATER AUTHORITY
RANDOLPH COUNTY NORTH CAROLINA
WATER LINE PTRWA – ASHEBORO

ABBREVIATIONS, GENERAL NOTES AND LEGEND

CRITEK ENGINEERING GROUP
4900 KOGER BLVD., SUITE 180, GREENSBORO, NC 27407
T: (336) 348-1889 | WWW.CRITEKGROUP.COM | LICENSE: C-4061

811 Know what's below. 811 before you dig.

NORTH CAROLINA PROFESSIONAL SEAL 047007 ENGINEER JOHN C. GREY
02/18/2025

DESIGNED BY:
DRAWN BY:
CHECKED BY:
PROJECT NO.: 3190-L
DATE: NOVEMBER 2024
SCALE:

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

FINAL DRAWING
FOR REVIEW PURPOSES ONLY
NOT RELEASED FOR CONSTRUCTION

C-0.02

T:\Projects\Randolph_County-3190\L-Waterline PTRWA-Asheboro_CADD\DesignModels\COVER SHEET.dwg BHUEY 2/4/2025 2:05 PM

Xref .\3405 B Titleblock 24x36.dwg

Docusign Envelope ID: 5D88D029-4C2C-4455-B94E-ACD9367FBA78

PIPE DATA SHEET

	CARRIER PIPE	CASING PIPE
CONTENTS TO BE HANDLED	Water	
MAX. ALLOWABLE OPERATING PRESSURE	250 psig	
NOMINAL SIZE OF PIPE	16-inch	30-inch
OUTSIDE DIAMETER	17.4 inches	30 inches
INSIDE DIAMETER	16.8 inches	29 inches
WALL THICKNESS	0.3 inches	0.5 inches
WEIGHT PER FOOT	56 lbs	158 lbs
MATERIAL	Ductile Iron	Steel
PROCESS OF MANUFACTURE	Cast	Spiral Welded
SPECIFICATION	AWWA C150/A21.50, AWWA C151/A21.51	ASTM A-139, Grade B, Fy = 35 ksi
GRADE OR CLASS (Specified Minimum Yield Strength)	CL250	ASTM A-139, Grade B, Fy = 35 ksi
TEST PRESSURE	150 psig	
TYPE OF JOINT	Restrained (Megalug)	Welded
TYPE OF COATING	Interior: Cement-mortar with seal coat	
DETAILS OF CATHODIC PROTECTION		
DETAILS OF SEALS OR PROTECTION AT END OF CASING		1/8" thick synthetic rubber wrap-around
CHARACTER OF SUBSURFACE MATERIAL		
APPROXIMATE GROUND WATER LEVEL		
SOURCE OF INFORMATION ON SUBSURFACE CONDITIONS		

Proposed method of installation (refer to NSCE-8 Specification):

- [X] Bore & Jack
- [ ] Jacking
- [ ] Tunneling (with Tunnel Liner Plate)
- [ ] Directional Bore/Horizontal Direction Drilling – Method A
- [ ] Directional Bore/Horizontal Direction Drilling – Method B
- [ ] Open Cut – *All installations directly under any track must be designed as a bored installation. Open cut installations will be considered on a case-by-case basis by Norfolk Southern's Division Superintendent at the time of installation.*
- [ ] Other – Please Specify: _____

BLUE RIDGE | DANVILLE | ASHEBORO BRANCH | HIGH POINT-RANDLEMAN

15EM — 5,262' — 16EM — 5,129' — 17EM — 5,082'

03/05/2024

TIMBER & SURFACING

T&S-11/17
S-01/21

RAIL

12NWF136S
12NWF138S
08RWF132S
08RWF132S
17RW132S
17RW132S

TRAFFIC DENSITY MGT

→ 0.8(1.3)
← 0.5

V-29-NC(CRN)

(RANDLEMAN)
M19

017.19-4MSB-256'

N
W E
S

TRACK LAYOUT

LINE SEGMENT

0295

722439R	CLACKERD METAL	722441S	722442Y	722443F 929635Y	722445U 722446B	722447H	722448P	722449W
PVT-CRANFORD METAL		PLAINFIELD RD	COURT HSE RD-SR 1513	DUPLICATORS WAYNE STEEL	MIDSTATE PAPERBOX PRIVATE	HEATH DAIRY-SR 1511	US 311	I-73, US 220

17.5-EM=20.5-EM

CURVATURE ALIGNMENT ELEVATION

2.0R	3.5R	4.1L	4.2R
1.00	1.00	1.50	1.50

MAINTENANCE SPEED (CURVE)

25

GRADE

-0.13 +0.15 +0.72 +1.00 +0.64 -0.08 -0.44 -0.60 -0.93 -1.10 +0.67 -1.11 0.00 -0.81 +0.60 -0.67 +0.87 +0.57

Sheet 62 EM_15_20

CHANGE ORDER NO 1

Owner: Piedmont Triad Regional Water Authority	Owner's Project No.: Owner's Project ID
Engineer: The Wooten Company	Engineer's Project No.: 3190-L
Contractor: Contractor's Legal Name	Contractor's Project No.: 3190-L
Project: Waterline PTRWA - Asheboro	
Contract Name: Waterline PTRWA - Asheboro	
Date Issued:	Effective Date of Change Order:

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

Description:

1.

Attachments:

1.

Change in Contract Price	**Change in Contract Times** [State Contract Times as either a specific date or a number of days]
Original Contract Price: $ Contract Price	Original Contract Times: Substantial Completion: Days to Sub. Comp. Ready for final payment: Days to Completion
Select from previously approved Change Orders No. 1 to No. : ____ $_____	Select from previously approved Change Orders No.1 to No. ____ : Substantial Completion: _____ Ready for final payment: _____
Contract Price prior to this Change Order: $ _____	Contract Times prior to this Change Order: Substantial Completion: _____ Ready for final payment: _____
Select this Change Order: $_____	Select this Change Order: Substantial Completion:_____ Ready for final payment: _____
Contract Price incorporating this Change Order: $ _____	Contract Times with all approved Change Orders: Substantial Completion: _____ Ready for final payment: _____

Recommended by Engineer (if required)

By:_____
Title: _____
Date: _____

Accepted by Contractor

By:_____
Title: _____
Date: _____

Authorized by Owner

By:_____
Title: _____
Date: _____

Approved by Funding Agency (if applicable)

By:_____
Title: _____
Date: _____

END OF SECTION

2018 EJCDC® C-941, Change Order EJCDC® C-941, Change Order, Rev.1.

SECTION 01 11 00

SUMMARY OF WORK

PART 1 GENERAL

1.01 WORK COVERED BY CONTRACT DOCUMENTS

A. Work described in this Project Manual includes the provision of labor, materials, equipment, and services required to complete the Water Line PTRWA - Asheboro for Piedmont Triad Regional Water Authority, North Carolina.

1.02 CONTRACTS

A. Project construction will be let under one Contract with construction including, but not limited to, the following major work items:
   1. Water Mains
      a. Approximately 18,241 LF of 16-inch DIP water main with Meter vault and sitework and associated appurtenances
      b. approximately 567 LF of 20-inch HDPE water main installed via HDD and associated appurtenances

1.03 WORK SEQUENCE

A. Construction Progress Schedule, as required in Section 01 33 00, Submittal Procedures, shall indicate the anticipated items and times that the Work will interfere with normal facility operation.

B. Coordinate with Owner prior to making connections to existing system and during all flushing operations.

1.04 CONTRACTOR USE OF SITE

A. Work is located within Rights-of-way of the NC Department of Transportation and Norfolk Southern Railroad. Requirements of the owners of the rights-of-way must be complied with and specifically as required in the permits attached to Section 00 73 00, Supplementary General Conditions.

B. Contractor shall provide his own staging area as necessary for his Work beyond the easements and work areas indicated on the Drawings.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 01 22 00

UNIT PRICES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Delineation of measurement and payment criteria applicable to Work performed under Contract by the unit price payment method.

1.02 FIELD MEASUREMENT

A. Take measurements and compute quantities for submittal of the monthly pay request unless specified otherwise in the measurement paragraphs as indicated in this Section.

1.03 CHANGE IN QUANTITIES

A. Increase in the quantity of a bid item above what is indicated in the Bid Form shall only be made by a Change Order as required by the Contract Documents.

B. A final adjusting Change Order shall be made for adjustment of the actual quantities installed prior to submittal of the final pay request.

1.04 GENERAL

A. Items with a "(X)" in the title of the following bid items represents the size or depth as indicated on the Bid Form.
   1. (X)-inch: (X) is the place holder for pipe size.

B. Method of measurement for the individual Bid Items shall be as specified below.

C. Payment for each item shall be in accordance with the Contract Unit Price times the number of units installed in accordance with the Contract Documents.

D. Work for each bid item shall include, but not be limited to, the work listed below and the labor, materials, equipment, and services required and reasonably implied by the Contract Documents for a complete installation.

1.05 MOBILIZATION (BID ITEM 1)

A. Measurement shall not be made for this item.

B. Work shall include startup administrative cost including, but not limited to, mobilization, bonds, insurance, shop drawing submittal, project signage, video and photographic records, and construction trailers.

C. General office administration throughout the Project construction shall include, but not be limited to, pay requests, as-built documentation, and coordination of Work with other entities as appropriate shall be included in the individual unit price items.

D. Bid Price for Mobilization shall not exceed 3 percent of the total bid. Half of the mobilization may be requested on the first pay request and the remainder on the second.

1.06 UTILITY PIPING (BID ITEMS 2 & 3)

A. Measurement: Measure horizontally indicated on the Drawings for the various types and sizes of pipes installed.
   1. (X)-inch (material) Water Main: No deduction will be made for space occupied by valves or fittings.

B. Work shall include, but not be limited to (unless specifically noted otherwise on the Bid Form and this specification Section), the following:
   1. Clearing and grubbing where necessary.
   2. Traffic control.
   3. Temporary removal and restoration or temporary support of, but not limited to, existing mail boxes, driveway culverts (12-inch and smaller culverts shall be replaced with 15-inch RCP and contractor shall be paid for material only, deteriorated culvert piping shall be replaced at material cost for like size culverts) signs, fences, shrubs, plants (under 6 feet in height), guard rails, power and telephone poles.
   4. Excavating, shoring and bracing where required, dewatering as required, installing, backfilling (including Class I material as specified for the pipe bedding, haunching, and initial backfill).
   5. Installation of warning / identification tape over utilities.
   6. Installation of tracer wire on non-metallic utilities.
   7. Temporary support and protection of existing underground facilities.
   8. Flushing and testing.
   9. Repair to damaged new and existing utilities.
   10. Cutting and removal of existing paved surfaces. Patching of existing paved surfaces shall be paid as indicated in the paragraph, “Patching of Asphalt and Concrete Pavement.”
   11. Grade disturbed areas to original surface profile prior to seeding.
   12. Clean up and seeding.

C. Water: Work shall include disinfection.

D. Payment: The first Application for Payment will be approved based on the utilities installed during the agreed upon payment period without testing. Subsequent Application for Payments shall not be approved by the Engineer unless utilities installed during the previous payment period have passed the specified tests and clean up and seeding is complete.

1.07 BID ITEMS LISTED BY THE UNIT "EACH" (EA)

A. Measurement: By the number installed.

B. Water work items:
   1. (BID ITEM 4) (X)-inch Valve and Box: Valve, valve box, concrete setting pad, concrete top collar, and valve markers as shown in contract.
   2. (BID ITEM 5) Fire Hydrant Assembly: Fire hydrant, hydrant tee, hydrant elbow, standpipe extension(s), concrete base, blocking, bridle rods and rod collars, the 6 inch gate valve (including valve box, concrete setting pad and concrete top collar) and 6 inch pipe from the water main to hydrant.

3. (BID ITEMS 6 & 7) Connect New (X) inch Water Main to Existing (X) inch Water Main: Includes excavation, cutting existing line, water removal from existing line, repair clamp, plug, miscellaneous fittings, proper thrust restraint, disinfection, backfill, compaction, pavement cutting and removal where necessary and all other appurtenances for a complete connection to the existing line. Payment for valve and box and length of pipe will be paid under applicable unit prices. This bid item shall not be paid when the connection includes a tapping sleeve or tapping saddle.
4. (BID ITEM 8) 6-inch Blowoff Assembly: Main size plug with 6 inch tap, 6 inch gate valve (including valve box, concrete setting pad and top collar), 6 inch pipe from main line plug to discharge.
5. (BID ITEM 9) Air Release Valve in Manhole: Air release valve, pipe tap, and manhole (including stone base, frame and cover).

C. Erosion control work items:
1. (BID ITEM 10) Wattle Check Dam: Coir wattle with staples and stakes, or riprap with #5 washed stone, maintenance during construction, and final removal and clean up.
2. (BID ITEM 11) Catch Basin Inlet Protection: Silt fence installation with #5 washed stone, maintenance during construction, and final removal and clean up.
3. (BID ITEM 12) Silt Fence Outlet: Silt fence installation with #5 washed stone, maintenance during construction, and final removal and clean up.
4. (BID ITEM 13) Temporary Construction Entrance: Excavation, washed stone, maintenance during construction, and final removal and cleanup.

D. Miscellaneous Items
1. (BID ITEM 14) Signage at Railroad Crossing: Post, Setting of post, Signage with indicated information.

1.08 XX-INCH RESTRAINED JOINT DIP WATER LINE W/ XX-INCH STEEL ENCASEMENT BORE & JACK (WITHIN NCDOT R/W)(BID ITEM 15)

A. Measurement: Along the centerline of the various sizes of steel encasement pipes installed.

B. Work: Excavation and backfilling for bore pit, encasement pipe, and carrier pipe installed in encasement pipe with spacers and casing seals. Include costs for the provision of bonds, insurance and inspection fees required by the respective agency or authority in charge of inspection of the encasement pipe.

1.09 XX-INCH RESTRAINED JOINT DIP WATER LINE W/ XX-INCH STEEL ENCASEMENT BORE & JACK (WITHIN NCDOT CA R/W) (BID ITEM 16)

A. Measurement: Along the centerline of the various sizes of steel encasement pipes installed.

B. Work: Excavation and backfilling for bore pit, encasement pipe, and carrier pipe installed in encasement pipe with spacers and casing seals. Include costs for the provision of bonds, insurance and inspection fees required by the respective agency or authority in charge of inspection of the encasement pipe.

1.10 (BID ITEM 17) DUCTILE IRON FITTINGS

A. Measurement: By the pound. Poundage shall be based on the number and type of fittings installed times the weight of each type of fitting. Fitting weights shall be based

on those provided in AWWA C110 for the applicable fitting type. Note that the measured weight for billing purposes in not to include accessory weights. A copy of the shipping invoice shall be provided to the Engineer.

B. Work: Complete installation of Fitting.

1.11 ROCK EXCAVATION (BID ITEM 18)

A. Measurement
   1. Pipe: Measure along the centerline of the trench, times the depth from the top of rock profile to the specified depth below the pipe, times the pipe OD plus two feet.
   2. Structure: Measure two feet beyond the outside of the structure (excluding extended base) and to a depth of one foot greater than the bottom of the structure.
   3. General: Take measurements in the presence of the Engineer. Maintain daily log sheets of measured quantities. Log sheets must be signed by the Engineer and submitted with payment request. Payment shall not be made for quantities that have not been field verified by the Engineer.

B. Work: Complete removal and disposal of excavated rock material including, but not limited to, drilling, blasting, monitoring, excavating, loading, hauling, and properly disposing of excavated material. Providing specified material for backfilling shall include, but not be limited to, material, loading, hauling, placing and compacting.

1.12 ASPHALT PAVEMENT REPAIR (NON NCDOT) (BID ITEM 19)

A. Measurement: Measure by the square yard along centerline of pavement cut times the pipe OD plus eight feet. Payment shall not be made for pavement repair required due to excessive open cut caused by Contractor.

B. Work: Backfilling, compacting, stone sub-base, asphalt at the depths as specified.

1.13 CONCRETE PAVEMENT REPAIR (BID ITEM 20)

A. Measurement: Measure by the square yard along centerline of pavement cut times the pipe OD plus eight feet. Payment shall not be made for pavement repair required due to excessive open cut caused by Contractor.

B. Work: Backfilling, compacting, stone sub-base, concrete at the depths as specified.

1.14 GRAVEL DRIVEWAY REPAIR (BID ITEM 21)

A. Measurement: Measure by the square yard along centerline of pavement cut times the pipe OD plus eight feet for stone placed and compacted to a depth of 6 inches. Loss of material due to inadequate backfill compaction shall be replaced at no additional cost. Engineer shall approve location and dimension of repair area to be used prior to placement. Payment shall not be made for pavement repair required due to excessive open cut caused by Contractor.

B. Work: Stone, hauling, placement, and compacting.

1.15 WATTLE SILT BARRIER (SILT SOCK) (BID ITEM 22)

A. Measure along the base of the silt sock installed in linear feet.

B. Work: Staking, trenching, installation of silt sock, maintenance during construction, removal and clean up.

1.16 SILT FENCE (BID ITEM 23)

A. Measure along the base of the silt fence installed in linear feet.

B. Work: Posts, wire mesh, fabric, base trench, stone, and maintenance during construction, removal and clean up.

1.17 (X)-INCH FUSIBLE HDPE WATERMAIN BY HORIZONTAL DIRECTIONAL DRILL (BID ITEM 24)

A. Measurement: No measurement will be made for this item as it shall include one complete directional drill installed force main.

B. Work: Complete installation from station to station as indicated on the Drawings including, but not limited to, clearing, access to launching and target pits, excavating, installing, horizontal directional drilling, backfilling, off-site borrow material, compacting, testing, flushing, disinfection, pipe material (including HDPE, RJDIP, and DI piping, MJ adapter, reducer, and fittings), polyethylene wrap, valves, transition to open cut installation, as necessary, seeding, mulching and tacking, associated erosion control measures, and all labor, materials, and accessories required for a complete installation. No payment shall be made for failed attempts to install pipe by directional drill and no adjustment will be made to the lump sum price due to the HDD installed is longer than shown on the drawings.

1.18 CLASS B RIPRAP FOR OUTLET STABILIZATION (BID ITEM 25)

A. Measurement shall be the length and width of class "B" rip rap actually installed in square yards.

B. Payment for class "B" rip rap shall be in accordance with the Contract unit price per square yard for the rip rap furnished and installed as required by the Contract Documents. Payment shall be for all the labor, material and accessories required for a complete installation including, but not be limited to, the cost of fine grading, bedding stone, and class "B" rip rap.

C. Work: Filter fabric under stone, stone, hauling, and placement.

1.19 TEMPORARY STREAM CROSSING (BID ITEM 26)

A. Measurement: Measurement for one stream crossing installed.

B. Work: Complete installation at each location as indicated on the Drawings including, but not limited to, the cost of the clearing and cleanup, installation and removal of class B riprap, polyethylene fabric, #57 stone, temporary CMP or stream bypass pumping, filter fabric and dewatering basin. Stream crossing shall provide working area without free flowing water and shall prevent sedimentation of the stream.

1.20 EROSION CONTROL MATTING (BID ITEM 27)

A. Measurement: Temporary ditch liner shall be measured in square yards.

B. Payment for the ditch liner shall be in accordance with the Contract unit price per square y installed. Payment shall be for the labor, material and accessories required for a complete installation including, but not limited to, fine grading of ditch, liner material, and maintenance during construction.

1.21 CONCRETE THRUST BLOCKING (BID ITEM 28)

A. **Measurement: Measure by the cubic yard of concrete delivered and placed in the trench for blocking.**

B. Work: Excavation, form work, concrete, placement, and backfilling.

1.22 METER VAULT SITE (BID ITEM 29)

A. Measurement: Measurement for one station installed.

B. Work: Complete installation including, but not limited to, piping, valves, precast vault, electrical control and power wiring and conduits, site work (including access road, site piping, water line to connection at water main, fencing, guard rail, and electrical service), excavation, backfilling, grading, compacting, start up, and testing. Work shall also include assisting with testing of SCADA system.

1.23 XX-INCH TREE REMOVAL (BID ITEM 30)

A. Measurement: By the number removed.

B. Work: Furnish all labor, equipment, and materials necessary to remove designated trees, including cutting, felling, and disposal of all tree parts. Work includes grinding or removal of stumps to a specified depth below grade, clearing debris, and restoring the site to a clean and safe condition. All operations shall comply with applicable safety standards and local regulations

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 01 31 13

PROJECT COORDINATION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. This Section specifies administrative and supervisory requirements necessary for Project coordination including, but not necessarily limited to:
   1. Coordination.
   2. Administrative and supervisory personnel.
   3. General installation provisions.
   4. Cleaning and protection.

1.02 GENERAL COORDINATION REQUIREMENTS

A. Responsibilities of Contractor:
   1. Coordinate construction activities for the Project to assure efficient and proper installation of each part of the Work.
   2. Where availability of space is limited, coordinate installation of components to assure maximum accessibility for maintenance. Make adequate provisions to accommodate components scheduled for later installation.
   3. Where necessary, prepare memoranda for distribution to each party involved outlining special procedures required for coordination. Include such items as required notices, reports, and attendance at meetings. A copy of all memoranda shall be submitted to the Engineer.

B. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities to avoid conflicts and ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:
   1. Preparation of schedules.
   2. Installation and removal of temporary facilities.
   3. Delivery and processing of submittals.
   4. Progress meetings.
   5. Installation meetings.
   6. Project Close-out activities.

C. Conservation: Coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water, and materials.
   1. Salvage materials and equipment involved in performance of, but not actually incorporated in, the Work. Refer to other sections for disposition of salvaged materials that are designated as Owner's property.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 01 31 19

PROJECT MEETINGS

PART 1 GENERAL

1.01 MEETINGS

A. Pre-construction conference shall be held prior to the beginning of the Work.

B. Construction progress meetings shall be held monthly.

C. Project close-out conference shall be held during the final phases of the Work.

D. Engineer may schedule additional meetings.

E. Meetings scheduled by the Engineer shall be held at the Randleman Regional Reservoir PTRWA Office Conference Room.

F. Contractor shall notify the individual indicated as contact person in the NC DOT Encroachment Agreement for all meetings.

G. Contractor's project superintendent shall attend meetings.

H. Notify suppliers and subcontractors to attend meetings as appropriate or as required by Engineer.

I. Contractor shall schedule pre-installation conferences as required in the individual specification sections.

J. Notify Engineer of project meetings scheduled by the Contractor.

K. Engineer will schedule and administer meetings throughout the progress of the Work, except for meetings held by the Contractor for normal coordination of the Work.

L. Meeting agenda shall include, but not be limited to, the following: Project Administration, Submittals, Construction Schedules and Methods, Safety and Health Regulations, Project Coordination, Payment Application, Change Orders, and Site Inspections.

M. Engineer will prepare agenda with copies to participants, preside at meetings, prepare minutes and distribute to participants for meetings scheduled by the Engineer.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOTUSED

END OF SECTION

SECTION 01 33 00

SUBMITTAL PROCEDURES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. This Section includes, but is not limited to, requirements for the following:
   1. Submittal procedures.
   2. Construction progress schedule.
   3. Project record documents.
   4. Certificates of compliance.
   5. Catalog data.
   6. Shop drawings.

1.02 SUBMITTAL PROCEDURES

A. Submittals shall be uploaded to the Project Sharefile™ and after review shall be downloaded. Contractor will be provided access permission upon Notice to Proceed.

B. Submittals shall be numbered as required by the Wooten submittal numbering convention that will be provided at the Notice to Proceed.

C. Cover letter for each submittal package shall list the following:
   1. Contractors name:
   2. Owners name: Piedmont Triad Regional Water Authority
   3. Project name: Water Line PTRWA - Asheboro
   4. Wooten Job No.: 3190-L

D. Individual submittals shall each be listed by the following information:
   1. Submittal reference no.
   2. Specification section number.
   3. Drawing and detail number when appropriate.
   4. Equipment.
   5. Type submittal.
   6. Supplier.
   7. Manufacturer.

E. Contractor shall provide a submittal log listing the submittals required and the expected dates for submittal.

F. Apply Contractor's stamp to each submittal, signed or initialed and dated, certifying that Contractor has reviewed submittal for conformance with requirements of Contract Documents, and has coordinated submittal with related work.

G. Schedule submittals to expedite Project, and deliver to coordinate submission of related items. Allow a minimum of fifteen (15) working days for Engineer's review.

H. Identify variations from Contract Documents and Product limitations as they relate to the satisfactory performance of the Project.

I. Provide space for Contractor and Engineer review stamps.

J. Revise and resubmit submittals as required; identify changes made since previous submittal.

K. Distribute copies of reviewed submittals to concerned parties. Instruct parties to promptly report inability to comply with provisions.

L. Work requiring submittal review by Engineer shall not be started until review has been obtained.

M. Engineer's review of submittals shall not relieve Contractor of responsibility for complete compliance with Contract Documents.

1.03 ADMINISTRATIVE SUBMITTALS

A. Construction Progress Schedule
   1. Submit five (5) copies of the initial progress schedule 15 days after date of Owner-Contractor Agreement. One copy shall be returned to the Contractor.
   2. Progress schedule shall be, as a minimum, a horizontal bar chart with a separate line for each major section of Work. Identify the first workday of each week.
   3. Show complete sequence of construction by activity, identifying Work of separate stages and other logically grouped activities. Indicate the early and late start, early and late finish, float dates, and duration.
   4. Indicate the expected monthly pay requests.
   5. Submit revised schedule with each Application for Payment as required for updating, identifying changes since previous version. Indicate estimated percentage of completion for each item of Work at each submission.
   6. Indicate submittal dates required for critical shop drawings, product data, samples, and product delivery dates.

B. Project Record Documents
   1. Maintain on site, one set of the following record documents; record actual revisions to the Work:
      a. Contract Drawings.
      b. Project Manual.
      c. Addenda.
      d. Change Orders and other Modifications to the Contract.
      e. Reviewed submittals.
   2. Store Record Documents separate from documents used for construction.
   3. Record information concurrent with construction progress.
   4. Specifications: Legibly mark and record at each Product section description of actual Products installed, including the following:
      a. Manufacturer's name and product model and number.
      b. Product substitutions or alternates utilized.
      c. Changes made by Addenda and Modifications.
   5. Record Documents and Shop Drawings: Legibly mark each item to record actual construction including:
      a. Measure elevations of structures in relation to survey bench mark.
      b. Measure and reference horizontal and vertical locations of underground utilities and appurtenances to existing permanent surface improvements that are indicated on the Drawings.
      c. Field changes from construction Drawings.
      d. Details not on original Contract Drawings.

6. Submit documents to Engineer with final Application for Payment.

1.04 TECHNICAL SUBMITTALS

A. General
   1. Submit the following as required by the individual sections of the technical specifications.

B. Certificates of Compliance
   1. Certificates shall certify that the Products delivered to the project are in conformance with the specifications.
   2. Certificates may be recent or previous test results on Product, but must be acceptable to Engineer.
   3. Certification shall not relieve the Contractor of responsibility for complying with requirements of the specifications.

C. Catalog Data
   1. When shop drawings are not required, the catalog data shall include the following as a minimum:
      a. Parts schedule that identifies the materials to be used in each of the various parts.
      b. Sufficient detail to serve as a guide for assembly and disassembly of the product and to serve as guide for ordering parts.
   2. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information unique to this Work in the Shop Drawing submittal.

D. Shop Drawing
   1. Shop drawings shall consist of drawings, diagrams, illustrations, schedules, performance charts, brochures and other data, prepared specifically for a portion of the Work.
   2. Shop drawings shall indicate the type, size, quantity, arrangement, location, mode of operation, component materials, utility connections, wiring and control diagrams, anchorage's, supports, factory applied coatings, and other information necessary to ensure satisfactory fabrication, installation and operation of the completed Work.
   3. Shop drawings shall establish the actual detail of manufactured or fabricated items, indicate proper relation to adjoining work, amplify design details of mechanical and electrical equipment in proper relation to physical spaces in the structure, and incorporate minor changes to design and construction to suit actual requirements.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 01 45 00

QUALITY CONTROL

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Quality assurance and control of installation.

1.02 QUALITY ASSURANCE/CONTROL OF INSTALLATION

A. Manufacturer shall have the minimum number of years of proven successful experience required in each section in the design, manufacture, and servicing of Products specified.

B. In lieu of the required experience, manufacturer may provide a cash deposit or bond equal to the cost of the Product, but pro-rated to the number of years of actual experience.

C. Products from a manufacturer who does not meet the experience requirements must meet technical requirements.

D. Monitor quality control over suppliers, manufacturers, Products, services, site conditions, and workmanship, to produce Work of specified quality.

E. Comply fully with manufacturers' instructions, including each step in sequence.

F. Should manufacturers' instructions conflict with Contract Documents, request clarification from Engineer before proceeding.

G. Comply with specified standards as a minimum quality for the Work except when more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.

H. Perform work by persons qualified to produce workmanship of specified quality.

I. Secure Products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, or disfigurement.

1.03 INSPECTION AND TESTING LABORATORY SERVICES

A. Owner will employ, and pay for services of an independent firm to perform inspection and testing for Soil and Concrete at their discretion.

B. The same independent firm shall perform retesting. Contractor shall pay for retesting required by the failure of the initial test to meet the requirements of the specifications.

1.04 CONTRACTOR RESPONSIBILITIES

A. Unless specified otherwise, deliver to laboratory at designated location, adequate samples of materials proposed to be used that require testing. The proposed mix designs shall be included with delivery.

B. Cooperate with laboratory personnel, and provide access to the Work and to manufacturer's facilities as specified.

C. Provide incidental labor and facilities to provide access to Work to be tested, to obtain and handle samples at the site and at source of products to be tested, to facilitate tests and inspections, storage, and curing of test samples.

D. Notify Engineer and laboratory 24 hours prior to expected time for operations requiring inspection and testing services.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 01 50 00

TEMPORARY FACILITIES AND CONTROLS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Temporary Utilities: Electricity, lighting, water, and sanitary facilities.

B. Work on public right-of-way.

C. Traffic control.

D. Temporary Controls: Barriers, water control, dust control, erosion and sediment control , and protection of the Work.

E. Construction Facilities: Progress Cleaning, access roads, and parking.

1.02 TEMPORARY UTILITIES

A. Electricity
   1. Provide and pay for required power service for construction from Utility source.

B. Lighting
   1. Provide and maintain lighting for construction operations as required by Contractor.
   2. Provide and maintain lighting to exterior staging and storage areas after dark for security purposes as required by Contractor.

C. Water
   1. Contractor shall be required to provide hauling as required for Contractor's water use.

D. Sanitary Facilities
   1. Provide and maintain required facilities and enclosures as necessary to comply with the laws and ordinances of the authority having jurisdiction and the State of North Carolina.
   2. Each Contractor shall provide the above sanitary facilities for all contractors, sub-contractors, Owner and Engineer at the Project Site.

1.03 WORK ON PUBLIC RIGHTS-OF-WAY

A. Work on this Project is along rights-of-way under jurisdiction of the following N.C. Department of Transportation (NC DOT) offices and Owner:
   1. Work in Randolph County:
      a. Division No. 8, District No. 1
      b. RJ Monroe, District Supervisor
      c. 300 DOT Drive, Asheboro, 27205
      d. 336-318-4000

B. Work shall comply with requirements of the Encroachment Agreement(s) and Driveway Permit(s) as attached to Project Supplementary Conditions.

C. Post Bonds as required by Encroachment Agreement(s).

D. Prior to start of Work notify the Office of the N.C. Department of Transportation as indicated in the encroachment agreement and driveway permit. Also notify the Owner.

E. Work shall conform to the requirements and be subject to the approval of the above agency(ies).

F. Submit letter to the above District Supervisor(s) when work is complete as required by the Encroachment Agreement.

G. Submit letter of approval for completed Work from the above agency(ies) with Final Payment Request.

H. Clean rights-of-way as work progresses and daily.

I. Power broom existing pavement as work progresses.

J. Work shall be in accordance with the latest edition of the N.C. Division of Highways, "Policies and Procedures for Accommodating Utilities on Highway Right-of -Way."

K. Consult with the above agency(ies) in establishing public thoroughfares to be used for haul routes and site access.

L. Confine construction traffic to designated haul routes.

M. Provide traffic control along haul routes to regulate traffic and to minimize interference with public.

N. Provide and maintain access to fire hydrants, free of obstructions.

1.04 TRAFFIC CONTROL

A. On public and private road rights-of-way provide traffic control devices when construction encroaches within the right-of-way. Devices shall include, but not be limited to, cones, drums, flares, warning signs, temporary pavement marking, warning lights, and flagman.

B. Traffic control devices shall provide the following:
   1. Protection of motorists, pedestrians and workers from accident hazards.
   2. Advance public information of proposed work sites.
   3. Establishment of an orderly and safe flow of traffic and to minimize traffic congestion.
   4. Provision of access for emergency vehicles.

C. Traffic control devices shall be used in accordance with the latest edition of the NC DOT "Manual on Uniform Traffic Control Devices for Streets and Highways (MUTCD)."

D. Provide personnel trained in traffic control.

1.05 TEMPORARY CONTROLS

A. General
   1. Temporary controls shall be the responsibility of each Contractor for their respective work unless noted otherwise.

B. Barriers
   1. Provide barriers to prevent unauthorized entry to construction areas for the safety of the public, the protection of the work, and to protect existing facilities and adjacent properties from damage from construction operations.
   2. Provide barricades required by agency for public rights-of-way and for public access to existing buildings.
   3. Provide protection for plant life designated to remain. Replace damaged plant life.
   4. Protect vehicular traffic, stored materials, site, and structures from damage.

C. Water Control
   1. Grade site to drain. Provide, operate, and maintain pumping equipment to maintain excavations free of water.
   2. Protect site from running water.

D. Dust Control
   1. Execute Work by methods designed to minimize raising dust from construction operations.
   2. Provide positive means to prevent airborne dust from dispersing into atmosphere.

E. Erosion and Sediment Control
   1. Provide Erosion and Sediment Control as indicated on the Drawings and specified in Section 31 25 00, Erosion Control.

F. Protection of Installed Work
   1. Protect installed Work and provide special protection where specified in individual specification Sections.
   2. Provide temporary and removable protection for installed Products. Control activity in immediate work area to minimize damage.
   3. Prohibit traffic from landscaped areas.

1.06 CONSTRUCTION FACILITIES

A. General
   1. Construction facilities shall be the responsibility of each Contractor for their respective work unless noted otherwise.

B. Access Roads
   1. General Contractor shall construct and maintain temporary drives as necessary to access public thoroughfares and existing drives to serve the construction area.
   2. Provide means of removing mud from vehicle wheels before entering streets.

C. Parking
   1. When site space is not adequate, arrange for temporary off site surface parking areas to accommodate construction personnel.
   2. Do not allow vehicle parking in existing right-of-way or to block existing drives.
   3. Do not allow vehicle parking on private property without prior approval.

D. Progress Cleaning
   1. Maintain areas free of waste materials, debris, and rubbish. Maintain site in a clean and orderly condition.

2. Remove waste materials, debris, and rubbish from site periodically and dispose off site.

1.07 REMOVAL OF UTILITIES, FACILITIES, AND CONTROLS

A. Remove temporary above grade or buried utilities, equipment, facilities, and materials, prior to final Inspection.

B. Clean and repair damage caused by installation or use of temporary work.

C. Restore existing facilities used during construction to original condition. Restore permanent facilities used during construction to specified condition.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 01 60 00

PRODUCT REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Products.

B. Transportation and handling.

C. Storage and protection.

D. Product options.

E. Substitutions.

1.02 PRODUCTS

A. Products: Means new material, machinery, components, equipment, fixtures, and systems forming the Work. Does not include machinery and equipment used for preparation, fabrication, conveying, and erection of the Work. Products may also include existing materials or components specified in the Contract Documents for reuse.

1.03 TRANSPORTATION AND HANDLING

A. Transport and handle Products in accordance with manufacturer's instructions.

B. Ship fabricated assemblies in largest sections permitted by carrier regulations and properly marked for ease of field erection.

C. Promptly inspect shipments to assure that Products comply with specified requirements, quantities are correct, and Products are undamaged.

D. Provide equipment and personnel to handle Products by methods to prevent soiling, disfigurement, or damage.

1.04 STORAGE AND PROTECTION

A. Keep on site storage of material to a minimum.

B. Store and protect Products in accordance with manufacturer's instructions in unopened original packages, with seals and labels intact and legible. Store sensitive Products in weather-tight, climate-controlled enclosures.

C. For exterior storage of fabricated Products, place on sloped supports, above ground.

D. Provide off site storage and protection when site does not permit on site storage.

E. Cover Products subject to deterioration with impervious sheet covering. Provide ventilation to avoid condensation.

F. Store loose granular Products on solid flat surfaces in a well-drained area. Prevent mixing with foreign matter.

G. Arrange storage of Products to permit access for inspection. Periodically inspect to assure Products are maintained under specified conditions.

1.05 DAMAGED PRODUCTS

A. Remove damaged Products from Project site.

1.06 PRODUCT OPTIONS

A. Products Specified by Reference Standards: Product meeting standard and specific requirements of these specifications.

B. Products Specified by Naming One or More Manufacturers: Products of manufacturers named and meeting specifications, no options or substitutions allowed.

C. Products Specified by Naming Three Manufacturers with an "or equal" Provision for Substitutions: Submit a request for substitution for manufacturer not named during the shop drawing submittal.

1.07 SUBSTITUTIONS

A. Engineer will consider requests for Substitutions only within 30 days after date of Owner-Contractor Agreement.

B. Substitutions may be considered when a product becomes unavailable through no fault of the Contractor.

C. Document each request with complete data substantiating compliance of proposed Substitution with Contract Documents.

D. Request constitutes a representation that Contractor:
   1. Has investigated proposed product and determined that it meets or exceeds the quality level of the specified product.
   2. Shall provide same warranty for Substitution as for specified product.
   3. Shall coordinate installation and make changes to other Work which may be required for the Work to be complete with no additional cost to Owner.
   4. Waives claims for additional costs or time extension that may subsequently become apparent.
   5. Shall reimburse Owner for review or redesign services associated with reapproval by authorities.

E. Substitutions will not be considered when they are indicated or implied on shop drawing or product data submittals, without separate written request, or when acceptance will require revision to the Contract Documents.

F. Substitution Submittal Procedure:
   1. Submit three copies of request for Substitution for consideration. Limit each request to one proposed Substitution.
   2. Submit shop drawings, product data, and certified test results attesting to proposed product equivalence.
   3. Engineer will notify Contractor, in writing, of decision to accept or reject request.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 01 70 00

EXECUTION AND CLOSEOUT REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Examination.

B. Cutting and patching.

C. General installation provisions.

D. Complaint response.

E. Cleaning and protection.

F. Final inspection and tests.

G. Adjusting.

H. Close-out procedures.

1.02 EXAMINATION

A. Verify that existing site conditions and substrate surfaces are acceptable for subsequent Work. Beginning new Work means acceptance of existing conditions.

B. Verify that existing substrate is capable of structural support or attachment of new Work being applied or attached.

C. Examine and verify specific conditions described in individual specifications sections.

D. Verify that utility services are available, of the correct characteristics, and in the correct locations.

1.03 CUTTING AND PATCHING

A. General
   1. Do not cut, or alter the work of other contractors without written approval of the Engineer.
   2. Work removed shall be replaced or repaired by the Contractor who removed or damaged the work, and a craftsman, skilled in the trade that the particular replacement requires, shall do the work. (i.e.: A mason, not an electrician, shall replace masonry removed by the Electrical Contractor.)
   3. Conduct removal operations in a manner that will eliminate hazards to persons and property and prevent the release of dust and rubbish into the air. Existing work, which is to remain and is damaged by contract operations shall be replaced with new materials at no additional cost to the Owner.
   4. For replacement of work removed, comply with specifications for type of work to be done.

B. Inspection
   1. Inspect existing conditions of work including elements subject to movement or damage during cutting and patching, and excavating and backfilling.

2. After uncovering work, inspect conditions affecting installation of new products.

C. Preparation prior to cutting
   1. Provide shoring, bracing, and support as required to maintain structural integrity of project.
   2. Provide protection for other portions of project.
   3. Provide protection from elements.

D. Performance
   1. Execute fitting and adjustment of products to provide finished installation to comply with specified tolerances, finishes.
   2. Execute cutting and demolition by methods to prevent damage to other work and provide proper surfaces to receive installation of repairs and new work.
   3. Execute excavating and backfilling as specified in Section 31 23 33, Trenching for Utilities.
   4. Restore work, which has been cut or removed; install new products to provide completed work in accordance with requirements of contract documents.
   5. Refinish entire surfaces as necessary to provide an even finish.
      a. Continuous Surfaces: To nearest intersections.
      b. Assembly: Entire Refinishing.

1.04 GENERAL INSTALLATION PROVISIONS

A. Require Installer of each major component to inspect conditions under which Work is to be performed. Clean substrate surfaces prior to applying next material or substance. Do not proceed until unsatisfactory conditions have been corrected.

B. Comply with manufacturer's recommendations to the extent that they are more explicit or stringent than requirements contained in Contract Documents.

C. Provide attachment and connection devices and methods necessary for securing Work. Secure Work true to line and level. Allow for expansion and building movement.

D. Provide uniform joint widths in exposed Work. Arrange joints in exposed Work to obtain the best visual effect. Refer questionable choices to the Engineer for final decision.

E. Check dimensions before starting each installation.

F. Install each component during weather conditions and Project status that will ensure the best possible results. Isolate each part of the completed construction from incompatible material as necessary to prevent deterioration.

G. Coordinate temporary enclosures with required inspections and tests, to minimize the necessity of uncovering completed construction for that purpose.

H. Where mounting heights are not indicated, install individual components at standard mounting heights recognized within the industry for the particular application indicated. Refer questionable mounting height decisions to the Engineer for final decision.

1.05 COMPLAINT RESPONSE

A. A Complaint Response Procedure shall be established to ensure that complaints resulting from construction operations are adequately attended to in a timely manner. As a minimum the Contractor's procedure shall be as follows:
   1. Designate a representative to receive complaints by email from the Engineer. Provide email address and cell phone number for representative.
   2. Maintain a log of the complaints with the date of receipt, type of complaint, address of the location of complaint, individual to contact for complaint, description of issue, date resolved and method of resolution.
   3. Engineer shall note the complaint as an urgent or non-urgent complaint.
   4. Urgent Complaint: Investigate and resolve the complaint within 24 hours of the notification.
   5. Non-Urgent Complaint: Investigate and resolve within seven (7) days.
   6. The time to resolve a complaint may be established as shorter or longer as may be mutually agreed to by pertinent parties.
   7. If a complaint has not been resolved by the above time or agreed to extension, the Owner may proceed to act in accordance with the applicable terms of the Contract Documents which includes:
      a. Allow additional time for Contractor to satisfactorily resolve, or
      b. Give Contractor 7 calendar days' notice that the Owner will remedy the complaint and back charge the Contractor for costs incurred, or
      c. Retain additional monies as part of partial payment retainage until the complaint is resolved.
   8. In the case of an emergency, the Contractor representative will be notified by phone that immediate action is required. If necessary the Owner may elect to secure site and back charge the Contractor.

1.06 CLEANING AND PROTECTION

A. During handling and installation, clean and protect construction in progress and adjoining materials in place. Apply protective covering where required to ensure protection from damage or deterioration.

B. Clean and maintain completed construction as frequently as necessary through the construction period. Adjust and lubricate components as required to ensure proper operation.

C. Limiting Exposures: Supervise construction activities to ensure that no part of the construction, completed or in progress, is subject to harmful, or dangerous exposure during the construction period. Where applicable, such exposures include, but are not limited to, the following:
   1. Water or ice.
   2. Heavy traffic.
   3. Misalignment.
   4. Improper shipping or handling.
   5. Theft.
   6. Vandalism.

D. Clean Project prior to final inspection. Project clean up shall include, but not be limited to, the following:
   1. Remove waste and surplus materials.
   2. Remove temporary construction facilities.

1.07 FINAL INSPECTION AND TESTS

A. Prior to final acceptance place equipment in operation and make necessary adjustments for proper operation. Test equipment under normal operating conditions in the presence of Engineer. Test shall show conclusively that requirements of the specifications have been fulfilled.

B. Complete punch list items within 30 days of receipt from Engineer. Owner may have work not completed within 30 days performed by others with the cost deducted from Contractor’s final payment. Additional engineering and inspection services required as a result of Contractor not completing punch list within 30 days shall be at Contractor's expense.

1.08 CLOSE-OUT PROCEDURES

A. Submit written certification that Contract Documents have been reviewed, Work has been inspected, and is complete in accordance with Contract Documents and ready for Engineer's inspection.

B. Provide submittals to Engineer that are required by governing or other authorities.

C. Submit set of Record Documents indicating changes during construction as required in Section 01 33 00, Submittal Procedures.

D. Submit final Application for Payment identifying total adjusted Contract Sum, previous payments, and final amount due.

E. Submit the following with final Application for Payment:
   1. Affidavit of Release of Liens
   2. Consent of Surety for Final Payment
   3. Affidavit of Payment of Debts and Claims

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 09 91 00

PAINTING

PART 1 GENERAL

1.01 SCOPE

A. Work under this section shall include the painting of all surfaces specified herein and indicated on the Drawings.

1.02 DESCRIPTION

A. Provide the painting required to paint the newly constructed areas under this contract.

B. Where new pumps are to be installed, paint the entire piping and pumping system at continuous connection. Where new work is installed within existing, paintings should continue as follows:
   1. Continuous Surface: To the nearest intersection.
   2. Assembly: Entire Assembly

1.03 REFERENCE STANDARDS

A. The latest revision, at the time of bidding, of the publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.
   1. National Sanitation Foundation (NSF)
      a. Drinking Water System Components - Health Effects.
   2. International Concrete Repair Institute (ICRI)
      a. Technical Guideline No. 310.2-1997, Selecting and Specifying Concrete Surface Preparation for Coatings, Sealers, and Polymer Overlays.

1.04 QUALITY ASSURANCE

A. Paint supplier shall verify the compatibility of the specified paint systems to the surface to be painted both new and existing. Submit certification that the paint systems to be used are suitable for the surface to be painted. Notify Engineer of suggested changes in the paint system with the paint submittal.

B. Ensure compatibility of shop applied primers with the paints specified herein. If shop applied primers are incompatible contractor shall remove incompatible primer with SSPC SP-6 commercial blast.

C. Painting of surface indicates acceptance of surface for paint system being used.

D. Paints and varnishes shall be the standard products of the Valspar Corporation, Tnemec Company, Sherwin Williams Company, Glidden, PPG Company, Carboline, Raven or equal.

1.05 SUBMITTALS

A. Submit the following in accordance with Section 01 33 00, Submittals:
   1. Affidavit of Compliance: Affidavit shall attest that supplied products conform to the referenced standard and this specification and that all tests set forth in each applicable referenced publication have been performed and that all test requirements have been met. Submit for each of the following materials:

a. Each type of paint.

2. Certification: Provide a letter at the end of the Project certifying the following actual work dates, that the cure time for each coat complied with the manufacturer's requirements, and the manner of application pertaining to the surface preparation, number and type of coats and mil thickness is as specified.
   a. Start and completion dates for each paint coat for each major work area.
3. Catalog Data: Submit manufacturer's standard drawings or catalog cuts for the following. The equipment to be furnished for the Project shall be clearly indicated, including all options to be provided.
   a. Paint Schedule: Submit five (5) copies of the manufacturer's data sheet for each type of paint proposed to be used on the Project. Use paint schedule as indicated in these specifications as a format guide. The data sheet shall include, but not be limited to, the following:
      1) Paint system.
      2) Requirements for the following:
      3) Handling and storage.
      4) Health and safety.
      5) Surface preparation.
      6) Application.
      7) Curing time between coats and for immersion as appropriate.
      8) Certification by NSF, International in accordance with NSF Std. 61 for interior paint systems.
      9) Recommended Dry Film Thickness (DFT).

1.06 DELIVERY, STORAGE, AND HANDLING

A. The Product shall be handled in accordance with Section 01 60 00, Material and Equipment.

B. Mixing of paints shall be restricted to locations directed.

C. Take necessary precautions to prevent fire.

PART 2 PRODUCTS

2.01 PAINTING MATERIALS

A. Cleaners, thinners, driers, and other additives and surface treatment materials shall be those approved for use by the manufacturer of the paints.

B. Products used in areas to be in contact with potable water shall be certified in accordance with NSF Std. 61.

2.02 PAINTING SCHEDULE

A. For convenience only, the paints specified herein, unless listed otherwise, are as manufactured by Tnemec, Carboline, Sherwin-Williams, Raven or equal. Similar paints as manufactured by other manufacturers will be acceptable.

B. Paint on this project shall be of one manufacturer.

C. Exterior Metal Work not Specified Otherwise:

1. Galvanized, zinc coated, aluminum and bronze surfaces shall not be painted. On surfaces which have been shop coated, the priming coat may be omitted. Surfaces upon which shop coat has been damaged shall have metal cleaned to satisfaction of the Engineer and the cleaned surfaces primed with the specified primer. Surfaces so primed shall then be painted as specified.
2. Non-Submerged:
    a. Surface Preparation: SSPC SP-6 Commercial Blast.
    b. 1 coat Tnemec 66-1211 Epoxoline primer, Valspar 13-R-62 Epoxy Primer, or equal (3 mils dry) or Carboline Carboguard 890, Sherwin-Williams Macropoxy 646 Fast Cure Epoxy (1 coat @ 3.0-5.0 mils DFT).
    c. 1 coat Tnemec 66 Series Hi-Build Epoxoline, Valspar 89 Series H.B. Epoxy, or equal (2 mils dry) or Carboline's Carboguard 890, Sherwin-Williams Macropoxy 646 Fast Cure Epoxy (1 coat @ 3.0-5.0 mils DFT).
    d. Provide 1 coat Tnemec urethane Series 73, or equal (2 mils dry), Carboline Carbothane 133HB, or Sherwin-Williams Acrolon 218 HS (1 coat @ 3.0-5.0 mils DFT).
    e. For bituminous coated piping, apply 1 coat of Tnemec Series 66-1211 or Sherwin-Williams Macropoxy 646 Fast Cure Epoxy (2.5 mils dry) followed by 1 coat Tnemic 66 Series Hi-Build Epoxoline or Sherwin-Williams Macropoxy 646 Fast Cure Epoxy (same color as top coat) and 1 coat of Tnemec Series 73 Endura-Shield or Sherwin-Williams Acrolon 218 HS (urethane finish) (2 mils dry per coat), or Caroline Carboguard 890 and 1 coat Carbothane 113HB, or equal paint system.
3. Submerged or Intermittently Submerged: (NOTE: Omit primer if field blasted.)
    a. Surface Preparation: SSPC SP-10 near white.
    b. 1 coat Tnemec 66-1211 Epoxoline primer, Valspar 78-W-3 H.B. Epoxy, Sherwin-Williams Macropoxy 646 Fast Cure Epoxy, or equal (2 mils dry) or Carboline Carboguard 691 (1 coat @ 5.0-6.0 mils DFT).
    c. 2 coats Tnemec 66 Series Hi-Build Epoxoline, Valspar 78 Series H.B. Epoxy, Sherwin-Williams Macropoxy 646 Fast Cure Epoxy, or equal (3 mils dry per coat) or Carboline Carboguard 691 (1 coat @ 12.0-15.0 mils DFT).

D. Submerged or Intermittently Submerged Concrete: (Interior of Wet Well)
1. Surface Preparation: SSPC SP-13/ NACE No. 6 to a minimum ICRI CSP 5 Surface Profile.
    a. Fill large cracks, voids or other surface imperfections with a filler or resurfacer.
2. 2 coats Valspar 78 Series, 1 coat Sherwin-Williams Dura-Plate 6000 Reinforced Epoxy (100-125 mils DFT), or 1 coat Carboline Carboguard 890 (12-15 mils DFT), or 1 coat Tnemec Series 434 Permashield H2S (125 mils DFT), or 1 coat Raven 405 (125 mils DFT), or equal.

E. Exposed piping, ductwork, electrical conduits and other utility items shall be painted to match the adjacent surface colors. Each item shall be treated and primed in accordance with paint manufacturer's recommendations.

F. Finished copper work shall be cleaned immediately after erection and coated with one coal of boiled linseed oil meeting the requirements of ASTM 0260-61.

PART 3 EXECUTION

3.01 GENERAL REQUIREMENTS

A. Surfaces to be painted shall be thoroughly clean and shall be dry when paint is applied. Painting materials shall be thoroughly worked into all joints, crevices, and open spaces.

B. Colors and shades of colors shall be as directed unless specified otherwise.

C. Finished surfaces shall be smooth, even and free of defects prior to painting.

D. Surfaces which are inaccessible for painting after erection shall be treated, primed and painted prior to erection.

E. Equipment nameplates, tags, signs, and equipment lubrication points shall be masked or otherwise protected from covering with paint.

F. Properly mask and protect portion of finished work not to be painted.

G. Damaged painting shall be retouched before applying the succeeding coat.

H. Existing bare surfaces and surfaces made bare by cleaning methods shall be primed prior to painting.

I. The number of paint coats specified shall be in addition to spot priming and shop prime coats except as indicated otherwise.

J. Copper and aluminum, except for pipe identification, shall not be painted.

K. Paints shall be applied strictly in accordance with the manufacturer's direction and thinners shall be of the type required by the individual paint specifications. No thinners will be stored on site or used unless specifically authorized by the Engineer.

L. Painting of exterior surfaces shall extend one vertical foot below finished grade.

3.02 SURFACE PREPARATION

A. General: Dirt, rust, loose scale and particles, disintegrated paint, grease, and foreign matter shall be removed by scraping, sand blasting, wire brushing, or other approved methods, from all surfaces which are to receive paint or other finish. Surfaces shall be free from dust and in proper condition to receive paint or other finish, Where necessary, putty shall be applied with a knife. Sand-papering, where necessary, shall be done after the undercoats are dry.

B. Concrete and Masonry: Dirt, fungus, grease, and oil shall be removed prior to application of paint by washing the surface with a solution composed of from 2 to 8 ounces of trisodium phosphate per gallon of hot water and then rinsing thoroughly with fresh water. Efflorescence shall be removed from concrete and masonry surfaces by scraping, wire brushing and washing with a 5 to 10 percent by weight, solution of muriatic acid and then washing thoroughly with fresh water, removing all traces of the acid. The trisodium phosphate and muriatic acid solutions shall be strengths to perform their functions properly. Glaze and all loose particles and scale shall be removed by wire brushing. All concrete and masonry surfaces to be painted shall be given a neutralizing treatment consisting of 2 pounds of sinz sulphate in one gallon of warm water. The neutralizer shall be applied liberally and allowed to dry, following which the surfaces shall be rinsed thoroughly with clean water and allowed to dry for not less than 48 hours before paint is applied.

C. Piping, Fittings and Mechanical and Electrical Equipment:
   1. Piping to be insulated, except zinc-coated pipe, prior to the application of the insulation, shall be coated with one coat of approved pretreatment coating to a dry film thickness of 0.3 to 0.5 mil, and then given two coats of zinc-chromate primer, each coat applied to a minimum dry film thickness of one mil. Zinc-coated piping under insulation shall not be painted.
   2. Pipe hangers, structural supports, pipe and fittings, conduit and conduit fittings, pipe covering, insulation and miscellaneous steel and iron work shall be painted to match the adjacent interior surfaces and exterior work shall be as directed, utilizing the painting schedule as hereinbefore specified.
   3. Factory finished surfaces shall be painted as indicated.

3.03 APPLICATION

A. Workmanship shall be first-class in every respect. Paint shall be applied to dry, except as otherwise specified, on thoroughly clean surfaces only and shall be worked into all joints, crevices, and open spaces thoroughly. Paint shall be applied carefully with good clean brushes. Sufficient time shall be allowed between coats to permit thorough drying, and each coat shall be in proper condition to receive the next coat before its application. Finish coats shall be smooth and free from runs, sags, blisters, or other defects. Each coat of paint shall be sufficiently heavy to cover completely the previous coat or surface. Exterior paint shall not be applied during foggy or inclement weather.

3.04 COATING THICKNESS

A. General: Thickness of coatings shall be checked by a dry film thickness gauge of the magnetic type operated electrically or by permanent magnet. Gauges shall be calibrated with a standard which is approximately the same thickness as the coating to be measured and, if possible, on metal identical both in composition and surface texture to that underlying coating. The Contractor shall be responsible for providing a gauge for checking the film thickness.

B. The total dry mil thickness of the coating for exposed metal surfaces subject to submergence in wastewater shall be not less than 10 mils.

3.05 CLEAN-UP

A. On completion of the painting work, clean all paint spots and other paint material from surfaces not intended for painting. Clean all rubbish and accumulated material from the work site. Leave the work in a clean and orderly condition, acceptable to the Engineer. No payment for painting work will be approved until the contractor has requested anticipated and firm thickness has been verified.

END OF SECTION

SECTION 26 00 02

ELECTRICAL

PART 1 GENERAL

1.01 SCOPE

A. Electrical work includes the furnishing of labor, materials, accessories, and equipment required to install a complete and fully operational electrical system as indicated on the Drawings and specified for a complete project.

1.02 DEFINITIONS

A. Where the following terms are used in this Division of the specifications and on the Electrical Drawings, meanings are as indicated.
   1. Provide: Furnish and install.
   2. Furnish: Acquire and make available devices or equipment for installation by others.
   3. Install: Install devices or equipment furnished by others.
   4. Wherever the words “Approved” and “Approved Equal” appear, it is intended that items other than the model numbers specified shall be subject to the approval of the Engineer.
   5. Panelboard, switchboard, and motor control center space designations:
      a. Blank: Not intended for use; plate only.
      b. Space: Contains necessary bus and hardware for future addition of circuit breakers or starters within size range.
      c. Spare: Contains a complete circuit breaker or starter installed, size as indicated for future use.
   6. Electrical Contractor: Electrical subcontractor. Contract II Contractor or Sub-contractor to General Contractor.

1.03 COORDINATION OF WORK

A. Electrical work is included in the General Contract. It is the responsibility of the General Contractor to provide the coordination of electrical work with the electrical sub-contractor.

1.04 FEES, PERMITS, AND INSPECTIONS

A. Electrical Contractor shall obtain permits and arrange for the inspections necessary for the installation of the electrical work and furnish the Engineer with certificates of inspection from authorities having jurisdiction.

B. Inspections and tests shall be made upon formal notice to the Engineer from the Contractor sufficiently in advance to allow a representative of the Engineer to be present for each test.

C. No construction shall be covered up or concealed until it has been inspected or approved. Furnish material, labor, fuel, equipment and apparatus for tests as specified for the work.

D. Make final inspection and tests in the presence of the Engineer and Owner. Make tests under conditions simulating as nearly as practicable, those which will be

obtained in operation and which show conclusively that the requirements of the specifications have been fulfilled. Provide instruments required for the tests.

1.05 CODES AND STANDARDS

A. The applicable provisions of the following codes and standards, each of the latest issues, and addenda thereto, shall form a part of these specifications.

B. North Carolina Building Code.

C. National Electrical Code (NFPA 70).

D. Underwriters' Laboratories, ASTM, ASME, NEMA, ANSI, NFPA and other standards as specifically referred to in these specifications or as shall apply to the work being done.

1.06 MANUFACTURER'S DIRECTIONS

A. Follow manufacturer’s directions for the delivery, storage, protection, and installation of equipment and materials. Notify Engineer in writing of conflicts between the requirements of the contract documents and manufacturer's directions. Obtain the Engineer's written instructions before proceeding with the work. Correct deficiencies in work that does not comply with the manufacturer's directions or written instructions from the Engineer.

1.07 SUBMITTALS

A. Shop Drawings: Submit shop drawings for the equipment mounting rack to include the following:
   1. Indicate assembly dimensions, locations of support posts, and general construction details.
   2. Indicate welded connections.
   3. Provide a Bill of Materials to include all components of the assembly.
   4. Indicate location and type of insulating materials.

B. Product Data: Submit product data for wire, conduit, wiring devices, circuit breakers, and lighting fixtures.

PART 2 PRODUCTS

2.01 EQUIPMENT AND MATERIAL

A. Equipment and material of the same general type shall be of the same make throughout the work to provide uniform appearance, operation and maintenance.

B. Equipment and material shall be new and shall bear the manufacturer's name or trade name.

C. All materials and equipment shall be labeled or listed by Underwriters’ Laboratories or other North Carolina approved testing agency.

2.02 DIMENSIONS

A. Ensure that items of equipment furnished fit the space available. Make necessary field measurements to ascertain space requirements, including connections. Provide such sizes and shapes of equipment that the final installation shall suit the true intent and meaning of the drawings and specifications.

2.03 EQUIPMENT ACCESSORIES

A. Provide equipment, accessories, connections, and incidental items necessary to fully complete the work, ready for use, occupancy and operation by the Owner.

2.04 SUPPORTING DEVICES

A. Provide materials, sizes, and types of anchors, fasteners and supports to carry the loads of equipment and conduit. Consider weight of wire in conduit when selecting products.

B. Anchors and Fasteners:
   1. Concrete Structural Elements: Use expansion anchors, powder actuated anchors, or preset inserts.
   2. Steel Structural Elements: Use stainless steel bolts, nuts, and washers. Galvanized beam clamps may be used to support conduit from steel beams.
   3. Concrete Surfaces: Use self-drilling anchors or expansion anchors.
   4. Hollow Masonry and Gypsum Board Partitions: Use toggle bolts or hollow wall fasteners.
   5. Solid Masonry Walls: Use expansion anchors.
   6. Wood: Use wood screws.

C. All exterior electrical equipment shall be protected from the weather by means of a weather shield fabricated of 3/16” aluminum sheet. The weather shield shall be of adequate size to accommodate all equipment shown. A suitable barrier of neoprene or similar material shall be placed between dissimilar metals to prevent galvanic corrosion.

2.05 ELECTRICAL IDENTIFICATION

A. Nameplates: Engraved laminated phenolic. Edges shall be chamfered. Minimum size shall be 1 inch high by 2.5 inches wide. Letter size shall be ¼ inch high. Color shall be blue surface with white core.

B. Underground Utilities Marker Tape: Tape shall be minimum 3-inch wide polyethylene plastic manufactured specifically for identification of buried utilities with means of enabling detection by a metal detector to a minimum depth of 3 feet. Tape shall be color coded and continuously imprinted with warning and identification markings in bold black letters to read "CAUTION - BURIED ELECTRICAL LINE BELOW." Color shall be red and printing shall be permanent, unaffected by moisture or soil. Tape shall be by Blackburn Manufacturing , Joseph G. Pollard Co., or Reef Industries Inc.

2.06 BUILDING WIRE

A. Description: Single conductor insulated wire.

B. Conductor: Copper.

C. Insulation Voltage Rating: 600 volts.

D. Insulation: ANSI/NFPA 70, Type THHN/THWN.

2.07 CONDUIT

A. Underground Installations: Use Schedule 40 PVC conduit.

B. Transition From Underground to Above Grade: Where underground raceways are required to turn up into cabinets, distribution equipment, etc., the elbow required and stub-up out of the earth or shall be galvanized RMC (rigid metal conduit). Provide a bituminous coating on metal conduit in direct contact with the earth or concrete.

C. Exterior Locations: Use RMC, IMC (intermediate metal conduit), or PVC coated metal conduit.

D. Interior Locations: Use RMC, IMC, or EMT (electrical metallic tubing).

E. Conduit Containing Only Grounding Conductors: Schedule 80 PVC.

F. Rigid Metal Conduit: ANSI C80.1, galvanized.

G. Intermediate Metal Conduit: Rigid metal, galvanized.

H. RMC and IMC Fittings and Conduit Bodies: ANSI/NEMA FB 1; material to match conduit. Connectors; insulated throat type.

I. PVC Coated Metal Conduit: NEMA RN 1; rigid metal conduit with external PVC coating, 20 mils thick.

J. PVC Coated Metal Conduit Fittings and Conduit Bodies: ANSI/NEMA FB 1; steel fittings with external PVC coating to match conduit. Connectors; insulated throat type.

K. Liquidtight Flexible Metal Conduit: Interlocked steel construction with PVC jacket.

L. Liquidtight Conduit Fittings: ANSI/NEMA FB 1. Connectors; insulated throat type.

M. EMT: ANSI C80.3; galvanized tubing.

N. EMT Fittings and Conduit Bodies: ANSI/NEMA FB 1; steel compression type. Connectors; insulated throat type.

O. PVC: NEMA TC 2; Schedule 40.

P. PVC Fittings and Conduit Bodies: NEMA TC 3.

2.08 PANELBOARD CIRCUIT BREAKERS

A. NEMA AB 1, bolt on type thermal magnetic trip circuit breakers, with common trip handle for all poles, compatible with existing panelboard. Do not use tandem circuit breakers.

2.09 WIRING DEVICES

A. Light Switches:
   1. Description: NEMA WD 1, heavy-duty specification grade AC only toggle switch with ground screw.
   2. Device Body: Brown plastic with abuse resistant toggle handle.
   3. Voltage Rating: 120-277 volts AC.
   4. Current Rating: 20 amperes.

B. Receptacles:
   1. Description: NEMA WD 1; heavy-duty specification grade receptacle, arranged for back or side wiring.
   2. Device Body: Brown plastic with impact resistant face.
   3. Configuration: NEMA WD 6; type as specified and indicated.
   4. Convenience Receptacle: 125 volts, 20 amperes, Type 5-20R.

5. GFCI Receptacle: Convenience receptacle with integral ground fault circuit interrupter to meet regulatory requirements.

C. Cover Plates:
1. Weatherproof Switch Cover Plate: Gasketed PVC with hinged gasketed toggle cover.
2. Weatherproof Receptacle Cover Plate: Gasketed deep PVC or clear plastic cover that is listed as “raintight while in use”. Minimum distance between cover and face of device 3.5 inches.

PART 3 EXECUTION

3.01 SUPERVISION

A. Provide a competent foreman to be in charge of the construction. Foreman shall have extensive experience in the work to be performed.

3.02 MATERIALS AND WORKMANSHIP

A. Materials and workmanship shall comply with applicable codes, specifications, state and local ordinances, industry standards, and utility company regulations. Damage or defects developing before acceptance of the work shall be repaired or replaced.

3.03 LOCATION OF CONDUIT, FIXTURES, EQUIPMENT, AND APPURTENANCES

A. Locations shall be adjusted to accommodate the work to interferences anticipated and encountered.

3.04 STRUCTURE AND FINISHES

A. Protect structure and finishes. Repair damage incurred.

3.05 SUPPORTS

A. Support plumb, rigid, and true to line work and equipment installed under this contract. Thoroughly study general and electrical Drawings; shop drawings; and catalog data to determine how equipment, accessories, fixtures, and related items are to be supported, mounted, or suspended. Provide bolts, inserts, brackets, structural supports, and accessories for proper support whether or not shown on the drawings.

3.06 GROUNDING

A. Provide bonding to meet Regulatory Requirements.

B. Bond together the service neutral, equipment grounding system, service equipment enclosure, and service conduits (if metal) in the service equipment enclosure. Bond the service equipment to the rod electrode(s) with the grounding electrode conductor.

C. Install additional rod electrodes as required to achieve a maximum grounding system resistance of 25 ohms.

D. Equipment Grounding Conductor: Provide separate, green insulated conductor within each feeder and branch circuit raceway. Terminate each end on suitable lug, bus, or bushing.

E. Conduit Systems:
1. Ground all metallic conduit systems.

F. Boxes, Cabinets, Enclosures, and Panelboards:
   1. Bond the equipment grounding conductors to each pull box, junction box, outlet box, cabinet, and other enclosure through which the conductors pass.
   2. Provide lugs in each box and enclosure for equipment grounding conductor termination.
   3. Boxes and enclosures with concentric, eccentric, or oversized knockouts shall be provided with bonding bushings and jumpers. The jumpers shall be sized per the NEC and lugged to the box.

G. Motor Control Panels:
   1. Make equipment grounding conductor connections to ground bus in motor control panel enclosures.

3.07 SUPPORTING DEVICES

A. Do not fasten supports to pipes, ducts, mechanical equipment, and conduit.

B. Obtain permission from Engineer before using power-actuated anchors.

C. Do not drill or cut structural members.

D. Install surface-mounted cabinets with minimum of four anchors.

E. In wet and damp locations use steel channel supports to space cabinets and panelboards one inch off wall.

3.08 ELECTRICAL IDENTIFICATION

A. Color coding is required for branch and control circuit conductors. Color shall be green for grounding conductors. Color of the ungrounded and neutral conductors shall be as follows:
   1. 240/120 volt, 3 phase, 4 wire system
      a. Phase A Black
      b. Phase B Orange (Hi Leg)
      c. Phase C Red
      d. Neutral White
   2. Conductors #8 (AWG) and smaller shall be factory color coded.
   3. Conductors #6 (AWG) and larger may be identified with plastic tape of the proper color.

B. Nameplates: Nameplates shall be used to identify equipment (or equipment served) and location of supply side overcurrent protective device. Nameplates shall be provided on each item of distribution and control equipment. Install parallel to equipment lines. Secure nameplate to equipment with self-tapping stainless steel screws. Embossed, self-adhesive plastic tape is not acceptable for marking equipment.

C. Identify underground conduits using underground warning tape. Install one tape per trench at 12 inches above duct bank or direct buried conduit.

3.09 WIRE INSTALLATION

A. Wiring method shall consist of building wire in conduit.

B. Route wire and cable as required to suit project conditions.

C. Use solid conductor for feeders and branch circuits 10 AWG and smaller, except use stranded conductors for control circuits.

D. Use stranded conductor for feeders and branch circuits 8 AWG and larger.

E. Pull all conductors into raceway at same time.

F. Neatly train and lace wiring inside boxes, equipment, and panelboards.

G. Clean conductor surfaces before installing lugs and connectors.

H. Use insulated spring wire connectors with plastic caps for copper conductor splices and taps 10 AWG and smaller.

3.10 CONDUIT INSTALLATION

A. Cut conduit square using saw or pipe cutter; de-burr cut ends.

B. Bring conduit to shoulder of fittings; fasten securely.

C. Join nonmetallic conduit using cement as recommended by manufacturer. Wipe nonmetallic conduit dry and clean before joining. Apply full even coat of cement to entire area inserted in fitting. Allow joint to cure for 20 minutes, minimum.

D. Use conduit hubs or sealing locknuts to fasten conduit to sheet metal boxes in damp and wet locations.

E. Install no more than equivalent of four 90-degree bends between boxes. Use conduit bodies to make sharp changes in direction, as around beams. Use factory elbows for bends in metal conduit larger than 2-inch size.

F. Wall, Ceiling, and Floor Penetrations:
   1. Provide neatly cut openings slightly larger than the conduit. Openings shall be drilled where possible.
   2. Seal annular space around conduit with an approved material.
   3. Exterior wall penetrations shall be sealed with a weatherproof sealant.

G. Protect exposed threads of PVC coated metal conduit at connections to fittings by applying a protective coating equivalent to the factory-applied coating. Also touch up areas where the factory applied coating has been damaged during storage and installation.

H. Route exposed conduit parallel and perpendicular to walls or structure lines.

I. Route underground conduit from point-to-point.

J. Arrange supports to prevent misalignment during wiring installation.

K. Support conduit using approved corrosion resistant straps or other conduit support devices.

L. Conduit Support Locations:
   1. RMC and IMC: Conduit shall be fastened in place on not more than 10 feet on center, within 1 foot of changes in direction, and within 3 feet of connection to outlet boxes, junction boxes, cabinets, or fittings.
   2. EMT: Tubing shall be fastened in place on not more than 10 feet on center, within 1 foot of changes in direction, and within 3 feet of connection to outlet boxes, junction boxes, cabinets, or fittings.

3. Nonmetallic Conduit: Fasten on intervals not to exceed 3 feet (1/2”-1”), 5 feet (1 ¼”-2”), or 6 feet (2 ½”-3”). Fasten within 3 feet of connection to outlet boxes, junction boxes, cabinets, or fittings.
4. Flexible Conduit: Fasten not more than 4 1/2 feet on center and within 12 inches of connections to outlet boxes, junction boxes, cabinets, or fittings.

M. Underground Conduit Installation:
1. Use schedule 40 PVC suitable for direct burial.
2. Install to locate top of conduit 24 inches below grade or deeper as required.
3. Provide trenching and backfill in accordance with Division 2.
4. Provide warning tape. Install 12-inches above top of conduit.

3.11 DUCT BANK INSTALLATION

A. Underground conduit shall be encased in a minimum of three inches of concrete on all sides.

B. Install duct bank minimum 24 inches below finished grade.

C. Join nonmetallic conduit using adhesive as recommended by manufacturer.

D. Wipe nonmetallic conduit dry and clean before joining. Apply full even coat of adhesive to entire area inserted in fitting. Allow joint to cure for 20 minutes, minimum.

E. Install no more than equivalent of four 90-degree bends between pull points.

F. Provide spacers to maintain spacing between conduits during concrete pour or backfill operations as applicable. Minimum spacing shall be maintained between conduits as indicated on the Drawings.

G. Securely anchor conduit to prevent movement during concrete placement.

H. Swab conduit. Use suitable caps to protect installed conduit against entrance of dirt and moisture.

I. Backfill with select excavation material. Backfill shall be free of stones and debris larger than 6 inches in dimension.

J. Interface installation of underground warning tape with backfilling. Install tape 12 inches above top of duct bank.

3.12 BOX INSTALLATION

A. Install electrical boxes as shown on Drawings, and as required for wiring devices, splices, taps, wire pulling, equipment connections, and compliance with regulatory requirements.

B. Use cast box for exposed outlet, pull, and junction boxes nominal 4” x 4” and smaller. For larger pull and junction boxes use:
1. Interior Dry Locations: Galvanized steel with screw cover.
2. Other Locations: NEMA 3R with screw cover.

3.13 WORK IN EXISTING PANELBOARDS

A. Revise panelboard circuit directory to reflect addition of new circuits.

3.14 WIRING DEVICE INSTALLATION AND QUALITY CONTROL

A. Install products in accordance with manufacturer's instructions.

B. Install devices plumb and level.

C. Inspect each wiring device for defects.

D. Connect wiring device grounding terminal to outlet box with bonding jumper and to branch circuit equipment grounding conductor.

E. Install switches with OFF position down.

F. Operate each wall switch with circuit energized and verify proper operation.

G. Verify that each receptacle device is energized.

H. Test each receptacle device for proper polarity.

I. Test each GFCI receptacle device for proper operation.

3.15 PAINTING

A. Any electrical equipment which has its factory paint coat scratched or otherwise damaged shall be refinished with the same quality of paint and workmanship as used by the manufacturer.

3.16 CLEAN-UP

A. Clean electrical equipment with cleaning material appropriate to the surface and material being cleaned.

B. Clean bottoms of equipment enclosures to remove metal filings and other debris.

C. Remove from the site all debris, crating, waste material, tools, temporary facilities, construction equipment, machinery, and surplus materials.

END OF SECTION

SECTION 26 05 33.19

BOXES

BOXES

1.01 SECTION INCLUDES

A. Outlet boxes.

B. Pull and junction boxes.

1.02 RELATED SECTIONS

A. The following Sections have work that is directly related to this Section. This does not relieve the Contractor of his responsibility of proper coordination of all the work:
   1. Electrical Identification
   2. Wiring Devices

1.03 REFERENCES

A. ANSI/NEMA FB 1 – Fittings and Supports for Conduit and Cable Assemblies

B. ANSI/NFPA 70 – National Electrical Code

C. NEMA 250 – Enclosures for Electrical Equipment (1000 Volts Maximum)

D. UL 514A – Metallic Outlet Boxes

E. UL 514C – Standard for Non-metallic Outlet Boxes, Flush Device Boxes, and Covers

F. UL 50 – Enclosures for Electrical Equipment, Non-environmental Considerations

G. UL 50E – Enclosures for Electrical Equipment, Environmental Considerations

1.04 REGULATORY REQUIREMENTS

A. Conform to requirements of ANSI/NFPA 70.

B. Furnish products listed and classified by Underwriters Laboratories, Inc. or other North Carolina recognized third party testing agency.

1.05 SUBMITTALS

A. Product data: Provide for each type of box used.

1.06 IDENTIFICATION

A. Each pull and junction box shall be identified with the box name as indicated on the Contract Drawings (e.g., CPB-ROFP-1) or as directed by the Engineer. A nameplate shall be securely affixed in a conspicuous place on each box. Nameplates shall be as specified in Section 16195, Electrical – Identification.

PART 2 PRODUCTS

2.01 PULL AND JUNCTION BOXES

A. General

1. All pull and junction boxes shall be UL listed and labeled.
2. Pull and junction boxes shall not be provided with eccentric or concentric knockouts.
3. Pull and junction boxes mounted embedded in concrete shall be UL listed for embedment.
4. Where metallic boxes are used they shall be of all welded construction.

B. Pull Boxes
1. All Pull boxes shall be provided with a matching gasketed cover. For covers with dimensions of 24 inches by 24 inches or less, the cover shall be held in place by machine screws. For covers with dimensions greater than 24 inches by 24 inches, the cover shall be hinged and held in place by screw-operated clamp mechanisms. Hinge pins shall be removable. Clamp mechanism material of construction shall match that of the associated box.
2. Pull boxes shall not have any wire terminations inside, other than those for grounding/bonding. A ground bar shall be provided with the necessary number of screw type terminals. Twenty percent of the total amount of terminals otherwise required for the pull box (minimum of two) shall be provided as spare terminations. Boxes requiring any other wire terminations shall be furnished and installed in accordance with the requirements for junction boxes herein.
3. Pull boxes shall be 6 inches wide by 6 inches tall by 4 inches deep, minimum. For applications requiring larger boxes, the box shall be sized in accordance with the fill requirements and dimensional requirements of the NEC.
4. Barriers shall be provided in pull boxes to isolate conductors of different voltages, types, and functions. Barrier material of construction shall match that of the box. Isolations shall be provided between the following groups:
    a. Power wiring
    b. AC control wiring
    c. DC control wiring
    d. Instrumentation wiring

C. Junction Boxes
1. Junction boxes used for lighting and receptacle circuits only shall be provided with matching gasketed cover held in place by machine screws.
2. Junction boxes for all uses other than lighting and receptacle circuits shall be provided with a hinged, gasketed cover. Hinge pins shall be removable. Cover shall be held in place by screw-operated clamp mechanisms. Clamp mechanism material of construction shall match that of the associated box.
3. Barriers shall be provided in pull boxes to isolate conductors of different voltages, types, and functions. Barrier material of construction shall match that of the box. Isolations shall be provided between the following groups:
    a. Power wiring
    b. AC control wiring
    c. DC control wiring
    d. Instrumentation wiring
4. Junction boxes used for lighting and receptacle circuits only shall be allowed to have screw-on (wire nut) type connectors for wire terminations/junctions.
5. Junction boxes for all uses other than lighting and receptacle circuits shall be provided with terminal strips, consisting of the necessary number of screw type terminals. Current carrying parts of the terminal blocks shall be of ample capacity to carry the full load current of the circuits connected, with a 10A minimum

capacity. Terminal strips shall be rated for the voltage of the circuits connected. A separate ground bar shall be provided with the necessary number of screw type terminals. Twenty percent of the total amount of the terminals otherwise required for the junction box (minimum of two) shall be provided as spare terminations. When barriers are provided within the box, separate terminal strips shall be provided in each barrier area.

6. Junction boxes shall be 6 inches wide by 6 inches tall by 4 inches deep, minimum. For applications requiring larger boxes, the box shall be sized in accordance with the fill requirements and dimensional requirements of the NEC. Terminal blocks (including spare terminals) shall be considered when sizing the junction box.

D. Enclosure Types and Materials
   1. In non-hazardous locations, pull and junction boxes shall be furnished with the following enclosure type and material of construction, dependent upon the designation of the area in which they are to be installed.
      a. Indoor Wet Process Area – NEMA 4X, Type 304 Stainless Steel
      b. Indoor Dry Process Area – NEMA 12, Painted Steel
      c. Indoor Dry Non-process Area – NEMA 1, Painted Steel
      d. Indoor Chemical Storage/Transfer Area – NEMA 4X, Type 304 Stainless Steel
      e. All Outdoor Areas – NEMA 4X, Type 304 Stainless Steel
   2. In hazardous locations, pull and junction boxes shall be furnished with the following enclosure type and material of construction, dependent upon the classification of the area in which they are to be installed. Area classifications are indicated on the Drawings.
      a. Class 1, Division 1, Group D – NEMA 7, Die Cast Aluminum
      b. Class 1, Division 2, Group D – NEMA 4X, Type 304 Stainless Steel
      c. Class 2, Division 1, Group F – NEMA 9, Die Cast Aluminum
      d. Class 2, Division 2, Group F – NEMA 4X, Type 304 Stainless Steel
   3. Non-metallic enclosures, NEMA 7 enclosures, and NEMA 9 enclosures shall be provided with threaded integral conduit hubs.

2.02 OUTLET BOXES

A. General
   1. Outlet boxes shall be provided with a trim appropriate for the wiring device installed inside. Reference Section 16140, Wiring Devices, for outlet box trim requirements. An appropriate outlet box trim is required to achieve the NEMA rating of the outlet boxes as specified herein.

B. Surface Mount Outlet Boxes
   1. Outlet boxes shall be the deep type, no less than 2.5 inches deep.
   2. Outlet boxes shall be provided in single or multi-gang configuration as required, sized in accordance with the requirements of the NEC.
   3. In non-hazardous locations, outlet boxes shall be furnished with the following enclosure type and material of construction, dependent upon the designation of the area in which they are to be installed.
      a. Indoor Wet Process Area – NEMA 4X, Cast Aluminum
      b. Indoor Dry Process Area – NEMA 1, Cast Aluminum
      c. Indoor Dry Non-process Area – NEMA 1, Cast Aluminum
      d. Indoor Chemical Storage/Transfer Area – NEMA 4X, Cast Aluminum
      e. All Outdoor Areas – NEMA 4X, Cast Aluminum

4. In hazardous locations, outlet boxes shall be furnished with the following enclosure type and material of construction, dependent upon the classification of the area in which they are to be installed. Area classifications are indicated on the Drawings.
    a. Class 1, Division 1, Group D – NEMA 7, Die Cast Aluminum
    b. Class 1, Division 2, Group D – NEMA 4X, Cast Aluminum
    c. Class 2, Division 1, Group F – NEMA 9, Die Cast Aluminum
    d. Class 2, Division 2, Group F – NEMA 4X, Cast Aluminum
5. Outlet boxes shall be provided with integral threaded conduit hubs mounted external to the box. Boxes with threaded conduit hubs mounted internal to the box or as part of the box wall are not acceptable.

C. Flush Mount Outlet Boxes
1. Outlet boxes shall be no less than 2-1/8 inches deep, and 4-11/16 inches square. Boxes shall be UL listed and labeled. Pre-punched single diameter conduit knockouts are acceptable; however, concentric and eccentric knockouts are not acceptable.
2. Outlet boxes mounted flush in CU walls shall be made of galvanized, tack welded steel, and suitable for installation in masonry walls. Sectional type boxes are not acceptable for this application.
3. Outlet boxes mounted flush in gypsum walls shall be made of galvanized pressed steel. Tack welded boxes or sectional type boxes are not acceptable for this application.
4. Outlet boxes mounted cast into concrete shall be concrete tight, and shall be made of galvanized steel or PVC.

PART 3 EXECUTION

3.01 INSTALLATION

A. Pull and Junction Boxes
1. Pull boxes and junction boxes shall be solidly attached to structural members prior to installation of conduit and set true and plumb. Boxes shall not be supported by their associated conduits.
2. Wooden plugs are not permitted for securing boxes to concrete. Appropriately rated anchors specifically suited for use in concrete shall be used.
3. Box penetrations for conduits shall be made with a punch tool, and penetrations shall be the size required for the conduit entry and/or hub. Oversized penetrations in boxes are not acceptable.
4. Watertight conduit hubs shall be provided for boxes where a NEMA 4X enclosure rating is specified. Referenced Section 16130, Conduit, for conduit hub requirements.
5. Pull and junction boxes may be installed flush mounted in gypsum, concrete, or CMU walls where appropriate provided that covers are easily removed or opened.
6. Pull and junction boxes shall be provided in the enclosure type and material of construction required for the area in which it is installed. Reference the requirement in Part 2 herein.

B. Outlet Boxes

1. Outlet boxes shall be solidly attached to structural members prior to installation of conduit and set true and plumb. Boxes shall not be supported by their associated conduits.
2. Wooden plugs are not permitted for securing boxes to concrete. Appropriately rated anchors specifically suited for use in concrete shall be used.
3. Flush mounted outlet boxes shall be arranged and located so that tile and grout lines fit closely around the boxes, and so placed that the cover or device plate shall fit flush to the finished wall surface.
4. Outlet boxes shall be flush mounted in finished areas and other areas where practical. Flush mounted outlet boxes shall not be installed in hazardous areas or chemical storage/transfer areas.
5. For the below-named items, mounting heights from finished floor, or finished grade to top is applicable, depending on the type of wiring device to be installed in the outlet box. Mounting heights for outlet boxes shall be as follows, unless otherwise specified herein, indicated on the Drawings, or required by the Americans with Disability Act (ADA):
    a. Light switches and wall mounted occupancy sensors, 48 inches
    b. Receptacles in indoor dry process/non-process areas, 16 inches
    c. Receptacles in indoor wet process areas and all indoor chemical storage/transfer areas, 48 inches
    d. Receptacles in outdoor locations, 24 inches
6. Outlet boxes shall be provided in the material of construction required for the area in which it is installed. Reference the requirements in Part 2 herein.

END OF SECTION

SECTION 26 21 00.03

UTILITY SERVICE ENTRANCE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Utility Coordination Requirements

1.02 RELATED SECTIONS

A. The following Sections have work that is directly related to this Section. This does not relieve the Contractor of his responsibility of proper coordination of all the work:
   1. Trenching for Utilities.
   2. Cast-in-Place Concrete.
   3. Grounding and Bonding.
   4. Conduit.
   5. Duct Bank.

1.03 REFERENCES

A. NECA Standard of Installation

B. ANSI/NFPA 70 - National Electrical Code.

1.04 SYSTEM DESCRIPTION

A. Utility Company: Duke Energy
   1. Customer Service Hotline: (800) 452-2777
   2. Builders Express Phone: (800) 636-0581
   3. E-mail: Builder.Express@pgnmail.com

B. System Characteristics: 120/240 volts, 1 phase, 3 wire, 60 hz.

1.05 SUBMITTALS

A. Submit the following in accordance with Division 1:
   1. Catalog Data: Submit manufacturer’s standard drawings or catalog cuts for the following.
      a. Meter bases.
   2. Manufacturer’s installation instructions.

1.06 QUALITY ASSURANCE

A. Perform Work in accordance with Utility Company requirements.

1.07 REGULATORY REQUIREMENTS

A. Conform to requirements of ANSI / NFPA 70.

1.08 FIELD MEASUREMENTS

A. Verify that field measurements are as indicated on the Drawings.

1.09 REQUIREMENT

A. The Contractor shall examine the site and become familiar with conditions affecting the work. The Contractor shall investigate, determine, and verify locations of any overhead or buried utilities on or near the site, and shall determine such locations in conjunction with all public and/or private utility companies and with all authorities having jurisdiction. All costs, both temporary and permanent to connect all utilities, shall be included in the Bid. The Contractor shall be responsible for scheduling and coordinating with the local utility for temporary and permanent services.

B. The Contractor is responsible for coordinating all electric utility equipment installations with the serving electric utility. The Contractor shall furnish and install all electric utility equipment required by the electric utility to be installed by the Contractor whether specifically shown on the Drawings or not. The Contractor shall furnish and install the following electrical utility equipment as a minimum:
   1. Concrete transformer pads constructed as instructed by the electric utility
   2. Primary and or secondary ductbank and manholes
   3. Metering equipment cabinets and/or bases
   4. Conduit and wire required from metering cabinet to metering current transformers and potential transformers
   5. Secondary conductors
   6. Secondary terminations
      a. The electric utility will furnish and install the following equipment:
   7. Primary conductors and terminations

C. The Contractor is responsible for ensuring all electric utility equipment and construction installed by the Contractor is furnished and installed in accordance with the electric utility's design specifications and requirements. The Contractor is fully responsible for coordinating his scope of work with the electric utility. Any additional required electric utility construction or equipment not specified herein or shown on the Drawings shall be supplied by the Contractor at no additional cost to the Owner.

PART 2 PRODUCTS

2.01 NOT USED

PART 3 EXECUTION

3.01 PREPARATION

A. Provide temporary electric service in conformance with requirements of Section 01500, Temporary Facilities.

B. Obtain permanent electric service to the facility in a timely manner to meet the requirements of the construction schedule. Establish account with Utility in Owner's name. Contractor shall not use the permanent electric service for construction of project. Permanent electric service shall only be used for testing of equipment after installation. All usage fees acquired during testing by the Contractor from the Utility shall be paid for by the Contractor until the point of substantial completion has been obtained. Once substantial completion is obtained, the Owner shall then pay for usage fees. All fees from the Utility in regards to establishing a physical permanent electric service to the site shall be paid for by the Owner, separate from this Contract.

C. Coordinate location of Utility Company's facilities to ensure proper access is available.

3.02 INSTALLATION

A. Install the meter base in accordance with utility requirements. Coordinate with the Utility and Owner for location of meter base. Furnish and install necessary mounting as required.

B. Provide and install Schedule 80 PVC conduit from utility power pole below grade to new meter base with pull string. Coordinate size of conduit and routing of conduit with utility company. Install in strict accordance with utility standards.

C. Provide service from load side of meter to service equipment.

END OF SECTION

SECTION 26 24 16.03

PANELBOARDS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Lighting panelboards

1.02 RELATED SECTIONS

A. The following Sections have work that is directly related to this Section. This does not relieve the Contractor of his responsibility of proper coordination of all the work:
   1. Grounding and Bonding
   2. Supporting Devices
   3. Electrical Identification

1.03 REFERENCES

A. NECA (National Electrical Contractors Association) - Standard of Installation.

B. NEMA AB 1 - Molded Case Circuit Breakers.

C. NEMA ICS 2 - Industrial Control Devices, Controllers, and Assemblies.

D. NEMA PB 1 - Panelboards.

E. NEMA PB 1.1 - Instructions for Safe Installation, Operation and Maintenance of Panelboards Rated 600 Volts or Less.

F. NFPA 70 - National Electrical Code.

1.04 SUBMITTALS

A. Submit under provisions of Division 1.
   1. Indicate outline and support point dimensions, voltage, main bus ampacity, integrated short circuit ampere rating, circuit breaker arrangement and sizes.
   2. Manufacturer's Installation Instructions: Indicate application conditions and limitations of use stipulated by Product testing agency. Include instructions for storage, handling, protection, examination, preparation, and installation of Product.

1.05 PROJECT RECORD DOCUMENTS

A. Submit under provisions of Division 1.

B. Record actual locations of Products; indicate actual branch circuit arrangement.

1.06 OPERATION AND MAINTENANCE DATA

A. Submit under provisions of Division 1.

B. Maintenance Data: Include spare parts data listing; source and current prices of replacement parts and supplies; and recommended maintenance procedures and intervals.

1.07 QUALITY ASSURANCE

A. Perform Work in accordance with NECA Standard of Installation.

B. Maintain one copy of each document on site.

1.08 REGULATORY REQUIREMENTS

A. Conform to requirements of NFPA 70.

B. Furnish products listed and classified by UL or other North Carolina Recognized Third Party Testing Agency.

1.09 FIELD MEASUREMENTS

A. Verify that field measurements are as indicated.

1.10 MAINTENANCE MATERIALS

A. Provide maintenance materials under provisions of Division 1.

B. Provide two of each panelboard key.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. The Equipment shall be designed, constructed and installed in accordance with the best practices of the trade, and shall operate satisfactorily when installed as shown on the Drawings.

2.02 CONDUCTORS (MAIN BUS AND BRANCH CONNECTORS)

A. All main bus shall be copper sized in accordance with UL standards to limit the temperature rise on any current carrying part to a maximum of 50 degrees C above a maximum ambient temperature of 40 degrees C.

2.03 LIGHTING PANELBOARDS

A. General
   1. Lighting panelboards shall be dead-front type with automatic trip-free, non-adjustable, thermal-overload, branch circuit breakers. Panelboards shall be of the configuration and rating as specified herein and indicated on the Drawings. Panelboards shall be service entrance rated where indicated on the Drawings.
   2. Lighting panelboards shall be equipped with a main breaker or main lugs complete with branch circuit breakers, as indicated on the Drawings. The panelboards shall be suitable for flush or surface mounting.
   3. Lighting panelboards shall be fully rated and shall have a minimum short circuit rating of 22,000 amperes symmetrical, unless otherwise indicated on the Drawings.
   4. Lighting panelboards shall be Eaton Pow-R-Line Series, the Square D Company equivalent, the General Electric Company equivalent, or Siemens Energy and Automation, Inc. equivalent.

B. Enclosures
   1. Enclosures shall have a NEMA rating as indicated on the Drawings, and be constructed of No. 12 U.S.S. code gauge galvanized steel. The door shall be fastened to the enclosure with concealed hinges and shall be equipped with flush-type catches and locks. The Contractor shall equip cabinet doors exceeding 40 inches in height with vertical bolt three point locking mechanism. All locks shall be keyed alike. The panelboard trim shall have a

removable hinge assembly, in addition to the door hinge, that allows work inside the enclosure without the need to remove the trim. The enclosure shall have wiring gutters on sides and shall be at least 5-3/4 inches deep. The panelboard shall be provided with an information label. The information label shall include the panelboard designation, voltage, phase, wires, and bus rating.

2. All metal surfaces of the panelboard enclosures shall be thoroughly cleaned and given one prime of zinc chromate primer. All interior surfaces shall then be given one shop finishing coat of a lacquer of the nitro cellulose enamel variety. All exterior surfaces shall be given three coats of the same lacquer. The color of finishing coats shall be light gray ANSI #61.
3. An Underwriter's Laboratories, Inc. inspection label shall appear on the interior of the cabinet.

C. Bus Work
1. Main bus bars shall be of ample size so that a current density of not more than 1000 amperes per square inch of cross section will be attained. This current density shall be based on the application of the full load connected to the panel plus approximately 25% of the full load for spare capacity. The main bus shall be full capacity as based on the preceding for the entire length of the panel so as to provide full flexibility of circuit arrangement.
2. Solid neutral bus bars are required and neutral bus ampacity shall be the same as the main bus bars unless otherwise noted. Ratings shall be in accordance with applicable standards.
3. A separate ground bus shall be provided with lugs for termination of equipment grounding conductors.
4. Branch bus work shall be rated to match the maximum branch circuit breaker which may be installed in the standard space.
5. All bus shall be tin plated copper and shall extend the entire useable length of the panelboard, including spaces.

D. Circuit Breakers
1. Circuit breakers shall be bolt-on, molded-case type conforming to NEMA Standard AB 1. All circuit breakers shall have quick-make, quick-break, toggle mechanism for manual as well as automatic operation. Tandem or half-size circuit breakers are not acceptable
2. Where indicated on the Drawings, or where required by Code, circuit breakers shall be equipped with integrally mounted ground fault interrupters complete with "TEST" push button and shall be of a type which fit standard panelboard spaces for the breaker continuous current rating required. Circuit breakers used for lighting circuit switching shall be approved for the purpose and shall be marked "SWD". Where required by Article 440 of the NEC, circuit breakers installed for air conditioning units shall be HACR type.
3. Circuit breaker voltage ratings shall meet or exceed the panelboard voltage indicated on the Drawings. Trip elements of circuit breakers shall be 20A unless otherwise indicated on the Drawings. Circuit breakers shall have an interrupting rating at 240 VAC that matches the panelboard short circuit rating.
4. Where indicated on the Drawings, branch circuit breakers shall be provided with a padlockable hasp or handle padlock attachment for padlocking in the off position as required to meet the NEC requirement for disconnecting means and/or OSHA lock-out/tagout standard. Locking hardware shall remain in place even when the padlock is removed. Branch circuit breakers used for control, instrumentation, telephone, fire alarm, or auxiliary equipment circuits requiring

continuous operation shall be provided with a similar lock on device where indicated on the Drawings.

E. Directories
   1. Approved directories with noncombustible plastic cover, and with typewritten designations of each branch circuit, shall be furnished and installed in each panelboard. The Contractor shall maintain in each panel, during the duration of the Contract, a handwritten directory clearly indicating the circuit breakers in service. This directory shall be updated as work progresses, and final, typewritten directories, as specified above, shall be installed at the end of the project. Designations and circuit locations shall conform to the panelboard schedules on the Drawings, except as otherwise authorized by the Engineer.

2.04 SURGE PROTECTIVE DEVICES

A. Surge protective devices shall be provided in a separate enclosure external to the panelboard enclosure. See Section 26 43 00 – Surge Protective Devices for panelboard SPD requirements.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install panelboards in accordance with NEMA PB 1.1.

B. Install panelboards plumb. Provide supports in accordance with Section 16070.

C. Height: 6 ft to top of panelboard unless conditions dictate otherwise.

D. Provide filler plates for unused spaces in panelboards.

E. Provide typed circuit directory for each branch circuit panelboard. Revise directory to reflect circuiting changes required to balance phase loads.

F. In continuously wet locations, space panelboards 1-inch off mounting surface.

G. Provide engraved plastic nameplates under the provisions of Section 16075.

3.02 FIELD QUALITY CONTROL

A. Field-testing will be performed under provisions of Division 1.

B. Measure steady state load currents at each panelboard feeder; rearrange circuits in the panelboard to balance the phase loads to within 20 percent of each other. Maintain proper phasing for multi-wire branch circuits.

C. Visual and Mechanical Inspection: Inspect for physical damage, proper alignment, anchorage, and grounding. Check proper installation and tightness of connections for circuit breakers.

END OF SECTION

SECTION 26 43 00

SURGE PROTECTIVE DEVICES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Surge protective devices for branch panelboard locations.

B. Surge-protective devices for low-voltage signal, data, and instrumentation circuits.

1.02 RELATED REQUIREMENTS

A. Section 26 05 26 - Grounding and Bonding for Electrical Systems.

B. Section 26 24 16 - Panelboards.

1.03 ABBREVIATIONS AND ACRONYMS

A. EMI/RFI: Electromagnetic Interference/Radio Frequency Interference.

B. SPD: Surge Protective Device.

1.04 REFERENCE STANDARDS

A. NECA 1 - Standard for Good Workmanship in Electrical Construction.

B. NEMA EN 10250 - Enclosures for Electrical Equipment (1000 Volts Maximum).

C. NFPA 70 - National Electrical Code.

D. UL 1449 - Standard for Surge Protective Devices.

E. UL 497B - Standard for Protectors for Data Communication.

F. IEC 61643-21 - Low-voltage SPD - Telecommunications and Signaling Networks.

1.05 ADMINISTRATIVE REQUIREMENTS

A. Coordination: Coordinate size and location of overcurrent device compatible with the actual surge protective device and location to be installed. Notify The Wooten Company of any conflicts or deviations from Contract Documents to obtain direction prior to ordering equipment.

1.06 SUBMITTALS

A. See Section 01 33 00 Submittal Procedures, for submittal procedures.

B. Product Data: Include detailed component information, voltage, surge current ratings, repetitive surge current capacity, voltage protection rating (VPR) for all protection modes, maximum continuous operating voltage (MCOV), nominal discharge current (I-n), short circuit current rating (SCCR), connection means including any required external overcurrent protection, enclosure ratings, outline and support point dimensions, weight, service condition requirements, and installed features.
   1. SPDs with EMI/RFI filter: Include noise attenuation performance.

C. Shop Drawings: Include wiring diagrams showing all factory and field connections with wire and circuit breaker/fuse sizes.

D. Certificates: Manufacturer's documentation of listing for compliance with the following standards:
   1. UL 1449.
   2. UL 1283 (for Type 2 SPDs).

E. Manufacturer's Installation Instructions: Include application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation, and installation of product.

F. Operation and Maintenance Data: Include information on status indicators and recommended maintenance procedures and intervals.

G. Project Record Documents: Record actual connections and locations of surge protective devices.

1.07 DELIVERY, STORAGE, AND PROTECTION

A. Store in a clean, dry space in accordance with manufacturer's written instructions.

1.08 FIELD CONDITIONS

A. Maintain field conditions within manufacturer's required service conditions during and after installation.

1.09 WARRANTY

A. See Section 01 70 00 Execution & Closeout Requirement, for additional warranty requirements.

B. Manufacturer's Warranty: Provide minimum 20 year warranty covering repair or replacement of surge protective devices showing evidence of failure due to defective materials or workmanship.

C. Exclude surge protective devices from any clause limiting warranty responsibility for acts of nature, including lightning, stated elsewhere.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Field-Installed, Externally Mounted Surge Protective Devices:
   1. ABB; Current Technology
   2. ASCO; Advanced Protection Technologies
   3. Eaton
   4. Schneider Electric
   5. Surge Suppression, LLC (SSI)

B. Substitutions: See Section 01 60 00 - Product Requirements.

C. Source Limitations: Provide surge protective devices produced by single manufacturer and obtained from single supplier.

2.02 SURGE PROTECTIVE DEVICES - GENERAL REQUIREMENTS

A. Description: Factory-assembled surge protective devices (SPDs) for 60 Hz service; listed, classified, and labeled as suitable for the purpose intended; system voltage as indicated on the drawings.

B. Unless otherwise indicated, provide field-installed, externally-mounted or factory-installed, internally-mounted SPDs.

C. List and label as complying with UL 1449, Type 1 when connected on line side of service disconnect overcurrent device and Type 1 or 2 when connected on load side of service disconnect overcurrent device.

D. Protected Modes:
   1. Wye Systems: L-N, L-G, N-G, L-L.
   2. Delta Systems: L-G, L-L.
   3. Single Split Phase Systems: L-N, L-G, N-G, L-L.
   4. High Leg Delta Systems: L-N, L-G, N-G, L-L.

E. UL 1449 Voltage Protection Ratings (VPRs):
   1. 208Y/120V System Voltage: Not more than 1,000 V for L-N, L-G, and N-G modes and 1,200 V for L-L mode.
   2. 240/120V System Voltage: Not more than 1,000 V for L-N, L-G, and N-G modes and 1,200 V for L-L mode.
   3. 480Y/277V System Voltage: Not more than 1,500 V for L-N, L-G, and N-G modes and 2,000 V for L-L mode.
   4. 480V Delta System Voltage: Not more than 1,800 V for L-G mode and 3,000 V for L-L mode.

F. UL 1449 Maximum Continuous Operating Voltage (MCOV): Not less than 115% of nominal system voltage.

G. Enclosure Environment Type per NEMA EN 10250: Unless otherwise indicated, as specified for the following installation locations:
   1. Indoor clean, dry locations: Type 1.
   2. Outdoor locations: Type 4X.

2.03 SURGE PROTECTIVE DEVICES FOR BRANCH PANELBOARD LOCATIONS

A. Surge Protective Device - Basis of Design: Surge Suppression, LLC (SSI); Advantage Series; Model SKLD (120 kA/phase, Type 1, I-n = 20 kA).
   1. Voltage: As indicated on drawings.
   2. Features: Discrete "all-mode" protection (10 modes for 3-phase wye circuits); component-level thermal fusing; internal circuit board-mounted overcurrent fusing; 200 kAIC SCCR; 25 year warranty.
   3. Include the following options:
      a. AC10 - Basic internal audible alarm with dry relay contacts.
      b. D1 - NEMA 1, 2, 3, 3S, 4X, and 12 composite enclosure with integral non-fused disconnect switch, with external handle

2.04 SIGNAL-LINE SURGE PROTECTIVE DEVICES

A. Description: DIN-rail or in-line plug-in modules listed to UL 497B and compliant with IEC 61643-21, Class D1, for circuits ≤ 150 V.

B. Manufacturers:
   1. Phoenix Contact – SURGETRAB MCR-24-5 (4-20 mA / discrete)
   2. MTL Instruments – SD-Series (e.g., SD-07)
   3. Transtector – DA-10G-RJ45 (Ethernet / PoE)
   4. PolyPhaser – IS-B50LU-C2 (coax)
   5. Substitutions: See Section 01 60 00 - Product Requirements.

C. Performance:
   1. Nominal discharge current ≥ 10 kA (8/20 µs).
   2. Let-through voltage ≤ 1 kV at IN.
   3. Response time ≤ 1 ns.

D. Performance:
   1. Provide one SPD per:
      a. 4-20 mA analog loop
      b. Discrete contact I/O
      c. RS-485 / serial data (if used)
      d. Ethernet / CAT-6
      e. Coaxial antenna feed (if applicable)

E. Accessories: Pluggable cartridges with visual fault indicator; hot-swappable.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that field measurements are as indicated.

B. Verify that the service voltage and configuration marked on the SPD are consistent with the service voltage and configuration at the location to be installed.

C. Verify system grounding and bonding is in accordance with Section 26 05 26, including bonding of neutral and ground for service entrance and separately derived systems where applicable. Do not energize SPD until deficiencies have been corrected.

D. Verify that conditions are satisfactory for installation prior to starting work.

3.02 INSTALLATION

A. Perform work in accordance with NECA 1 (general workmanship).

B. Install products in accordance with manufacturer's instructions.

C. Arrange equipment to provide minimum clearances in accordance with manufacturer's instructions and NFPA 70.

D. Unless indicated otherwise, connect service entrance surge protective device on load side of service disconnect main overcurrent device.

E. Provide conductors with minimum ampacity as indicated on the drawings, as required by NFPA 70, and not less than manufacturer's recommended minimum conductor size.

F. Install conductors between SPD and equipment terminations as short and straight as possible, not exceeding manufacturer's recommended maximum conductor length. Breaker locations may be reasonably rearranged in order to provide leads as short and straight as possible. Twist conductors together to reduce inductance.

G. Do not energize SPD until bonding of neutral and ground for service entrance and separately derived systems is complete in accordance with Section 26 05 26 where applicable. Replace SPDs damaged by improper or missing neutral-ground bond.

H. Disconnect SPD prior to performing any high potential testing. Replace SPDs damaged by performing high potential testing with SPD connected.

I. Install signal-line SPDs within 12 in. of the point where each circuit enters the SCADA panel. Bond SPD ground terminals to the panel ground bar as specified in Section 26 00 02, Article 3.06 (Grounding).

3.03 FIELD QUALITY CONTROL

A. See Section 01 45 00 Quality Control, for additional requirements.

3.04 CLEANING

A. Repair scratched or marred exterior surfaces to match original factory finish.

END OF SECTION

SECTION 26 51 00.03

LUMINAIRES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Luminaires.

B. LED Fixtures.

1.02 RELATED SECTIONS

A. The following Sections have work that is directly related to this Section. This does not relieve the Contractor of his responsibility of proper coordination of all the work:
   1. Boxes

1.03 REFERENCES

A. Underwriter's Laboratories, Inc. (UL):
   1. UL 924 – Emergency Lighting and Power Equipment
   2. UL 844 – Luminaires for Use in Hazardous (Classified) Locations
   3. UL 1598 – Luminaires

B. American National Standards Institute (ANSI):
   1. ANSI C62.41 – Guide for Surge Voltages in Low-Voltage AC Power Circuits

C. National Electrical Code (NEC), latest edition.

1.04 SUBMITTALS

A. Submit under provisions of Division 1.
   1. Shop Drawings: Indicate dimensions and components for each luminaire that is not a standard product of the manufacturer.
   2. Product Data: Provide dimensions, ratings, and performance data.
   3. Pole calculations.

1.05 PROJECT RECORD DOCUMENTS

A. Submit under provisions of Division 1.

B. Accurately record actual locations of each luminaire.

1.06 OPERATION AND MAINTENANCE DATA

A. Submit under provisions of Division 1.

B. Product Data: Provide lamp requirements, listing of available accessories, and photometric data.

C. Maintenance Data: Include available accessories data listing, source and current prices of accessories, and recommended cleaning and maintenance procedures.

1.07 REGULATORY REQUIREMENTS

A. Conform to requirements of ANSI/NFPA 70.

B. Conform to requirements of NFPA 101.

C. Furnish products listed and classified by Underwriters Laboratories, Inc. or other North Carolina recognized third party testing agency.

PART 2 PRODUCTS

2.01 LUMINAIRES

A. Each fixture shall bear the Underwriters Laboratories, Inc. label. All lighting fixture shall be furnished complete with lamps of the size and type as indicated on the Drawings and all fittings and hardware necessary for a complete installation. Lighting fixtures shall have all the parts and fittings necessary to completely and properly install the fixtures.

B. Fixture leads shall be required by NEC and shall be grounded by the equipment grounding conductor in the conduit.

C. All glassware shall be high quality, homogeneous in texture, uniform in quality, free from defects, of uniform thickness throughout, and properly annealed. Edges shall be rounded and free from chips or rough edges.

D. Fixtures specified to be damp or wet locations rated shall be UL 1598 listed.

E. Substitutions: Under provisions of Division 1.

F. Fixtures shall be as specified in the fixture schedule on the Drawings.

2.02 LED DRIVERS

A. Drivers shall have a voltage range of (120-277) +/- 10% at a frequency 60 Hz.

B. All drivers shall be designed to a power factor >90% with a total harmonic distortion THD <20% at full load.

C. Case temperature shall be rated for -40°C through +80°C.

D. Drivers shall have overheat protection, self-limited short circuit protection and overload protection.

E. Drivers shall be furnished with a fused primary.

F. Drivers shall have an output current ripple <30%

G. Drivers shall have a five year (50,000 hour) warranty.

H. Drivers shall be manufactured by Advance, Universal, or equal.

I. Drivers shall be UL Listed for damp location, UL 1012, UL 935, & ROHS.

J. Drivers shall meet FCC 47 Sub Part 15.

K. All Drivers shall be provided with ANSI/IEEE C62.41 Category C (10kV/5kA) surge protection.

2.03 LEDS

A. Luminaires provided with LED technology shall utilize high brightness LEDs with a group binning code of P and/or Q.

B. Junction point shall be designed and manufactured to allow adequate heat dissipation.

C. LEDs shall be rated for 50,000 hours of life, minimum.

2.04 POLES

A. Poles shall be designed to withstand calculated wind force based on wind velocity in accordance with the provisions of the North Carolina Building Code.

B. Pole mounted fixtures shall be mounted on poles as designated in the fixture schedule or as indicated on the Drawings. Poles shall have adequate handholes and weatherproof receptacles where indicated. All anchor bolts and nuts shall be stainless steel.

2.05 LIGHTING CONTROLS

A. Lighting contactors shall be as manufactured by Eaton, the Square D Company, General Electric Company, or Siemens Energy and Automation, Inc. Lighting contactors shall be heavy duty industrial type with 30A minimum rating and shall have the number of contacts required. Contactor ampere rating shall be increased as required to suit the application. Contactor coil voltage shall be as indicated on the Drawings. Contactors shall be the electrically or mechanically held type as indicated on the Drawings. Contactors shall include fused integral control power transformers. Any auxiliary relays, or other devices required for proper operation shall be included.

B. In non-hazardous locations, lighting contactors shall be furnished with the following enclosure type and material of construction, dependent upon the designation of the area in which they are to be installed. Area designations are indicated on the Drawings.
   1. Indoor Wet Process Area – NEMA 4X, Type 304 Stainless Steel
   2. Indoor Dry Process Area – NEMA 12, Painted Steel
   3. Indoor Dry Non-process Area – NEMA 1, Painted Steel
   4. Indoor Chemical Storage/Transfer Area – NEMA 4X, Type 304 Stainless Steel
   5. All Outdoor Areas – NEMA 4X, Type 304 Stainless Steel

C. Photocells shown on the Drawings that are not integral to a fixture provided by the (lighting manufacturer) shall be provided by the Contractor. Photocells shall be rated for 120 VAC, 1800W, and be provided with 1/2” or 3/4” threads for box mounting. Photocells shall be Model K4121C by Intermatic, or equal.

PART 3 EXECUTION

3.01 INSTALLATION

A. Lighting fixtures shall be located symmetrically with building lines as shown on the Drawings. The Contractor shall furnish and install the lighting fixtures to allow "convenient" access for maintenance such as cleaning, and other activities. The fixtures shall be installed to be accessed by a 12 ft. (max.) ladder. Where fixtures are shown in locations on the Drawings where maintenance would be difficult, the Contractor shall notify the Engineer for direction.

B. The Contractor shall provide and install all inserts, conduit, structural supports as required, poles, wiring, and any other items required for a complete system. Contractor shall properly adjust and test, to the satisfaction of the Engineer, the entire lighting system. The Contractor shall provide pigtails and flexible conduit connected to an outlet box where necessary or required resulting in a neat and complete installation.

C. The Contractor shall protect all fixtures at all times from damage, dirt, dust, and the like. Before final acceptance, all fixtures and devices shall be cleaned of all dust, dirt or other material, be fully re-lamped (except LED fixtures) and in operating condition to the satisfaction of the Engineer.

D. The Contractor shall furnish and install all pendant trapezes and pendant stem hangers with durable swivel or equivalent trapeze hanger permitting normal fixture motion and self-alignment. Fixture pendants shall be Appleton Type UNJ ball type flexible hanger at the fixture and supports from an Appleton JBLX junction box with JBLX hub cover, or equal. Pendant lengths shall be adequate and adjusted to provide uniformity of installation heights above the reference datum. Stems shall be one piece, with matching canopies and fittings.

E. Fixtures located on the exterior of the building shall be provided with neoprene gasket and non-ferrous metal screws finished to match the fixtures.

F. The finish or exposed metal parts of lighting fixtures and finish trims of all recessed lighting fixtures shall be as directed by the Engineer.

G. The Contractor shall furnish and install recessed fixtures with a separate junction box concealed and located as to be accessible when fixture is removed.

H. The Contractor shall furnish and install all boxes for lighting fixtures such that the box is not the sole support of the fixture. The boxes shall be offset to allow maintenance such that access to wiring within the box can be attained without having to consider supporting (holding) the fixture.

I. All lighting units, when installed, shall be set true and be free of light leaks, warps, dents, and other irregularities. All hangers, cables, supports, channels, and brackets of all kinds for safely erecting this equipment in place, shall be furnished and erected in place by the Contractor.

J. The Contractor shall install fixtures at mounting heights indicated on the Drawings or as instructed by the Engineer. In areas with exposed ducts and/or piping, installation of lighting fixtures shall be adapted to field conditions as determined by the Engineer.

K. The Contractor shall support each fixture securely. Each fluorescent fixture shall be secured to the building structure. The Contractor shall not secure fixtures to the work of other trades, unless specified or noted otherwise, and shall not support fixtures from plaster. The Contractor shall furnish and install all steel members and supports as required to fasten and suspend fixtures from the structure.

L. In all mechanical equipment areas, the Contractor shall install lighting fixtures on the ceiling after all piping and equipment therein has been installed. Exact locations for such fixtures may be determined by the Engineer on the site during the course of the work.

M. Upon completion of work, and after the building area is broom clean, all fixtures shall be made clean and free of dust and all other foreign matter both on visible surfaces, and on surfaces that affect the lighting performance of the fixture including diffusers, lenses, louvers, and reflectors.

N. All fixtures that require physical adjustment shall be so adjusted in accordance with the directions of the Engineer. The Contractor shall also adjust angular direction of fixtures and/or lamps, as directed.

O. Access to fixtures including LED fixtures shall require no special tools. All optical control surfaces such as lenses and reflectors shall be safely and securely attached to fixtures and shall be easily and quickly removed and replaced for cleaning without the use of special tools. No fixture part that may be removed, for maintenance, shall be held in place by metal tabs that must be bent to remove said part.

P. The Contractor shall furnish and install time switches and photocells as specified herein or indicated on the Drawings. Time switches shall be provided with a manual bypass switch controlling the lights locally and remotely. Time switches shall control contactors, relays, or direct controlling of one, two, or three lighting circuits, as indicated. The Contractor shall furnish and install photocells as specified herein or indicated on the Drawings for automatic "ON/OFF" switching of outdoor lighting.

Q. Lighting contactors shall be provided in the enclosure type and material of construction required for the area in which it is installed. Reference the requirements in Part 2 herein, and the area designations indicated on the Drawings.

R. The Contractor shall furnish and install a concrete foundation for the pole mounted fixtures as required. This applies to foundations for pole mounted fixtures located in the yard (i.e., site lighting) and foundations that are part of a structure (e.g., filters). Foundation shall be approved by a Professional Structural Engineer currently registered in the State of North Carolina. The wind design shall be in accordance with ASCE 7 and the North Carolina Building Code. Pole structure/foundation shall be able to handle fixture/pole weight and withstand wind velocity of up to 110 mph with a 1.3 gust factor. Provide calculations signed and sealed by a Professional Structural Engineer for review.

S. One (1), 3/4" diameter, 10’-0” long ground rod, furnished in accordance with Section 16060, Grounding & Bonding, shall be driven adjacent to each pole. The pole, anchor bolts, steel reinforcement bar in the base, and equipment grounding conductor shall all be bonded to the ground rod.

3.02 FIELD QUALITY CONTROL

A. Operate each luminaire after installation and connection. Inspect for proper connection and operation.

3.03 ADJUSTING

A. Adjust Work under provisions of Division 1.

B. Replace luminaires that have failed at Substantial Completion.

3.04 CLEANING

A. Clean electrical parts to remove conductive and deleterious materials.

B. Remove dirt and debris from enclosure.

C. Clean photometric control surfaces as recommended by manufacturer.

D. Clean finishes and touch up damage.

END OF SECTION

SECTION 31 11 00

CLEARING AND GRUBBING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Work shall include, but not be limited, to the following:
   1. Clearing and grubbing.
   2. Removal of surface debris.
   3. Access roads.
   4. Temporary and permanent ground cover.

1.02 RELATED SECTIONS

A. The following Sections have work that is directly related to this Section. This does not relieve the Contractor of his responsibility of proper coordination of all the work:
   1. Section 31 25 00, Erosion Control
   2. Section 33 92 00, Lawns and Grasses.

1.03 WARRANTY AND FINES

A. Contractor is liable for damages to public and private property and fines as may be placed on the Project by the governing agencies due to failure to provide adequate erosion control devices.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 PROTECTION

A. Take reasonable care during construction to avoid damage to vegetation outside of the construction limits. Temporarily tie back ornamental shrubbery and tree branches, where appropriate, to minimize damage. Trees that receive damage to branches shall be trimmed of those branches to improve the appearance of the tree. Treat tree trunks damaged by equipment with a tree dressing.

B. Locate and protect property corners and survey control stakes prior to start of clearing operations.

C. Provide temporary gates and fences as necessary to prevent unauthorized vehicular access to the site.

D. Mark clearing limits.

E. Refer to paragraph 5.05 of the General Conditions concerning the protection of Underground Facilities.

3.02 INSTALL EROSION CONTROL DEVICES

A. Clear areas required to install erosion control devices, which shall be in place and operational prior to other land disturbing activity. Install erosion control devices in accordance with Section 31 25 00, Erosion Control.

3.03 CLEARING AND GRUBBING

A. Grub within the permanent easement only as necessary for the installation of the work. Do not grub within the temporary construction easement.

B. Clearing shall consist of cutting and removal of vegetation to the existing ground surface and removal of debris. Debris shall include, but not be limited to, fences, steps, walls, chimneys, footings, foundation slabs, basements, signs, junked vehicles, and other rubble.

C. Grubbing shall consist of the removal of roots over 3 inches in diameter, matted roots, stumps, and other vegetable matter to 12 inches below existing grade.

D. Do not precede grading operation by grubbing operation by more than seven days.

E. Fill holes and depressions and bring cleared and grubbed area to a uniform contour to match existing grade. Provide positive drainage.

F. Remove and properly dispose of cleared and grubbed material from the site. Make reasonable effort to channel timber resulting from clearing operations into a beneficial use.

G. Burning shall not be permitted at the site.

3.04 ACCESS ROAD

A. Clear for access road.

B. Clear and grub access road for construction traffic. Access road clearing shall not extend outside of easement or be wider then 30-feet without Engineer's approval.

C. Access road shall have the following:
   1. Provide “Temporary Construction Entrance” per the standard detail on the Drawings at connection to State Roads.
   2. 6 inches of ABC stone.
   3. Provide temporary seeding of shoulders as access drive is installed.
   4. Provide storm pipes sized for the upstream drainage basin and a minimum of a 10-year storm event under drives at points of concentrated water flow. Contractor shall be responsible for flood damage.

D. Allow reasonable use of access drive by other Contractors, Owner, Engineer, and others authorized to be on the site by the Owner.

E. When no longer required remove stone and restore access drive to original contours. Scarify and seed access drive area.

END OF SECTION

SECTION 31 23 33

TRENCHING & BACKFILLING FOR UTILITIES

PART 1 GENERAL

1.01 SCOPE

A. Provide labor, equipment, and material to perform required excavating, backfilling, and compacting for utilities and related structures as specified herein and indicated on the Drawings. Work shall include, but not be limited to, the following:
   1. Survey staking as required for construction.
   2. Protection of existing improvements.
   3. Location of installed utilities.
   4. Use of explosives.
   5. Dewatering.
   6. Excavating, backfilling, and compacting for utilities.
   7. Installation of warning / identification tape and tracer wire.
   8. Borrow material.
   9. Disposal of surplus material.
   10. Soil Testing.

1.02 RELATED SECTIONS

A. The following Sections have work that is directly related to this Section. This does not relieve the Contractor of his responsibility of proper coordination of all the work:
   1. Section 31 11 00 Clearing and Grubbing
   2. Section 31 25 00 Erosion and Sedimentation Control
   3. Section 32 92 00 Lawns and Grasses
   4. Section 33 14 13 Water Distribution System

1.03 REFERENCED STANDARDS

A. ASTM D698 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft3 (600 kN-m/m3)).

B. ASTM D2487 - Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System).

C. N.C. Department of Transportation - Standard Specifications for Roads and Structures (NCDOT). July 2018 or latest

D. Uni-Bell PVC Pipe Association
   1. Recommended Practice for the Installation of Polyvinyl Chloride (PVC) Sewer Pipe.

1.04 DEFINITIONS

A. Backfill: A specified material used in filling the excavated trench and placed at a specified degree of compaction.
   1. Materials: Materials listed herein include processed materials plus the soil classifications listed under the Unified Soil Classification System, (USCS) (Method ASTM D2487 and Practice D2488). The soil materials are grouped into five broad categories according to their suitability for this application.

a. Class I: Angular, 6 to 40-mm (1/4 to 1-1/2-in), graded stone, including a number of fill materials that have regional significance such as coral, slag, cinders, crushed stone, and crushed shell.
b. Class II: Coarse sands and gravels with maximum particle size of 40 mm (1-1/2 in.), including various graded sands and gravels containing small percentages of fines, generally granular and noncohesive, either wet or dry. Soil Types GW, GP, SW, and SP are included in this class.
c. Class III: Fine sand and clayey gravels, including fine sands, sand-clay mixtures, and gravel-clay mixtures. Soil Types GM, GC, SM, and SC are included in this class.
d. Class IV: Silt, silty clays, and clays, including inorganic clays and silts of medium to high plasticity and liquid limits. Soil Types MH, ML, CH and CL are included in this class. These materials shall not be used for bedding, haunching, or initial backfill.
e. Class V: This class includes the organic soils OL, OH, and PT as well as soils containing frozen earth, debris, rock larger than 40 mm (1 1/2 in.) in diameter, and other foreign materials. These materials shall not be used for bedding, haunching, or initial backfill.

2. Backfill Zones: Each backfill zone shall extend the full width of the trench bottom.
a. Foundation: Extending down from the bottom of bedding zone as defined below.
b. Pipe Embedment
1) Bedding: Extending from 4 inches below the pipe bottom to the pipe bottom for 30-inch diameter and smaller and 6 inches below the pipe bottom for pipes larger than 30 inches in diameter.
2) Haunching: Extending from the bedding (bottom of the pipe) to the pipe spring line.
3) Initial Backfill: Extending from the haunching (pipe spring line) to 1 foot above the top of the pipe.
c. Final Backfill: Extending from the initial backfill to the finish ground elevation.

B. Laying Conditions:
1. Type 1: Flat bottom trench with loose backfill.
2. Type 2: Flat bottom trench with backfill lightly consolidated to centerline of pipe.
3. Type 3: Pipe bedded in 4 inches minimum of loose soil and backfill lightly consolidated to top of pipe.
4. Type 4: Pipe bedded on Class I material to 1/8 pipe diameter (4 inch minimum) Backfill compacted to top of pipe a minimum of 80 percent of standard proctor.
5. Type 5: Pipe bedded in compacted Class I material to pipe centerline with 4-inch minimum under pipe. Backfill to top of pipe with Class I, II, or III and compact to 90 percent of standard proctor.

C. Compaction: Process of mechanically stabilizing a material by increasing its density at a controlled moisture condition. "Degree of compaction" shall be expressed as a percentage of the maximum dry density obtained by the test procedure presented in ASTM ASTM D698 (Standard Proctor).

D. Excavation: The removal of soil or rock to obtain a specified depth or elevation.

E. Hard Material: Solid, homogeneous material which is not included in the definition of "rock" but which may require the use of heavy excavation equipment with ripper teeth. Amount must exceed 1 cubic yard in volume. Material having a standard penetration resistance as determined by ASTM D1586 between 60 and 150 blows per foot is defined as "hard material."

F. Lift: Layer of soil placed on top of a previously prepared or placed soil.

G. Rock: Solid, homogeneous material which cannot be removed without the systematic drilling and blasting exceeding 1 cubic yard in volume. Material having a standard penetration resistance as determined by ASTM D1586 greater than 150 blows per foot is defined as "rock." Removal of "hard material" will not be considered rock excavation because of intermittent drilling and blasting that is performed merely to increase production.

H. Pipe Springline: A line running horizontally through the center of the pipe.

I. Topsoil: Natural, friable soil, representative of productive soils in the vicinity of the site. Topsoil shall be free from roots, stones larger than 1 inch, objectionable weed seeds, toxic substances, and materials that hinder grading, planting, and maintenance operations.

1.05 SUBMITTALS

A. Submit the following in accordance with Section, Submittal Procedures:
   1. Catalog Data: Submit manufacturer's standard drawings or catalog cuts for the following. Clearly indicate equipment to be furnished for the Project including options to be provided.
      a. Warning / Identification tape.
   2. Test Reports: Submit for the following:
      a. Moisture-density relations of soils.
      b. Field moisture content.
      c. Soil classification.
      d. In-place field density.
      e. Geotechnical engineer's daily field reports.

PART 2 PRODUCTS

2.01 STONE

A. Class I material shall be #67 or #78M stone in accordance with NCDOT specifications Section 1005, General Requirements for Aggregate.

2.02 WARNING AND IDENTIFICATION TAPE

A. Tape shall be a minimum 3-inch wide polyethylene plastic tape or approved equal, manufactured specifically for identification of buried utilities with means of enabling detection by a metal detector to a minimum depth of 3 feet. Tape shall be APWA color coded (ANSI Z535.1) and continuously imprinted with warning and identification markings in bold black letters to read "CAUTION - BURIED (utility) LINE BELOW" or approved similar wording. Color and printing shall be permanent, unaffected by moisture or soil and shall be as follows:

Utility	Color
Potable Water	Blue

Sanitary Gravity, Force Mains & Drains	Green
Electric	Red
Gas, Oil, Steam	Yellow
Communication, Alarms & Signals	Orange
Reclaimed Water, Irrigation	Purple
Proposed Excavation	White

B. Tape shall be by Blackburn Manufacturing, Pollardwater, or Reef Industries Inc.

PART 3 EXECUTION

3.01 PROJECT SAFETY

A. Contractor is responsible for Project safety.

B. Perform work in conformance with applicable State and Federal safety regulations including, but not limited, to the following:
   1. North Carolina Safety and Health Standards for the Construction Industry (29CFR 1926 Subpart P).
   2. NC OSHA Industry Guide No. 14, Excavations.
   3. NC OSHA Industry Guide No. 20, Crane Safety.

C. Provide barriers, warning lights, and other protective devices at excavations as necessary for safety of workers and the public.

D. Provide sloping of bank, shoring, sheeting, or other means of maintaining the stability of the trench in accordance with the requirements of the Associated Contractor's Manual of Accident Prevention OSHA, Part 1926.P.

3.02 PROTECTION OF UNDERGROUND FACILITIES

A. Provide protection of Underground Facilities in accordance with paragraph 5.05 of the General Conditions.

B. A change in conditions may be considered due to the location of the existing facilities as allowed in the General Conditions paragraph 5.05.F. This does not include the cost for repair of damaged facilities not properly located in advance of construction.

C. Separation distances shall be in accordance with utilities requirements.

3.03 CONSTRUCTION STAKING

A. Provide construction staking as indicated in paragraph 4.03 of the General Conditions. Engineer will only provide key reference points and benchmarks.

3.04 LOCATION OF INSTALLED UTILITIES

A. Provide location for contract installed utilities as requested by third parties proposing to dig in the contract area until the date that the entire contract is recommended for final payment by Engineer to Owner.

3.05 WATER CONTROL

A. Prevent surface water from entering the trench.

B. When trench bottom is below the existing ground water table, install a dewatering system to maintain water table 1 foot below trench bottom. Provide a man experienced in dewatering work at the job site.

C. Maintain dewatering until backfilling has proceeded above the existing ground water level.

D. Dispose of water from dewatering operations in accordance with the North Carolina Sedimentation Pollution Control Act.

3.06 USE OF EXPLOSIVES

A. Explosives may not be used on the Project.

3.07 EXCAVATING

A. Excavation shall be by open cut, unless otherwise indicated on the Drawings or specified herein. Short sections of trench may be tunneled or direct bored with the approval of the Engineer.

B. Stockpile excavated material in such a manner that it will not obstruct the flow of runoff, streams, endanger Work, impair the use or appearance of existing facilities, or be detrimental to the completed Work.

C. Segregate excavated material so as to maintain material suitable for backfill separate from material that is unsuitable.

D. Trench dimensions at the pipe embedment and foundation zone unless noted otherwise shall be as follows:
   1. Minimum width: Pipe outside diameter plus 18 inches.
   2. Maximum width: Pipe outside diameter plus 24 inches.
   3. Sides shall be vertical to a minimum of one foot above the top of pipe.

E. Shape trench bedding to provide uniform bearing for the full pipe length. Bottom shall be free of protrusions that could cause point loading on pipe. Provide bell holes as required for properly making pipe joint.

F. Do not over excavate. Excavation below grade without approval of Engineer shall be backfilled with Class I material at no additional cost.

G. Undercut soils that become unsatisfactory by construction activity or by being left exposed to the weather and backfill with Class I material at no additional cost.

H. Remove shoring, bracing, and sheeting, unless otherwise noted, as the trench is backfilled. Engineer shall have the authority to require that the sheeting be left in place.

I. Excavation of trench shall not advance more than 200 feet ahead of the installation. In no case should the excavation extend beyond that which can be backfilled by the end of the workday.

J. Correct unstable soil conditions encountered at trench foundation by:
   1. Excavate below grade as approved by Engineer and backfill with Class I material or approved substitute material at unit price bid or the cost to be included in pipe unit bid price as indicated in Section, Unit Prices.

K. Rock and Hard Material

1. Excavate rock and hard material to a minimum depth of 4 inches below the pipe for pipes smaller than 30 inches and 6 inches for pipes 30 inches and larger.

L. Pressure Lines:
   1. Provide a minimum 3 feet of cover, unless indicated otherwise on the Drawings.
   2. Excavate trenches to provide vertical curve chords that will not exceed the pipe manufacturer's recommended joint deflection.
   3. Provide concrete thrust blocks having a compressive strength of 3,000 psi at 28 days at change in horizontal and vertical direction and reduction in the pipe size, unless other restraint systems are indicated on the Drawings. Cut trench sides vertical and square to receive concrete. Provide bearing area against trench wall as indicated on the Drawings.

M. Utility Structures: Provide a minimum of 12 inches below subgrade and backfill with Class I compacted to 95 percent maximum density. If the soil conditions are found to be unsuitable for structural stability of the structure, Engineer may require additional depth of Class I material.

3.08 BACKFILLING

A. Weather Limitations: Proceed with backfill operations based on the following weather conditions:
   1. Temperature must be above freezing and rising.
   2. In windy, hot, or arid conditions with a high rate of evaporation add moisture to the material to maintain the optimum moisture content.
   3. Do not proceed in rain or on saturated subgrade.
   4. Do not place material on surfaces that are muddy, frozen, or contain frost.

B. General
   1. Maintain backfill operation within 200 feet from pipe laying operation.
   2. Backfill trench to existing ground surface with select excavated material at the specified compaction.
   3. If excavated material is unsuitable to obtain specified compaction, provide suitable off-site borrow material for backfill.
   4. Re-excavate trenches improperly compacted. Backfill and compact as specified.
   5. Provide appropriate tamping equipment, and water to obtain proper moisture content, to achieve specified compaction of backfill.
   6. Conduct operation of heavy equipment above pipe installation as to prevent damage to pipe.
   7. Install warning / identification tape over utilities. Bury tape one foot below finished grade above the utility. -
   8. Install tracer wire for non-metallic pipe. Bury tracer wire with pipe. Wire shall be looped into valve boxes to allow access for direct contact location.

C. Backfill in pipe embedment zone (bedding, haunching, and initial backfill).
   1. General:
      a. Backfill with material as specified below. Material shall be free from objects larger than 2 inches.
      b. Where rock and hard material has been excavated below pipe bottom, backfill and compact bedding with Class I material. Class II or III material may be used for bedding with Engineer's approval.
      c. Place backfill material to assure placement of material under pipe haunches.

d. Take care during placement and compacting of material to avoid movement of pipe.

2. Place backfill in bedding and haunching zones in 6 inch maximum lifts and compact to 90 percent density. Place initial backfill in one lift do not compact. Provide backfill material in pipe embedment zone as specified below.
   a. Pressure Lines (Flexible and Rigid Pipe)
      1) Excavation in Class I, Class II, and Class III soils suitable for bedding, the bedding surface shall provide a firm foundation of uniform density. Backfill with select excavated material.
      2) Excavation in Class IV or Class V, running water, and other unstable soil conditions, excavate a minimum of 4 inches below pipe bottom and provide Class I material for bedding and haunch zone. Backfill with Class I, II, or III material in initial backfill.

D. Final Backfill
   1. Backfill with materials free of stones and free of debris larger than 6 inches in dimension. Place backfill in lifts not exceeding the thickness and compacted to the minimum density specified below.
   2. Trench backfilled with noncohesive materials may be compacted with water flooding; except under roadways, shoulders of roadways, and other areas subject to vehicular movement, provided the method of compaction is approved by the Engineer and provides the degree of compaction required.
   3. Lifts and density:
      a. Undeveloped areas (i.e., forests, fields, and, croplands): Trench may be filled with bulldozer blade provided material fall will not damage pipe. Mound soil over the trench area sufficiently to settle level over time. Degree of compaction shall be 85 percent.
      b. Lawns: Backfill in 12-inch lifts and compact to 90 percent. Top 12 inches shall be free of material with a dimension over 2 inches.
      c. Roads (including Rights-of-way), drives, parking areas (including areas within 20 feet), and adjacent to existing utilities: Backfill in 6 inch lifts compact to 95 percent.
      d. Within 20 feet of foundations: Backfill in 6-inch lifts compacted to 95 percent.

E. Utility Structures: Bring backfill to grade in even lifts on all sides. Lift depths and compaction densities shall be as specified according to area of installation for pipe above. Backfill against cast-in-place concrete structure only after concrete has attained the specified 28-day compressive strength.

3.09 SOIL TESTING

A. Compaction tests may be made at the option of Engineer. An independent testing laboratory will perform tests. Owner will pay for cost of the initial tests.

B. For each test that fails the compaction requirements, the testing firm at the direction of the Engineer shall make two additional tests. Contractor shall pay cost of additional tests made because of failure of compaction test.

C. Correct deficiencies in compaction.

3.10 PAVEMENT PATCHING

A. Repair damaged pavement structure.

B. Cut existing pavement for utility installation in straight lines generally parallel to the utility. Properly dispose of removed pavement structure.

C. Extend pavement patch 1 foot beyond each side of trench on firm subgrade. Slope new surface to drain.

D. Asphalt Pavements: Replace asphalt pavement with a pavement structure no less than as detailed on the Drawings. For roadways under NC Division of Highways jurisdiction, pavement shall be replaced in accordance with the requirements of the encroachment agreement.

E. Concrete Pavements: Replace concrete pavement with pavement structure equal to existing but no less than as detailed as Drawings. Concrete shall be minimum 3,000 psi. When existing concrete joint is within 5 feet of trench remove existing concrete to joint. Provide expansion joint at edge of existing concrete. Surface treatment shall match existing.

F. Curbs, Gutters, and Sidewalks: Replace curbs and gutters, and sidewalks removed or damaged with similar sections to match the existing. Remove to nearest existing joint.

G. Approval of Other Authorities: Pavements under the jurisdiction of the NC Division of Highways shall be subject to the approval of a representative of that Division.

H. Raise existing and new manholes and valve boxes to finished pavement grade. Excavate around top of existing manhole and valve box as necessary. Remove existing top ring, and install new grade ring(s) as necessary. Install existing cover. Raise existing valve box. Provide concrete collar around manhole ring and valve box.

I. Pavement patching shall include the cost to adjust existing and new manhole and valve boxes to finished pavement elevations.

3.11 GRADING AND CLEAN-UP:

A. Provide for testing and clean up as soon as practicable, so these operations do not lag far behind the pipe installation. Perform preliminary clean up and grading as soon as backfill is complete.

B. Provide positive drainage of finished grade and drain away from structures. Finished grade shall be reasonably smooth, compacted, free from irregular surface changes and comparable to the adjacent existing ground surface.

C. Seed disturbed areas in accordance with Section, Lawns and Grasses.

D. Upon completion of backfilling, remove and properly dispose of excess material and waste.

END OF SECTION

SECTION 31 25 00

EROSION AND SEDIMENTATION CONTROL

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Work shall include, but not be limited to, the following:
   1. Erosion control at project site.
   2. Erosion control at borrows and disposal areas as required by Contractor. Cost shall include erosion control permits as necessary for borrow and disposal areas.
   3. Removal of surface debris.
   4. Temporary and permanent ground cover.
   5. Maintain and remove erosion control devices.
   6. Self-Inspection and Monitoring

1.02 RELATED SECTIONS

A. The following Sections have work that is directly related to this Section. This does not relieve the Contractor of his responsibility of proper coordination of all the work:
   1. Section 31 25 00, Erosion Control
   2. Section 32 92 00, Lawns and Grasses

1.03 REFERENCED STANDARDS

A. “Erosion and Sediment Control Planning and Design Manual,” issued by the N. C. Sedimentation Control Commission.

1.04 QUALITY ASSURANCE

A. Conform to rules and regulations of the Erosion Control Laws of the State of North Carolina, specifically the Sedimentation Pollution Control Act of 1973 (G.S. 113A) as amended, and the local jurisdiction where the project is located.

B. Post a copy of the approved erosion control permit, furnished by Owner, at the site prior to starting work. Maintain a copy of the approved erosion control plan at the site.

C. Provide permanent ground cover as soon as possible, and no later than 15 working days after completion of work in a specific area.

1.05 WARRANTY

A. Contractor is liable for damages to public and private property and fines as may be placed on the Project by the governing agencies due to failure to provide adequate erosion control devices.

1.06 SUBMITTALS

A. Submit the following in accordance with Section, Submittal Procedures:
   1. Self-Inspection Reports

PART 2 PRODUCTS

2.01 MATERIALS

A. Matting / Erosion Control Fabric (ECF): Matting and ECF shall be heavy jute mesh over mulch held in place by staples. Commercially available ECFs may be used upon approval of the engineer. Matting shall not incorporate plastic mesh and/or plastic twine when utilized along stream banks or within wetlands. Approval of fabrics will require manufacturer's design data regarding velocity, ditch slopes, method of installation, decay cycle, repair techniques, and grass growth enhancement characteristics.
   1. Matting shall meet the requirements of section 1060-8 of the NCDOT Standard Specifications or shall meet specifications provided elsewhere in this contract.

B. Wire Staples: 16 gauge steel wire, with minimum of 3" top and 4" long legs.

C. Gravel for Stone Filters: #57 crushed stone.

D. Filter Fabric: 7-1/2 oz. burlap fabric or other silt filtering fabric.

E. Wattle shall meet the following specifications: 100% Curled Wood (Excelsior) Fibers

Minimum Diameter	12 in.
Minimum Density	2.5 lb/cft +/- 10%
Net Material	Synthetic
Net Openings	1 in. x 1 in.
Net Configuration	Totally Encased
Minimum Weight	20 lb. +/- 10% per 10 ft. length

   1. Anchors: Stakes shall be used as anchors. Provide hardwood stakes a minimum of 2-ft long with a 2 in. x 2 in. nominal square cross section. One end of the stake must be sharpened or beveled to facilitate driving down into the underlying soil.
   2. Provide staples made of 0.125" diameter new steel wire formed into a U shape not less than 12" in length with a throat of 1" in width.

PART 3 EXECUTION

3.01 INSTALL EROSION CONTROL DEVICES

A. Install erosion control devices, which shall be in place and operational prior to other land disturbing activity.

B. After installing erosion control devices as indicated on the Drawings, verify that reasonable measures have been taken to prevent the sedimentation of nearby watercourses, existing and new facilities, and adjacent property.

C. Should Contractor believe that additional measures are necessary to adequately prevent erosion, immediately notify Engineer. If rain is predicted before the Engineer can be notified, take measures as necessary to prevent siltation of nearby water courses and work will be paid for as provided in the General Conditions.

D. After installing erosion control devices, request an inspection by the local agency having jurisdiction and the Engineer.

E. Incorporate permanent erosion control work into the project at the earliest practicable time. Coordinate temporary erosion control measures with permanent erosion control measures and other work on the project to assure effective and continuous erosion control throughout the construction and post construction period.

F. Maintain erosion control devices during construction until the disturbed areas are stabilized and the agency having jurisdiction and the Engineer have approved the removal of the erosion control devices.

3.02 BORROW AND DISPOSAL AREAS:

A. Obtain and pay for erosion control permit for borrow and disposal areas as required by Contractor.

B. Install and maintain erosion control devices in accordance with Contractor's approved plan.

3.03 MAINTENANCE

A. Inspect erosion control devices after each rainfall. Make required repairs immediately. Remove sediment deposits when deposits reach approximately one-half of the capacity of the erosion control device.

B. Respread accumulated sediments on the project site in a manner that will not adversely affect erosion control facilities and permanent ground cover.

C. Silt Fence: Should the filter fabric decompose or become ineffective before approval of its removal by the Engineer, replace fabric immediately at no additional cost to the Owner.

D. Temporary Construction Entrance: Maintain entrance in a condition that will prevent tracking or flow of mud onto public rights-of-way. This may require periodic top dressing with 2 inches of stone, as conditions require, at no additional cost to the Owner.

3.04 SEEDING

A. Disturbed areas not covered by new construction shall be seeded.

B. Provide temporary and permanent seeding in accordance with Section, Lawns and Grasses.

3.05 STABILIZATION AND CLEAN-UP

A. Remove erosion control devices upon the approval of the permanent stabilization of this site by the agency having jurisdiction of the area and the Engineer. Dress sediment deposits remaining in place after the erosion control devices are removed to conform to the existing grade, prepared and seeded. Include cost of removal and cleanup in the cost of the installation of the device.

3.06 SELF INSPECTION AND MONITORING

A. Provide self-inspection and reporting as required by the Sedimentation Pollution Control Act for the duration of the project. These inspections will be performed to ensure that the approved sedimentation and erosion control measures on the Drawings are installed, maintained, and working adequately.
   1. The inspections need to be conducted after each phase of the project, and continue until permanent ground cover is established.
   2. The self-inspection forms and information regarding this program are available at the following website: Form Rev 07012020

a. https://www.deq.nc.gov/energy-mineral-and-land-resources/land-quality/combined-construction-stormwater-monitoring-form/demlr-monitoring-form-rev-07012020/download

3. Documentation of inspections shall be recorded on a single copy of the approved erosion and sedimentation control drawings. These Drawings and inspection reports shall be made available at the project site.

B. Provide weekly self-monitoring in accordance with the NPDES Stormwater permit for all construction activities.

END OF SECTION

SECTION 32 12 12

PAVEMENT AND APPURTENANCES

PART 1 GENERAL

1.01 SCOPE

A. Provide pavement, curb and gutter, and sidewalk sections as indicated on the Drawings and specified herein. Construction shall conform with the lines, grades, thickness, and typical cross-section indicated on the Drawings.

B. Provide for the milling of the existing pavement.

1.02 RELATED SECTIONS

A. The following Sections have work that is directly related to this Section. This does not relieve the Contractor of his responsibility of proper coordination of all the work:
   1. Section 31 23 33 Trenching and Backfilling for Utilities

1.03 REFERENCED STANDARDS

A. The latest revision, at the time of bidding, of the publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.
   1. N.C. Department of Transportation - Specifications for Roads and Structures (NCDOT). 2002

B. Paragraphs in the NCDOT standard regarding measurement and payment do not apply to this Project.

1.04 SUBMITTALS

A. Submit the following in accordance with Section 01 33 00, Submittal Procedures:
   1. Certificates of Compliance: Certificates shall attest that supplied products conform to the referenced standard and this specification, that all tests set forth in each applicable referenced publication have been performed, and that all test requirements have been met. Submit for each of the following materials:
      a. Asphalt Concrete
      b. Aggregate Base Course
      c. Pavement Marking Material

1.05 PROTECTION OF EXISTING PAVEMENT, CURB AND GUTTER, AND SIDEWALK

A. Existing pavement, curb and gutter, and sidewalks at the site are in good condition. Contractor, Owner, and Engineer shall inspect the entire site prior to the start of construction and mark existing damaged areas and note areas on Contractor's plan set to be used for the Record Drawings.

B. Protect existing pavement, curb and gutter, and sidewalks during construction.

C. Remove areas of existing curb and gutter, and sidewalks damaged during construction. Removal shall include to the nearest existing joint. Replace damaged areas with new curb and gutter, and sidewalks to match the existing section.

D. Remove areas of existing pavement damaged during construction. New pavement patch shall consist of re-stabilizing the subgrade, and providing 8 inches of ABC and 2 inches of SF9.5A asphalt to match existing pavement surface.

E. Repair damage to existing pavement, curb and gutter, and sidewalks.

PART 2 PRODUCTS

2.01 MATERIALS AND MIXES

A. Asphalt Concrete Base Course - Type B-25.0B: Conforming to materials and compositions required in NCDOT Section 610, Asphalt Concrete Plant Mix Pavements.

B. Tack Coat: Conforming to materials and compositions required in NCDOT Section 605, Asphalt Tack Coat.

C. Asphalt Concrete Surface Course - Type SF9.5A: Conforming to materials and composition required in NCDOT Section 610, Asphalt Concrete Plant Mix Pavements.

D. Concrete for Curb and Gutter, and Sidewalks: Conforming to materials and composition required in NCDOT Section 846, Concrete Curb, Curb and Gutter, Concrete Gutter, Shoulder Berm Gutter, Concrete Expressway Gutter, Concrete Valley Gutter and Concrete Flumes, and Section 848, Concrete Sidewalks and Driveways and Wheelchair Ramps.

E. Base Course: Aggregate base course shall comply with requirements of NCDOT Section 520, Aggregate Base Course.

F. Pavement Markings and Symbols: Conforming to materials and composition required in NCDOT Section 1205, Pavement Marking General Requirements.

G. Brick pavers: Type ASTM C62 grade SW, modular size 2-1/4-inch high, 4–inch wide, and 8-inch long.

PART 3 EXECUTION

3.01 PREPARATION OF SUBGRADE

A. Refer to applicable portions of Section 31 11 00, Earthwork.

B. Compaction shall be to at least 95 percent maximum density Standard Proctor Method.

C. Remove unsuitable material to a depth of one foot and replace with an approved material. Loosen exceptionally hard spots and re-compact. Finish subgrade to provide uniform bearing surface.

D. Maintain subgrade in satisfactory condition and properly drain until surface courses are placed.

E. Preparation, shaping, and compaction shall be in accordance with NCDOT Section 500, Fine Grading Subgrade, Shoulders, and Ditches.

3.02 AGGREGATE BASE COURSE

A. This applies to both the aggregate base course as indicated on the Drawings for paved and unpaved roads.

B. The stone base shall be constructed in accordance with the applicable paragraphs of NCDOT Section 520.

C. Compacted base shall be of the thickness indicated on the Drawings.

3.03 ASPHALT CONCRETE BASE COURSE

A. Spreading, compaction, and finishing shall comply with the requirements of NCDOT Section 610, Asphalt Concrete Plant Mix Pavements.

B. Compacted thickness shall be no less than the thickness indicated on the Drawings.

3.04 ASPHALT CONCRETE SURFACE COURSE

A. Spreading, compaction, and finishing shall comply with the requirements of NCDOT Section 610 Asphalt Concrete Plant Mix Pavements.

B. Compacted thickness shall be as indicated on the drawings.

3.05 TACK COAT

A. Application rates, method of application, and curing shall be in accordance with the requirements of NCDOT Section 605.

3.06 CONCRETE CURB & GUTTER

A. Provide concrete curb and gutter where indicated on the Drawings. Curb and Gutter shall conform to the section indicated on the Drawings.

B. Construct Curb and Gutter in accordance with NCDOT Section 846.

3.07 PAVEMENT MARKINGS AND SYMBOLS

A. Mark parking spaces in paved areas with 4 inch white paint stripe the length of the parking space.

B. Stripe roads maintained by the NCDOT or the local municipality in accordance with the agency requirements.

C. Provide painted pavement symbols as indicated on the Drawings.

END OF SECTION

SECTION 32 31 26

CHAIN LINK FENCING

PART 1 GENERAL

1.01 SCOPE

A. Provide chain link fencing where indicated on the Drawings and specified herein.

B. Work shall include, but not be limited to, the following major items and necessary accessories for a complete and operational system:
   1. Clearing as necessary for installation of fence.
   2. Fence post, frame, and concrete foundation.
   3. Chain link fabric and barbed wire.
   4. Gates.

1.02 SYSTEM DESCRIPTION

A. Fencing Location
   1. Function: Security at well sites.
   2. Fence Height: 6 feet
   3. Provide posts, bottom intermediate and top rails as indicated. Provide corner and brace assemblies.
   4. Provide fabric gauges as indicated and install fabric on outside of fence and anchor to framework such that fabric remains in tension after pulling force is released.

1.03 SUBMITTALS

A. Submit the following in accordance with Section 01 33 00, Submittal Procedures:
   1. Catalog Data: Submit manufacturer's standard drawings or catalog cuts for the following. Equipment to be furnished for the Project shall be clearly indicated including all options to be provided.
      a. Individual components of the fencing system.
   2. Shop Drawings: Submit Project specific shop drawings for the following:
      a. Layout drawing showing spacing of posts and location of gate, corner, end, and pull posts.
   3. Manufacturer's Installation Procedures.

1.04 QUALITY ASSURANCE

A. Installer Qualifications: Engage an installer who has at least three years’ experience and has completed at least five chain link fence projects with the same material and of similar scope to that indicated for this project with a successful construction record of in-service performance.

PART 2 PRODUCTS

2.01 FABRIC

A. Selvage: Fabric shall be knuckled at both selvages. Fabric shall be knuckled at one selvage and twisted and barbed at the other selvage. Fabric shall be twisted and barbed at both selvages. Both selvages of meshes less than 2 inches shall be knuckled. Bottom tension wire shall be 7 gauge and shall terminate at posts.

B. Galvanized Steel Chain-Link Fence Fabric: Fabricated in one-piece widths for fencing 12 feet and less in height to comply with Chain Link Fence Manufactures Institute (CLFMI) “Product Manual” and with requirements indicated below:
   1. Mesh and Wire Size: 2-inch mesh, 0.148-inch diameter (9 gage).
   2. Mesh and Wire Size: 2-inch mesh, 0.192-inch diameter (6gage).
   3. Coating: ASTM A 392-74, Class 2, galvanized.

C. Safety Netting: Black all weather boundary netting, 1- inch mesh 320 lb. Breaking strength.

2.02 FRAMING

A. Round member sizes are given in actual outside diameter (OD) to the nearest thousandth of inches. Round fence posts are often referred to in ASTM standard specifications by Nominal pipe sizes (NPS) or the equivalent trade sized inches. The following indicates these equivalents all measured in inches:
   1. NPS Trade
   2. Size
   3. ==========
   4. 1 1/4 1 5/8
   5. 1 1/2 2
   6. 2 2 1/2
   7. 2 1/2 3
   8. 3 1/2 4

B. Type I Round Posts: Standard weight (schedule 40) galvanized-steel pipe conforming to ASTMF 1083, according to heavy industrial requirements of ASTM F 669. Group IA, with minimum yield strength of 25,000 psi, not less than 1.8 oz. of zinc per square foot. Type coating inside and outside according to ASTM F 1234, as determined by ASTM A 90, and weights per foot as follows:
   1. Weight NPS
   2. (lb/ft) Size
   3. ==========
   4. 2.27 1-1/4
   5. 2.72 1-1/2
   6. 3.65 2
   7. 5.79 2 1/2
   8. 9.11 3 1/2

C. Top Rail: Manufacturer’s longest lengths (21 feet) with expansion-type coupling, approximately 6 inches long for joining. Provide rail ends of other means for attaching top rail securely to each gate, corner, pull, and end post.
   1. Round Steel: 1.660-inch OD Type.

D. Steel posts for fabric heights up to 6 feet:
   1. Round Line or Intermediate Posts: 2.375-inch OD Type I steel pipe.
   2. Round End, Corner, and Pull Posts: 2.875-inch OD Type I steel pipe.

E. Steel posts for fabric heights over 6 feet:

1. Round Line or Intermediate Posts: 2.375-inch OD Type I steel pipe.
2. Round End, Corner, and Pull Posts: 2.875-inch OD Type I steel pipe.
3. Backstop: 4 inch OD Type I steel pipe (all posts).

F. Swing Gate Posts: Furnish post to support single gate leaf, or one leaf of a double-gate installation, according to ASTM F 900, sized as follows.
   1. Steel posts for fabric height of 8 feet or less and gate leaf width:
      a. Up to and including 4 feet: 2.875-inch OD pipe weighing at least 5.79 lb per feet.
      b. Over 4 to 10 feet: 4.000-inch OD pipe weighing at least 9.11 lb per ft.

2.03 FITTINGS AND ACCESSORIES

A. Material: Comply with ASTM F 626. Galvanized iron or steel to suit manufacturer's standards.
   1. Steel and Iron: Unless specified otherwise, hot-dip galvanize steel or cast-iron fence fittings and accessories with at least 1.2 oz. Zinc per sq. ft. as determined by ASTM A 90.

B. Post and Line Caps: Provide weather-tight closure cap for each post. Provide line post caps with loop to receive top rail.

C. Post Brace Assembly: Manufacturer's standard adjustable brace. Use material specified below for brace, and truss to line posts with 3/8-inch-diameter rod and adjustable tightener. Provide manufacturer's standard galvanized-steel, cast iron or cast-aluminum cap for each end.
   1. Round Steel: 1.6600-inch OD Type I steel pipe.

D. Bottom and Center Rail: (Where indicated on drawings). Same material as top rail unless indicated otherwise. Provide manufacturer's standard galvanized-steel, cast-iron or cast-aluminum cap for each end.

E. Tension or Stretcher Bars: Hot-dip galvanized steel with a minimum length 2 inches less than the full height of fabric, a minimum cross section of 3/16 inch by 3/4, and a minimum of 1.2 oz of zinc coating per sq. ft. Provide one bar for each gate and end post, and two for each corner and pull post, except where fabric is integrally woven into the post.

F. Tension and Brace Bands: 3/4 –inch-wide minimum hot-dip galvanized steel with a minimum of 1.2 oz. of Zinc coating per sq. ft.
   1. Tension Bands: 0.074-inch thick (14 gauge) minimum.
   2. Brace Bands: 0.105 inch thick (gauge) minimum

G. Tension Wire: 0.177-inch-diameter metallic-coated steel marcelled tension wire conforming to ASTM A 824 with finish to match fabric.
   1. Coating Type II zinc in the following class as determined by ASTM A 90.
      a. Class 2, with a minimum coating weight of 1.20 oz. per sq. ft. of uncoated wire surface.

H. Tie Wire: (9-gauge) aluminum wire alloy 1350-H19 or equal.

2.04 BARB WIRE

A. Provide three lines of 4 point pattern barbed wire. Barb wire shall be double strand 12-1/2 gauge twisted wire with 14 gauge, 4 point round aluminum barbs spaced on approximately 5 inch centers conforming to the requirements of ASTM A121. Extension arms to accommodate barbwire shall withstand a 250-pound pulldown load from end of arm and have a 3-inch apron around post. The top most barbed wire shall be approximately 18 inch above the fabric and approximately 18 inch out from fence line. Barbed wire shall be securely fastened in slots by heavy wire pins. Arms having projections to bend down over barbed wire will not be acceptable.

2.05 CONCRETE

A. Concrete: Provide concrete consisting of Portland cement per ASTM C150, aggregates per ASTM C 33, and potable water. Mix materials to obtain concrete with a minimum 28-day compressive strength of 3000 psi. Use at least four sacks of cement per cu. yd., 1-inch maximum size aggregate, 3-inch maximum slump.

B. Package Concrete Mix: Mix dry-packaged normal-weight concrete conforming to ASTM C 387 with clean water to obtain a 2- to 3- slump.

2.06 GATES

A. General: Fabricate perimeter frames of gates from same material and finish as fence framework. Assemble gate frames by welding. Provide horizontal and vertical members to ensure proper gate operation and attachment of fabric, hardware, and accessories. Space frame members a maximum of 8 feet apart unless otherwise indicated.
   1. Fabric: Same as for fence unless otherwise indicated. Secure fabric at vertical edges with tension bars and bands and to top and bottom of frame with tie wires.
   2. Bracing: Install an adjustable truss rod diagonally on gates six foot wide and greater to prevent sagging.

B. Swing Gates: Comply with ASTM F 900.
   1. Framework: Fabricate using 1.660-inch minimum OD Type I steel pipe or 1-inch-square galvanized steel tubing weighing 1.84 lb per sq. ft.
   2. Gate Hardware: Provide galvanized hardware and accessories for each gate according to the following:
      a. Hinges: Size and material to suit gate size, non-lift-off type, offset to permit 180 degree gate opening. Provide 1-1/2 pair of hinges for each leaf over 6-foot nominal height.
      b. Latch: Forked type or plunger-bar type to permit operation from either side of gate, with padlock eye as an integral part of latch.
      c. Keeper: Provide a keeper for vehicle gates that automatically engages gate leaf and holds it in the open position until manually released.
      d. Gate stops: Provide gate stops for double gates consisting of mushroom-type flush plate with anchors, set in concrete, and designed to engage a center drop rod or plunger bar. Include a locking device and padlock eyes as an integral part of the latch, permitting both gate leaves to be locked with a single padlock.

PART 3 EXECUTION

3.01 INSTALLATION

A. General: Install fence to comply with ASTM F 567. Do not begin installation and erection before final grading is completed, unless otherwise permitted.

B. Excavation: Drill or hand-excavate (using post-hole digger) holes for posts to diameter and spacings indicated, in firm, undisturbed or compacted soil.
   1. If not indicated on Drawings, excavate holes for each post to minimum diameter recommended by fence manufacturer, but not less than four times the largest cross section of post.
   2. Unless otherwise indicated, excavate hole depths approximately 3 inches lower than post bottom, with bottom of posts set not less than 36 inches below finish grade surface.

C. Setting Posts: Center and align posts in holes 3 inches above bottom of excavation. Space a maximum of 10 feet o.c., unless otherwise indicated.
   1. Protect portion of posts above ground from concrete splatter. Place concrete around posts and vibrate or tamp for consolidation. Check each post for vertical and hold in position during placement and finishing operations.
      a. Pour concrete footings to a level 2” below finished grade and cover with fresh earth from excavation.
      b. Crown concrete footings at top to shed water.

D. Top Rails: Run rail continuously through line post caps, bending to radius for curved runs and at other posts terminating into rail end attached to posts or post caps fabricated to receive rail. Provide expansion couplings as recommended by fencing manufacturer.

E. Center Rails: Install center rails in one piece between posts and flush with post on fabric side, using rail ends and special offset fittings where indicated.

F. Brace Assemblies: Install braces at end and gateposts and at both sides of corner and pull posts. Locate horizontal braces at midheight of fabric. Install so posts are plumb when diagonal rod is under proper tension.

G. Bottom Tension Wire: Install tension wire within 6 inches of bottom of fabric before stretching fabric and tie to each post with not less than same gage and type of wire. Pull wire taut, without sags. Fasten fabric to tension wire with 0.120-inch-diameter (11-gage) hog rings of same material and finish as fabric wire, spaced a maximum or 24 inches o.c.

H. Fabric: Pull fabric taut and tie to post, rails, and tension wires.

I. Tension or Stretcher Bars: Thread through fabric and secure to end, corner, pull, and Gateposts with tension bands spaced not over 15 inches o.c.

J. Tie Wires: Use wire of proper length to secure fabric firmly to posts and rails. Bend ends of wire to minimize hazard to persons or clothing.
   1. Maximum Spacing: Tie fabric to line posts 12 inches o.c. and to rails and braces 24 inches o.c.

K. Fasteners: Install nuts for tension bands and carriage bolts on the side of the fence opposite the fabric side.

L. Netting Ties: Fasten safety netting to tension cable and fence top rail with cable ties at 12” o.c.

M. Barbed Wire: Install three parallel wires on each extension arm on security side of fence, unless otherwise indicated. Pull wires taut.

N. Gates: Install gates plumb, level and secure for full opening without interference. Install ground set items in concrete for anchorage as recommended by the manufacturer.

END OF SECTION

SECTION 32 92 00

LAWNS AND GRASSES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Work shall include, but not be limited to, the following:
   1. Surface preparation of subsoil.
   2. Placing topsoil.
   3. Addition of lime and fertilizer.
   4. Seeding.
   5. Maintenance to produce a permanent stand of grass.

1.02 REFERENCES

A. N.C. Department of Agriculture - NCDA

B. U.S. Department of Agriculture - USDA

1.03 PERFORMANCE REQUIREMENT

A. Grassed area shall be considered established when it presents a green appearance from eye level 50 feet away and the grass is vigorous and growing well in each square foot of seeded area. It is not required that the seeded area be thick and heavy as an old established lawn.

B. Should the permanent seed not germinate and produce a strand of grass, reseed affected areas until a permanent stand is established.

1.04 SUBMITTALS

A. Not less than 6 weeks prior to seeding, obtain representative soil samples from areas to be seeded and deliver the properly packaged samples with an information sheet for each sample properly filled out to the Soils Division of the NC Department of Agriculture or a private laboratory. Based on the test results, submit to the Engineer a recommendation as to the quantity and type of lime, fertilizer and seed for the area covered by the test.

1.05 QUALITY ASSURANCE

A. Quality of fertilizer, lime, and seed, and operations in connection with the furnishing of this material, shall comply with the requirements of the N.C. Fertilizer, Lime and Seed Law; and with the requirements of the rules and, regulations adopted by the NC Department of Agriculture in accordance with the provisions of the said law.

B. Seed containers shall bear an official "Certified Seed" label as inspected by the N.C. Crop Improvement Association.

C. Packages for soil conditioners and fertilizer shall bear manufacturer's guaranteed analysis.

D. Do not apply lime, fertilizer or seed in strong wind, when the soil is extremely wet, or otherwise unworkable. No rolling shall be done if precipitation after seeding would make the operation detrimental to the seed bed.

1.06 DELIVERY, STORAGE, AND PROTECTION

A. Deliver grass seed mixture in sealed containers showing percentage of seed mix, year of production, net production, net weight, date of packaging, and location of packaging.

B. Deliver fertilizer in waterproof bags showing weight, chemical analysis, and name of manufacturer.

1.07 MAINTENANCE SERVICE

A. Maintain seeded areas until grass is well established and exhibits a vigorous growing condition for a minimum of two cuttings. Mow grass at regular intervals to a maximum height of 3 inches. Hand clip where necessary.

B. Control growth of weeds. Apply herbicides in accordance with manufacturer's instructions.

C. Water areas seeded between May 1 and July 15 at such intervals as to maintain the seeded area in a moist condition until the grass is established and accepted by the Engineer. Provide equipment to transport and distribute the water to the seeded areas. Areas seeded between September 1 and November 1 need not be irrigated beyond the initial watering specified above except that the Contractor may apply water at his own discretion.

PART 2 PRODUCTS

2.01 MATERIALS

A. Topsoil: Fertile, agricultural soil, typical for locality, capable of sustaining vigorous plant growth, taken from drained site; free of subsoil, clay or impurities, plants, weeds, and roots; pH value of minimum 5.4 and maximum of 7.0.

B. Lime: Ground Dolomitic agricultural limestone, not less than 85 percent total carbonates, ground so that 50 percent passes 100 mesh sieve and 90 percent passes 30 mesh sieve. Coarser material will be acceptable, provided the specified rates of application are increased proportionately on the basis of quantities passing No. 100 mesh sieve.

C. Fertilizer: Mixed, commercial, fertilizer containing 10-10-10 percentages of available nitrogen, phosphoric acid, and potash respectively, plus superphosphate with 20 percent P2O5 content. Fertilizer shall be dry, in granular (pellet) form, shall be delivered to the site in the manufacturer's original bag or container which shall be plainly marked as to formula.

D. Seed: Fresh seed guaranteed 95 percent pure with a minimum germination rate of 85 percent within one year of tests. Provide the following seed mixtures with lime and fertilizer in disturbed areas including NCDOT Rights-of-Way:

1. Permanent Seeding - NCDOT rights-of-way

Planting Dates	Grass Type	Pounds / Acre
Year Round	Pensacola Bahia	50
	KY 431 Tall Fescue	50
	Centipede	5

Lime		4,000
Fertilizer	10-20-20	500
Mulch	Straw	4,000

On 2:1 slopes delete Centipede and add 25 pounds / acre of Sericea Lespedeza.

2. Temporary Seeding

Planting Dates	Grass Type	Pounds / Acre
Jan. 1 - May 1	Rye (Grain)	120
	Korean Lespedeza	50
May 1 - Aug. 15	German Millet	40
	or	
	Sudangrass	50
Aug.15 - Dec. 15	Rye (Grain)	120
Lime		3,000
Fertilizer	10-10-10	800
Mulch	Straw	4,000

3. Permanent Seeding

Planting Dates	Grass Type	Pounds / Acre
Aug. 25 - Sep. 15	Tall Fescue	80
&	Kobe Lespedeza	40
Feb. 1 - Mar. 21		
Lime		4,000
Fertilizer	10-10-10	1,000
Mulch	Straw	4,000

4. Permanent Seeding - Wetland/Riparian Buffers

Planting Dates	Planting Dates	Grass Type	Pounds / Acre
May 1 - Sept. 1		Korean Lespedeza	10
Dec. 1 - May 1	Sept. 1 - Nov. 1	Soft Rush	2.5
Dec. 1 - May 1	Sept. 1 - Nov. 1	Shallow Sedge	2.5
Dec. 1 - May 1	Sept. 1 - Nov. 1	Fox Sedge	2.5
May 1 - April 1		Deertongue	6
Application of lime & fertilizer not permitted in wetlands/riparian buffers			

E. Matting / Erosion Control Fabric (ECF): Matting and ECF shall be heavy jute mesh over mulch held in place by staples. Commercially available ECFs may be used upon approval of the engineer. Approval of fabrics will require manufacturer's design data regarding velocity, ditch slopes, method of installation, decay cycle, repair techniques, and grass growth enhancement characteristics.

F. Wire Staples: 16 gauge steel wire, with minimum of 3" top and 4" long legs.

G. Mulch: Threshed straw of oats, wheat, or rye; free from seed of obnoxious weeds; or clean salt hay. Straw which is fresh and excessively brittle or straw which is in such an advanced stage of decomposition as to smother or retard growth of grass will not be acceptable.

H. Water: Water shall be free from substances harmful to growth of grass.

PART 3 EXECUTION

3.01 PREPARATION OF SUBSOIL

A. Complete operations in the area to be seeded and prepare subsoil to eliminate uneven areas and low spots. Bring surface to the approximate design contours.

B. Scarify subsoil to a depth of 3 inches. Remove weeds, roots, stones and foreign materials 1-1/2 inches in diameter and larger.

3.02 PLACING TOPSOIL

A. Place topsoil during dry weather and on dry unfrozen subsoil.

B. Spread topsoil to a minimum depth of 4 inches. Remove vegetable matter and foreign non-organic material from topsoil while spreading. Grade surface to provide positive drainage and prevent water ponding. Lightly compact topsoil with at least one pass of a cultipacker or similar equipment

C. Maintain the finished surfaces by protecting, and replacing topsoil and subsoil as necessary until the area is accepted under the contract.

3.03 APPLICATION OF LIME

A. Liming shall be done immediately after grading has reached the fine grading stage, even though actual seeding may not be done until several months later.

B. Spread lime evenly by means of a mechanical distributor.

C. When lime is distributed by commercial liming dealers, sales slips showing the tonnage delivered shall be filed with the Engineer and shall show the full tonnage required for the acres treated.

D. Incorporate lime in the top 2 to 3 inches of soil by harrowing, disking, or other approved means.

3.04 APPLICATION OF FERTILIZER

A. Spread fertilizer not more than 2 weeks in advance of seeding.

B. To verify application rate, determine acreage to be fertilized and provide Engineer with total weight of fertilizer applied to the area.

C. Provide mechanical spreader for even distribution and spread half of the rate in one direction, and the other half at right angles to the first. Mix thoroughly into upper 2 to 3 inches of soil by disking, harrowing or other approved methods.

3.05 SEEDING

A. Accomplish seeding by means of an approved power-drawn seed drill, combination corrugated roller-seeder, approved hand operated mechanical seeder, or other approved methods to provide even distribution of seed.

B. Do not seed when ground is excessively wet or excessively dry. After seeding, roll area with a roller, not less than 18 inches in diameter and weighing not more than 210 pounds per foot of width. Upon completion of rolling, water area with a fine spray.

C. Immediately following seeding apply mulch or matting. Do not seed areas in excess of that which can be mulched on same day.

D. Apply water with a fine spray immediately after each area has been mulched. Saturate to 4 inches of soil depth

3.06 MULCHING AND MATTING

A. Apply mulch or matting as required to retain soil and grass, but no less than the following:
   1. Slopes from 0 to 20 percent by spreading a light cover of mulch over seeded area at the rate of not less than 85 lbs. per 1000 sq. ft.
   2. Slopes greater than 20 percent mulch with matting. Pin matting to the ground with wire staples at 5 foot intervals, immediately after seeding.
   3. Use tack to prevent disruption of mulch.

B. For tack use an asphalt tie-down of emulsified asphalt grade AE-3 or cut-back asphalt grade RC-2 or other approved equal. The application rate shall be 0.10 gal/sy (11 gal / 1000 sq ft). An approved jute mesh or net may be used in lieu of tacking straw mulch.

C. Other types of mulch and anchoring methods may be used upon approval by the Engineer.

3.07 PROTECTION

A. Protect seeded areas from damage by barricades, signs, and other appropriate means. Maintain and protect slopes from weather damage.

END OF SECTION

SECTION 33 05 07.13

HORIZONTAL DIRECTIONAL DRILLING

FOR PIPE INSTALLATION

PART 1 GENERAL

2.01 SCOPE

A. Provide complete installation of high density polyethylene (HDPE) pressure pipe at stream crossings by horizontal directional drilling (HDD) as indicated on the drawings.

B. Work shall include, but not be limited, to the following:
   1. General site and access preparation necessary for construction operations.
   2. Assembly of HDPE pipe.
   3. Hydrostatic testing of the HDPE pipe prior to installation (Contractor's option).
   4. Erection of drilling equipment.
   5. Drilling of a small diameter pilot hole.
   6. Reaming the pilot hole as specified herein to a diameter suitable for installation of the HDPE pipe.
   7. Pulling the assembled HDPE pipe through the reamed hole along with the detector wire.
   8. Hydrostatic testing of HDPE pipe after installation.
   9. Cleanup and final restoration of work area.

2.02 RELATED SECTIONS

A. The following Sections have work that is directly related to this Section. This does not relieve the Contractor of his responsibility of proper coordination of the work:
   Section 31 11 00 Clearing and Grubbing
   Section 31 23 33 Trenching and Backfilling for Utilities
   Section 33 14 43 Water Distribution System

2.03 REFERENCES

A. Publications are referred to in the text by basic designation only.
   1. American Society for Testing and Materials (ASTM)
      a. Polyethylene Plastics Pipe and Fittings Materials
   2. American Water Works Association (AWWA)
      a. Hypochlorites 92
      b. Liquid Chlorine 92
      c. Cement-Mortar Lining for Ductile-Iron Pipe and Fittings for Water 95
      d. Polyethylene Encasement for Ductile-Iron Piping for Water and Other Liquids
      e. Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings 93
      f. Thickness Design of Ductile Iron Pipe 96
      g. Ductile-Iron Pipe, Centrifugally Cast, for Water
      h. Ductile-Iron Compact Fittings, 3-inch through 24-inch and 54-inch through 64-inch, for Water Service 96
      i. Standard for Installation of Ductile Iron Water Mains and Their Appurtenances 87

j. Disinfecting Water Mains 92
k. Polyethylene (PE) pressure Pipe and Fittings, 4 - 63 inch for Water Distribution and Transmission 99

2.04 SUBMITTALS

A. Submit the following in accordance with Section 01 33 00, Submittal Procedures:
1. Affidavit of Compliance: Affidavit shall attest that supplied products conform to the referenced standard and this specification and that all tests set forth in each applicable referenced publication have been performed and that all test requirements have been met. Submit for each of the following materials:
a. HDPE Pipe.
2. Catalog Data: Submit manufacturer's standard drawings or catalog cuts for the following. Clearly indicate equipment to be furnished for the Project including options to be provided.
a. HDPE Pipe.
3. Test Reports: Submit for the following:
a. Field test including calibration report and pressure testing.
4. Description of the arrangement of directional drilling including method of monitoring and controlling line and grade, schedule, and procedure of installation.
5. Provide pipe manufacturer’s recommended pull-back pressure to be utilized during installation.
6. Log sheets as required herein.
7. Provide certified as-built drawing (profile) upon completion of drilling.

2.05 QUALITY ASSURANCE

A. Pipe manufacturer shall have an established quality control program responsible for inspecting and testing incoming and outgoing material.

B. Manufacturer shall maintain permanent Quality Control (QC) and Quality Assurance records.

C. Contractor shall employee personal that have a minimum of ten (10) similar installations of HDPE by horizontal directional drilling as appropriate for the installation.

D. Directional drilling method shall be mechanical with fluid assistance. Pneumatic, water jetting, jacking, and boring method will not be permitted.

E. Install HDPE pressure pipe by directional drilling in accordance with the best industry practice, manufacturer’s recommendations and the Contract Documents.

F. Equipment used to monitor pull-back pressure shall be calibrated prior to each installation.

PART 2 PRODUCTS

3.01 GENERAL

A. Products with surfaces intended to be in contact with the drinking water shall be certified and listed in accordance with NSF 61 for potable drinking water and bear the NSF seal on each section of pipe.

3.02 MATERIALS

A. Polyethylene (PE) Pressure Pipe: The pipe shall conform to AWWA C906 and the following requirements:
   1. Pipe shall be certified and listed for potable water distribution products in accordance with NSF 61 and bear the NSF seal on each section of pipe.
   2. Outside diameter shall conform with ductile-iron pipe for pipes 20-inch and smaller and iron pipe size for 24-inch and above.
   3. Material for pipe manufacturing shall be PE 3408 high density polyethylene (HDPE) meeting ASTM D3350 cell classification of 345444C.
   4. Pipe shall be pressure class PC 160 with a standard dimension ratio (DR) of 11.
   5. Fittings shall be made of material meeting the same requirements as the pipe.
   6. Pipe used for reclaimed water service shall be supplied with purple stripe to designate pipe as reclaimed water.

PART 3 EXECUTION

4.01 GENERAL

A. Investigate the subsurface conditions at the crossing location.

B. Provide water for the drilling process.

C. Handle HDPE pipe in accordance with manufacturer's recommendation.

D. Utilize pipe rollers during layout and pull-back operations to prevent excess sagging of the pipe. Pipe rollers shall be of sufficient size to fully support the weight of the pipe while being hydro-tested before installation and during pull-back operations.

E. Directional drilling procedure shall include provisions to guard against electrical shock such as ground mats, ground cables, hot boots and gloves. Drilling equipment shall include an alarm system capable of detecting electrical current as it nears electrical lines.

F. Maintain log sheets for drilling fluid pressure, flow rate, drill thrust pressure, pull-back pressure, drill head torque and drill head location plots at 20 foot intervals.

G. Drilling fluids shall be inert and of no risk to the environment. No fluid will be utilized that does not comply with permit requirements and environmental regulations. Drilling fluid should remain in the bore hole to increase the stability of the surrounding soil and to reduce the drag on the pulled pipe.

H. If an obstruction is encountered during the drilling operation, efforts should be made to remove the obstruction. If obstruction cannot be removed, withdraw the drilling head and fill the void with 1:3 portland cement grout at 50 psi. If the head cannot be withdrawn, seal ends before moving to another site. Engineer shall approve location of new drilling site. A maximum of two (2) attempts as described above shall be made by the Contractor at the bid unit or lump sum price.

I. If after the second attempt it is found to be impossible to install the pipe by drilling due to rock or some other obstruction, a change order will be negotiated for placing the pipeline by open-cut or tunneling in accordance with the Contract Documents.

J. No additional payment will be made for failed attempts.

4.02 DIRECTIONAL DRILLING

A. General
   1. Drill pilot hole along the path shown on the Drawings to the following tolerances:
      a. Vertical Location - Plus or minus 1 foot
      b. Horizontal Location - Plus or minus 6 feet.
   2. At the completion of the pilot hole drilling, provide a tabulation of coordinates referenced to the drilled entry point which accurately describes the location of the pilot hole.
   3. For drills under non-structural conditions, perform reaming diameter to 1.25 to 1.5 times the outside diameter of the HDPE pipe (bell joints for DIP) being installed. Prepare pipe to facilitate connection to the remainder of the pipeline being installed.
   4. For drills under structural conditions (i.e., roadways), perform reaming diameter to 2 inches maximum greater than outside diameter of the pipe being installed. If larger size is necessary, provide statement from North Carolina Professional Engineer stating that “an overbore in excess of 2-inches will arch and no damage will be done to pavement or sub-grade”.

B. Polyethylene (PE) Pressure Pipe
   1. Joints at the ends of directionally drilled runs shall be fusion bonded to the adjacent pipe section. Mechanical couplings are not permitted. Fusion bonding may be accomplished through the use of butt fusion or electrofusion coupling techniques as specified.
   2. Use care to protect the pipe from scarring, gouging, or excessive abrasion.
   3. Method of connection between HDPE pipe and other pipe materials shall be as indicated on the Drawings
   4. Pipe shall be deflected within the tolerances as provided by the pipe manufacturer.
   5. Allow one week from the time of installation for pipe to be connected other piping systems to allow tensional stresses to relax.

4.03 CLEAN UP

A. Upon completion of the pipe installation, backfill the drilling pit and receiving pit as specified.

B. Properly remove and dispose of drilling fluid and spoil material in compliance with relative environmental regulations, right-of-way and work space agreements under permit requirements. Drilling fluid returns at locations other than the entry and exit points shall be minimized. Immediately clean up drilling fluid that inadvertently surfaces.

4.04 FIELD TESTS

A. Prior to Installation Contractor may elect, at his expense, to hydrostatically test or perform a low pressure air test on the pipe line to determine the integrity of the butt fusion joints. This shall not be considered an alternative to the testing required after installation.

B. Following installation test HDPE pipe in accordance with pressure testing in Section 33 14 13, Water Distribution System.

END OF SECTION

SECTION 33 05 07.23

BORE AND JACK OF CONDUITS

PART 1 GENERAL

1.01 SCOPE

A. Provide, complete in place, carrier pipe installed within steel encasement pipe under railroads and highways as indicated on the Drawings.

1.02 RELATED SECTIONS

A. The following Sections have work that is directly related to this Section. This does not relieve the Contractor of his responsibility of proper coordination of all the work:
   1. Section 31 23 33 Trenching for Utilities
   2. Section 33 14 13 Water Distribution System

1.03 INDUSTRY REFERENCES

A. The latest revision, at the time of bidding, of the publications listed below form a part of this specification.
   1. Highway Crossing: Install pipe under highways in accordance with "Policies and Procedures for Accommodating Utilities on Highway Rights-of-Way," NC Department of Transportation, as a minimum.
   2. Railroad Crossings: Install pipe under railroads in accordance with Part 5.3, Specifications for Pipelines Conveying Non-Flammable Substances, American Railway Engineering Association (AREA), as a minimum.

1.04 SUBMITTALS

A. Submit the following in accordance with Section 01 33 00, Submittal Procedures:
   1. Affidavit of Compliance: Affidavit shall attest that supplied products conform to the referenced standard and this specification and that all tests set forth in each applicable referenced publication have been performed and that all test requirements have been met. Submit for each of the following materials:
      a. Encasement Pipe.
   2. Catalog Data: Submit manufacturer's standard drawings or catalog cuts for the following. Clearly indicate equipment to be furnished for the Project including options to be provided.
      a. Pipe support.
      b. Casing seal.

1.05 QUALITY ASSURANCE

A. Work covered in this Section of the specifications is within the right(s)-of-way of the following:
   1. N.C. Department of Transportation (NCDOT)
      a. All Work in Randolph County
      b. Division No. 8, District No. 1
      c. Dist. Supervisor – RJ Monroe
   2. 300 DOT Drive
      Asheboro, NC 27205
   3. 336-318-4000

B. Bear costs, including but not limited to, bonds, insurance, coordination, inspection fees, flagmen, permanent and temporary signage, etc. as required by the respective agency indicated above. Specific agency requirements are indicated in the Encroachment Agreement as attached to Section 00 73 00, Supplementary Conditions.

C. Comply with requirements of the Encroachment Agreement(s).

D. Prior to start of Work provide notifications as indicated in the Encroachment Agreement.

E. Work shall conform to the requirements and be subject to the approval of the above agency.

PART 2 PRODUCTS

2.01 MATERIALS

A. Encasement Pipe: Encasement pipe shall be uncoated, welded steel meeting ASTM A-139, Grade B, with minimum yield strength of 35,000 psi. Pipe length, and size shall be as indicated on the Drawings. The minimum wall thickness shall be as shown below. Encasement thickness shall be stenciled on exterior of pipe.

1. N.C. Department of Transportation

Pipe (OD-inches)	Wall Thickness (inches)
4 - 12-3/4	0.188
16 - 24	0.250
30	0.312
36	0.375
42	0.500
48	0.500

2. Railroad

Pipe (OD-inches)	Wall Thickness (inches)
12-3/4 & under	0.188
16	0.281
24	0.375
30	0.469
36	0.531
42	0.625
48	0.688
54	0.781
60	0.844
66	0.938
72	1.000

B. Carrier Pipe: Carrier pipe shall be of the type, size, and joints as indicated on the Drawings and specified in Section 33 14 13, Water Distribution System and Section, Sanitary Sewer System.

C. Pipe Support: Provide pipe supports designed and manufactured for the support of the carrier pipe size and material to be used for the Project within the encasement size indicated on the Drawings. Supports shall be designed to carry the pipe at the support spacing specified and meet the following minimum requirements:
   1. Band Width: 8 inches for pipes 14 inches and under and 12 inches for pipes 16 inches and over.
   2. Band and Riser Material: 14 gauge steel for band and riser except if the riser is over 6 inches high the steel shall be 10 gauge for riser. Riser shall be of the channel shape. Band with risers shall a fusion bonded PVC coating of a minimum of 10-mil thickness. Band shall be bolted together with stainless steel bolts, nuts, and washers.
   3. Band Liner: Provide PVC liner a minimum of 0.09 inches.
   4. Runners: Glass Reinforced Polyester or UHMW Polymer plastic. Runner shall be a minimum of 1 inch wide and not more than 1 inch shorter than the bandwidth. Provide 2 top and 2 bottom runners for pipe sizes through 12 inches and 2 top and 4 bottom runners for pipes over 12 inches.
   5. Pipe position within casing: Centered and Restrained.
   6. Support Spacing:
      a. General:
         1) Provide a support within one foot on each side of joints. Provide a support within one foot of each end of casing.
         2) Provide additional supports as needed per manufacturer's recommendations.
      b. PVC: Provide pipe supports at a maximum of 6 foot spacing along pipe in addition to the above requirement.
   7. Supports shall be as manufactured by Advance Products & Systems, Inc., Pipeline Seal and Insulator, Inc or equal.

D. Casing End Seal: Provide casing seal designed and manufactured for sealing around the casing and carrier pipe. The seal may be a wrap-around or a pull-on. Seal shall be made of 1/8-inch thick synthetic rubber. Seal shall be secured with stainless steel banding straps with worm gear tightening device.

PART 3 EXECUTION

3.01 GENERAL

A. Verify the subsurface conditions at each boring site. Payment will not be made for encasement pipe installed but not usable.

B. Stabilize and maintain bore pit bottom to provide proper equipment support and maintain pipe alignment. Dewater as necessary for site. Excavate bore pit in accordance with OSHA regulations. Provide adequate barricades, railings, and warning lights throughout the boring operation. Conduct operation in such a manner so as not to create a hazard to, nor impede the flow of traffic.

C. Install encasement pipe by dry boring and jacking.

D. Boring auger diameter shall not be greater than the outside diameter of the encasement pipe and shall not extend more than 6-inches ahead of the cutting edge of the encasement pipe. Fill voids that are formed during the operation with a 1:3 portland cement grout pumped at 50 psi to ensure that there will be no settlement of the roadway.

E. As the boring operation progresses, butt weld each new section of the encasement pipe to the section previously jacked into place. Maintain proper alignment. Confirm the grade of the encasement pipe as the Work progresses.

F. If an obstruction is encountered during the boring operation, efforts should be made to remove the obstruction. If obstruction cannot be removed, withdraw the encasement pipe and fill the void with 1:3 portland cement grout at 50 psi. If the encasement pipe cannot be withdrawn, seal ends before moving to another bore site. Engineer shall approve location of new bore site. A maximum of two (2) attempts as described above as necessary, including additional bore pits, shall be made by the Contractor at the bid unit price.

G. If, after the second attempt, it is found to be impossible to install the encasement pipe by boring due to rock or some other obstruction, a change order will be negotiated for placing the pipeline by appropriate method in accordance with the Contract Documents.

H. Provide seals at each end of encasement pipe.

3.02 CARRIER PIPE

A. Install carrier pipe in the encasement pipe using manufactured pipe supports. Supports shall prevent movement of the carrier pipe within the encasement. Space supports as specified.

END OF SECTION

SECTION 33 05 63

PRECAST CONCRETE WATER STRUCTURES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Rectangular, monolithic, or sectional precast water and wastewater structures, pipe connectors, and accessories.

1.02 RELATED SECTIONS

A. Section 31 23 33 – Trenching for Utilities.

1.03 REFERENCES

A. Prestressed Concrete Institute: Manual for Quality Control for Plants and Production of Precast and Prestressed Concrete Products.

B. National Precast Concrete Association: Quality Control Manual for Precast Concrete Plants.

C. American Society for Testing and Materials (ASTM):
   1. C858 Standard Specification for Underground Precast Utility Structures
   2. C890 Standard Practice for Minimum Structural Design Loading for Monolithic or Sectional Precast Concrete Water and Wastewater Structures.
   3. C891 Standard Practice for Installation of Underground Precast Concrete Utility Structures.
   4. C923 Standard Specification for Resilient Connectors Between Reinforced Concrete Manhole Structures, Pipes and Laterals.
   5. C913 Standard Specifications for Precast Concrete Water and Wastewater Structures.

D. American Association of State Highway and Transportation Officials: Standard Specification for Joints for Circular Concrete Sewer and Culvert Pipe Using Flexible Watertight Gaskets (AASHTO M198).

E. American Concrete Institute: Building Code Requirements for Reinforced Concrete (ACI 318).

F. Occupational Safety and Health Administration: Standard 1926.704 - Requirements for Precast Concrete.

1.04 SUBMITTALS

A. Submit in accordance with Section 01 33 00, Submittal Procedures:
   1. Affidavit of Compliance: Affidavit shall attest that supplied products conform to the referenced standard and this specification and that all tests set forth in each applicable referenced publication have been performed and that all test requirements have been met.
   2. Catalog Data: Submit manufacturer’s standard drawings or catalog cuts for the following. Clearly indicate items to be furnished for the project including options to be provided.

a. Each type of precast concrete structure.
b. Hatches.
c. Joint Materials.
d. Connectors.
e. Access Ladder and Safety Post

3. Sealed Calculations
   a. Structural analysis and design calculations for Precast Components, performed in accordance with applicable codes and standards, showing that allowable stresses will not be exceeded when installed as shown on the Drawings. All calculations must be sealed by a Professional Engineer registered in the State of North Carolina employed by the Precast Concrete Manufacturer.

1.05 QUALIFICATIONS

A. The Precast Manufacturer shall be a NCDOT approved manufacturer of Precast Concrete Structures and have a minimum of 5 years experience in manufacturing the required components.

B. The Precast Manufacturer shall have a recognized Quality Improvement Process installed at the manufacturing facility.

C. The Precast Manufacturer shall employ at least one Registered Professional Engineer at the manufacturing facility through the life of the project.

D. Concrete compressive strength testing shall be performed in a laboratory inspected by the CCRL of the National Bureau of Standards. Testing shall be performed by Grade I ACI Certified Laboratory Technicians or by Level I PCI Certified Technicians.

1.06 REFERENCE STANDARDS

A. ASTM C858 - Standard Specification for Underground Precast Concrete Utility Structures.

B. ASTM C891 - Standard Practice for Installation of Underground Precast Concrete Utility Structures.

PART 2 PRODUCTS

2.01 MATERIALS

A. Concrete shall conform to ASTM C858 and as follows:
   1. Compressive strength: 5000 psi minimum at 28 days.
   2. Air Content: 4 percent minimum.
   3. Cementitious Materials: Minimum of 564 pounds per c.y.
   4. Coarse Aggregates: ASTM C33. Sound, Crushed, Angular Granitic Stone only. Smooth or rounded stone shall not be used.
   5. Fine Aggregates: ASTM C33. Free from organic impurities.
   6. Chemical Admixtures: ASTM C494. Calcium Chloride or admixtures containing calcium chloride shall not be used.
   7. Air Entraining Admixtures: ASTM C260.

B. Reinforcing steel shall be ASTM A615 grade 60 deformed bar, ASTM A82 wire or ASTM A185 welded wire fabric.

C. Lift loops shall be ASTM A416 steel strand. Lifting loops made from deformed bars are not allowed.

D. Butyl Rubber Sealant shall conform to Federal Specification SS-S-210A, AASHTO M-198, Type B - Butyl Rubber and as follows: maximum of 1% volatile matter and suitable for application temperatures between 10 and 100 degrees F.

E. Butyl Rubber with Bentonite Sealant shall contain 99% solids with a maximum of 1% volatile matter and suitable for application temperatures between 5 and 125 degrees F.

F. Epoxy Gels used for interior patching of wall penetrations shall be a 2-component, solvent-free, moisture-insensitive, high modulus, high-strength, structural epoxy paste adhesive meeting ASTM C-881, Type I and II, Grade 3, Class B and C, Epoxy Resin Adhesive.

2.02 COMPONENTS

A. Precast Component Fabrication and Manufacture shall be as described in this paragraph and as described in the paragraphs for the specific components.
   1. Precast concrete structure shall be watertight.
   2. Precast Manufacturing shall be in conformance with ASTM C858. Wall and inside slab finishes resulting from casting against forms standard for the industry shall be acceptable, except form ties through the wall of the product are not allowed. Exterior slab surfaces shall have a float finish. Small surface holes, normal color variations, normal form joint marks, and minor depressions, chips and spalls will be tolerated. Dimensional tolerances shall be those set forth in the appropriate References and as specified below.
   3. Joint surfaces on joints between Precast Structure Components shall be keyways or tongue and grooves manufactured to the joint surface design and tolerance requirements of ASTM C858.
   4. Lift Inserts and Holes shall be sized for a precision fit with the lift devices, shall conform to OSHA Standard 1926.704, and shall not penetrate through the precast structure wall.
   5. The structural design of Precast Components shall be in accordance with applicable codes and standards listed in Article 1.05 of this Specification Section. No less than 80 psf per foot of depth of Equivalent Fluid Pressure should be used for lateral earth design loads plus the lateral surcharge design loads possible from HS-20 Traffic. Vertical design loads shall include structure dead loads, earth loads, hydrostatic loads, and traffic live loads where applicable with no less than 300 psf live load. The empty and liquid full container conditions shall both be considered.

B. Precast Base Sections shall be cast monolithically without construction joints, or with an approved PVC waterstop cast in the cold joint between the base slab and the walls. Where shown on the Project Plans, Base Section Slab Extensions shall be provided. The width of the extensions shall be the slab thickness unless shown differently. If extensions are not part of the monolithic base, then extensions must be dowelled into base as designed and sealed by N.C. Professional Engineer.

C. As option to precast base, a cast-in-place concrete base as designed by the precaster and sealed by a N.C. Professional Engineer may be used.

D. The Minimum Lay Length of Precast Riser Sections shall be 36 inches.

E. Precast Top Sections shall be cast monolithically without construction joints, or with an approved PVC waterstop cast in the cold joint between the base slab and the walls. Joints cast on top sections for round manhole Transition Assemblies shall have ASTM C361 joint surfaces.

F. Pipe to Precast Structure Connectors shall conform to ASTM C923.

G. Joints between Precast Components shall be sealed with a polyethylene backed flat butyl rubber sheet no less than 1/16 inch thick and 6 inch wide applied to the outside perimeter of the joint. Joints shall also be sealed internally with a sealant having a cross-sectional area no less than the joint annular space times the joint height as follows:
   1. Butyl Rubber Sealant in joints with perimeters less than 18 feet.
   2. Bentonite impregnated Butyl Rubber Sealant in all other joints.

H. Access Hatch
   1. Provide access hatches in conformance to the following requirements:
      a. Size as indicated on the Drawings. The size on the Drawings is for the required minimum clear opening. Unless specifically indicated on the Drawings the doors can be single or double door as required for opening size.
      b. Frame shall be aluminum extrusion and aluminum checkered tread plate for the door(s). Frame shall be equipped with necessary anchors for setting in concrete. Hinges, nuts, bolts, and washers shall be stainless steel and tamper proof from outside.
      c. Design and construct hatches for a minimum 300 lb. live load unless an H20 load is indicated on the Drawings.
      d. Provide the following:
         1) Bituminous coating at locations, which will have contact with concrete.
         2) Waterproof hatch where indicated on the Drawings.
         3) Positive open door latch.
         4) Retractable lifting handle.
         5) Double doors shall be interlocked.
         6) Padlocking provision. Provide lock for each hatch and keyed alike for multiple hatches.
         7) Provide a stainless steel interior automatic slam lock with an interior operating handle. The lock shall be operated from the outside by a removable handle key.
         8) Provide doors requiring greater then a 50 lb lift with a stainless steel spring assist.
      e. Hatches shall be of one manufacturer.

I. Lifting Devices for handling Precast Components shall be provided by the Precast Manufacturer and shall comply with OSHA Standard 1926.704.

J. Access Ladder and Safety post shall be provided with rungs that are 18” wide x ¾” flat dia. Solid steel spaced 12” apart. Sturdy 2-1/2” x 3/8” flat steel side rails and 7” stand-off brackets. Suitable for 350 pounds, powder coated yellow. Steel safety post shall be a lock up bracket that automatically locks in the fully raised position for user stability, fall prevention and safety. The release lever allows the post to be easily lowered to its retracted position for easy operation. The overall height shall be 63 inches with a yellow powder coat finish. The adjustable mounting hardware accommodates multiple ladder rung sizes and spacing. Includes a pull up loop designed to assist in raising the post for user convenience.

K. Coatings: Where shown on the Plans, the interior/exterior of the Precast Structure wall shall be coated with 21 mils of Coal Tarp Epoxy, Kop-Coast Bitumastic No. 300-M or equal. The coating shall be spray applied according to the manufacturer’s recommendations by an applicator with a minimum of 5 years experience.

PART 3 EXECUTION

3.01 EXAMINATION

A. Inspect Precast Components prior to unloading from the delivery truck.

3.02 PREPARATION

A. Product Delivery, Storage, and Handling: Coordinate delivery with the manufacturer, handle and store the Precast Components in accordance with ASTM C891 and the manufacturer's recommendations using methods that will prevent damage to the components and their joint surfaces.

3.03 PLACING PRECAST CONCRETE SECTIONS

A. Excavate to the required depth and remove materials that are unstable or unsuitable for a good foundation. Prepare a level, compacted foundation extending 6" beyond the precast base and follow ASTM C891 excavation standards.

B. Set base plumb and level, aligning pipe opening with pipe invert.

C. Thoroughly clean joint tongue and grooves to remove dirt and other foreign materials that may prevent sealing. Unroll the Butyl Sealant rope directly against bottom groove. Leave protective wrapper attached until sealant is entirely unrolled against groove. Do not stretch. Overlap from side to side not top to bottom.

D. Set risers and tops, aligning internal wall surfaces, so that proper alignment is achieved, taking particular care to clean, prepare and seal joints.

E. When recommended by the manufacturer, fill the void between horizontal joint surfaces with a sand cement grout around the outside perimeter as risers are set.

F. After joining precast sections, apply the butyl sealant sheet around the outside perimeter of the joints below grade.

G. Secure Pipe Connectors to Pipe according to the Connector Manufacturer Instructions. When pipe stub outs are installed, provide restraint from longitudinal movement before backfill.

H. Lift Holes leaving less than 2" of wall thickness shall be plugged from the outside using a sand cement mortar and then covered with butyl sealant sheet. Lift Holes penetrating the wall shall be additionally sealed with an interior application of an epoxy gel 1/8" thick extending 2" beyond the penetration.

I. Perform the final finishing to the Structure interior by filling all chips or fractures greater than 1/2" in length, width or depth and depressions more than 1/2" deep in inverts with a sand cement mortar. Clean the interior of the Structure, removing all dirt, spills or other foreign matter.

END OF SECTION

SECTION 33 14 13

WATER DISTRIBUTION SYSTEM

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Work under this section includes, but is not limited to, piping, valves, fire hydrants, water service line, and appurtenances for a complete potable water distribution system.

1.02 RELATED SECTIONS

A. The following Sections have work that is directly related to this Section. This does not relieve the Contractor of his responsibility of proper coordination of all the work:
   1. Section 31 23 33 Trenching for Utilities
   2. Section 33 05 07.23 Bore and Jack of Conduits

1.03 REFERENCE STANDARDS

A. AWWA C515

B. ASSE 1013 - Performance Requirements for Reduced Pressure Principle Backflow Prevention Assemblies.

C. ASSE 1015 - Performance Requirements for Double Check Backflow Prevention Assemblies.

D. ASSE 1060 - Performance Requirements for Outdoor Enclosures for Fluid Conveying Components.

E. AWWA C104/A21.4 - Cement-Mortar Lining for Ductile Iron Pipe and Fittings.

F. AWWA C110/A21.10 - Ductile-Iron and Gray-Iron Fittings.

G. AWWA C111/A21.11 - Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings.

H. AWWA C115/A21.15 - Flanged Ductile-Iron Pipe with Ductile-Iron or Gray-Iron Threaded Flanges.

I. AWWA C150/A21.50 - Thickness Design of Ductile-Iron Pipe.

J. AWWA C151/A21.51 - Ductile-Iron Pipe, Centrifugally Cast.

K. AWWA C153/A21.53 - Ductile-Iron Compact Fittings.

L. AWWA C509 - Resilient-Seated Gate Valves for Water Supply Service.

M. AWWA C515 - Reduced-Wall, Resilient-Seated Gate Valves for Water Supply Service.

N. NSF 61 - Drinking Water System Components - Health Effects.

O. Publications are referred to in the text by basic designation only.
   1. American Water Works Association (AWWA)
   2. National Sanitation Foundation (NSF) Standards

P. SUBMITTALS

1. Submit the following in accordance with Section, Submittal Procedures:
    a. Affidavit of Compliance: Affidavit shall attest that supplied products conform to the referenced standard and this specification and that all tests set forth in each applicable referenced publication have been performed and that all test requirements have been met. Submit for each of the following materials:
        1) Pipe and Fittings
            (a) Ductile iron
        2) Valves
            (a) Gate
            (b) Electronic Control Valve
            (c) Check
            (d) Air release
        3) Fire hydrants
        4) Meters
        5) Pressure Gauges
        6) Pressure Transmitters
    b. Catalog Data: Submit manufacturer's standard drawings or catalog cuts for the following. Clearly indicate equipment to be furnished for the Project including options to be provided.
        1) Pipe and Fittings
            (a) Ductile iron
        2) Valves
            (a) Gate
            (b) Electronic Control Valve
            (c) Check
            (d) Air release
        3) Valve boxes
        4) Fire hydrants
        5) Meters
        6) Pressure Gauges
        7) Pressure Transmitters
    c. Reports:
        1) Field test report for each section of pipe for the following:
            (a) Measured chlorine residual
            (b) Bacteriological test
            (c) Pressure test
        2) Field test report for each backflow prevention device.
    d. Operation and Maintenance Instructions: Submit complete operation and maintenance manual for the following:
        1) Valves
        2) Fire hydrants
        3) Meters

Q. DELIVERY, STORAGE, AND HANDLING
1. Provide a suitable pipe hook and/or rope sling properly certified for the load when handling the pipe with a crane, excavator, or backhoe. Lifting of the pipe shall be done in a vertical plane. Under no conditions shall the sling be allowed to pass through the pipe unless adequate measures are taken to prevent damage to both the tongue and groove ends.

2. Deliver pipe in the field as near as practicable to the place where it is to be installed. Distribute pipe along the side of the trench opposite to the spoil bank. Where necessary to move the pipe longitudinally along the trench, it shall be done in such a manner as not to injure the pipe or coating.
3. Shield PVC pipe, PEX tubing and associated fittings stored on site from the sun's ultraviolet rays by suitable cover, or indoor storage.

PART 2 PRODUCTS

2.01 GENERAL

A. Products with surfaces intended to be in contact with the potable water shall be certified and listed in accordance with NSF 61 for potable water.

2.02 DUCTILE IRON PIPE

A. Pipe 3-inch to 64-inch shall conform to AWWA C150/A21.50, AWWA C151/A21.51 and the following requirements:
   1. Pipe Size(s): As indicated on the Drawings
      a. Nominal Laying Length: 20-feet
      b. Minimum Pressure class: 250
      c. Minimum Laying Condition: Type 3 See Section 31 23 33 Trenching for Utilities

B. Pipe Joints:
   1. Below ground service: Push-on or Mechanical conforming to AWWA C111/A21.11 and AWWA C151/A21.51.
   2. Above ground service: Flanged conforming to AWWA C115/A21.15.

C. Fittings: Conform to AWWA C110/A21.10, or AWWA C153/A21.53 and to the following requirements:
   1. Below ground service: Mechanical joints
   2. Above ground service: Flanged AWWA C115/A21.15
      a. Pressure Class: 250
      b. Flange Material: Ductile Iron
      c. Pipe wall thickness: As required by AWWA C115/A21.15
   3. Material: Ductile Iron

D. Lining / Coating for Pipe & Fittings
   1. Interior Lining: AWWA C104/A21.4 Cement-mortar with seal coat and certified by NSF 61 .
   2. Exterior AWWA C151/A21.51 - Asphaltic coating approximately 1 mil thick.
   3. Fittings, Not to be Painted: In lieu of exterior asphaltic coating and interior cement lining, fittings may be provided with a 6-8 mil nominal thickness fusion bonded epoxy coating inside and out in conformance with AWWA C116 and certified by NSF 61.

E. Special Pipe Joints
   1. Restrained
      a. Restrained joint pipe and fittings shall meet all AWWA standards and other requirements as specified above for standard ductile iron pipe and fittings unless addressed herein.

b. Field made joints may be considered allowable if approved by the Engineer, but should be avoided where possible. Careful planning to locate field cuts in standard pipe sections is preferred. For field made joints in restrained piping, use field weldments or an insert equal to TR Flex Gripper Rings or approved gasket type field made joints.
c. Restrained joint fittings shall be provided by the restrained joint pipe supplier where located within restrained joint pipe sections. Fittings shall be of the same model / type as the pipe supplied from the pipe manufacturer.
d. Restrained joint fittings may be push-on joint type.
e. Megalugs, Series 1100, as manufactured by EBAA Iron Sales or approved equal shall be allowable for restraint where fittings or valves are not available with restrained joints from the pipe manufacturer.
f. Where additional fittings/valves are required for pipes not shown on Drawings, consult with Engineer for length of restrained joint pipe necessary each side of fittings/valve prior to installation of pipe/fitting.
g. Tees for hydrants do not have to be restrained along the main line except where they are within required restrained length of nearby fittings or valves.
h. Contractor shall develop a field layout schedule and drawing for restrained joint pipe installations.

2.03 VALVES

A. General: Valves shall meet the following requirements:
1. Size shall be as required for the pipe size and material as indicated on the Drawings and specified.
2. Open by counterclockwise rotation.
3. Provide an interior protective epoxy coating in accordance with AWWA C550 on ferrous surfaces in contact with the liquid.
4. Components in contact with the liquid shall be in compliance with NSF 61.
5. Standard system working pressure is 150 pressure psi.
6. Equip valves with a suitable means of operation.
7. Ends shall be mechanical joint for underground location and flanged joint for above ground location/underground utility vaults.
8. For buried valves over 5 feet deep, provide extension stems of cold rolled steel to bring the operating nut to within 2 feet of the ground surface. Extension stems shall also be provided as required for floor stands and to floor valve box.
9. Provide valve accessories as required for proper valve operation for valve locations as indicated on the Drawings and as recommended by valve manufacturer.
10. Similar valve types shall be of one manufacturer.

B. Gate Valves, Resilient-Seated: Gate valves 3-inch to 20-inch shall conform to AWWA C509 or AWWA C515 and to the following requirements:
1. O-ring stem seal on non-rising (NRS) stem valves.
2. Ends shall be mechanical joint for underground locations and flanged joint for above ground locations.
3. Valves shall be non-rising stem (NRS) with wrench nut for underground locations and Outside Screw and Yoke (OS&Y) with handwheel for above ground locations unless noted otherwise on the Drawings.

4. Valves 16-inch and larger shall be equipped with gearing to facilitate opening. Gear cases shall be extended or totally enclosed type. Geared valves shall be equipped with indicators to show the position of the gate in relation to the water.
5. Valves 16-inch and larger shall be equipped with a by-pass.
6. Special material for bolts and nuts.

C. Electronic Control Valves: Electronic Control valves 3-inch through 72-inch shall conform to AWWA C504 for potable water and to the following requirements:
   1. Valve Body
      a. The electronic control valve shall be capable of controlling downstream pressure, rate of flow, valve position or select combinations of any of these applications. Solenoid pilot controls equipped onto the electronic control valve are actuated by electrical signals received from SCADA and/or a local VC-22D electronic valve controller. The solenoid pilots either add or relieve line pressure from the cover chamber of the control valve, causing it to open or close, ensuring the process variable signal follows the set-point command signal. This enables remote control over the electronic control valve operations. The process variable signal would come from a flow meter, pressure sensor or other rapid fluctuating process. The electric solenoid pilot controls can also be combined with hydraulic or electronic motorized pilot controls to create a dual function, or fail-safe capability. Upon receiving the remote setpoint command from SCADA or a local command from the electronic valve controller, the electronic valve shall modulate and maintain the desired setpoint value. When the feedback signal deviates from the setpoint, the appropriate opening or closing solenoid on the valve will pulse. As the feedback signal approaches setpoint, this on/off pulse time will gradually decrease to smoothly modulate the valve to setpoint. When the feedback signal is within a programmable dead band, the opening and closing solenoids will lock the cover and the electronic valve will maintain position. Valve shall be equipped with upstream and downstream pressure transmitters capable of interfacing with SCADA system, either directly or via the the electronic valve controller.
      b. Material specifications for the valve shall be as follows:
         1) Body and Cover: Ductile Iron ASTM A536
         2) Main Valve Trim: Bronze, Stainless Steel
         3) Seat: Bronze, Stainless Steel
         4) Stem, Nut and Spring: Stainless Steel
         5) Seal Disc: Buna-N Rubber
         6) Diaphragm: Nylon Reinforced Buna-N Rubber
         7) Internal Trim Parts: Stainless Steel, Bronze, Brass
         8) End Detail: Flanged
         9) Pressure Rating: Class 150B (250 psi max)
         10) Temperature Range: Water to 180° F
         11) Any other wetted metallic parts: Stainless Steel, Bronze, Brass
         12) Coating: Fusion Bonded Epoxy Coating (Interior and Exterior); ANSI / NSF 61 Approved / AWWA coating specifications C116-03
         13) Accessories: Position Indicator, Limit Switch
      c. Main Valve

1) The main valve shall be hydraulically operated, single diaphragm actuated, globe valve. The valve shall consist of three major components: the body with seat installed, the cover with bearing installed and the diaphragm assembly. The diaphragm assembly shall be the only moving part and shall form a sealed chamber in the upper portion of the valve, separating the operating pressure from line pressure. Packing glands, stuffing boxes and/or rolling diaphragm technology will not be permitted and there shall be no pistons operating the main valve or pilot controls. No fabrication or welding shall be used in the manufacturing process. Y-pattern valves shall not be permitted. Main valve shall be certified by NSF/ANSI Standard 61 as a safe drinking water system component.

d. End Connections
   1) End Connections for control valve shall be flanged per ASME/ANSI B16.42, Class 150B.

e. Main Valve Body
   1) No separate chamber(s) below the diaphragm shall be allowed between the main valve cover and body. No fabrication or welding shall be used in the manufacturing process.
   2) The valve shall contain resilient, synthetic rubber disc with a rectangular cross-section contained on three and one half sides by a disc retainer and forming a tight seal against a single removable seat insert. No O-ring type discs (circular, square, or quad type) shall be permitted as the seating surface. The disc guide shall be of the contoured type to permit smooth transition of flow and shall hold the discs firmly in place. The disc retainer shall be of a sturdy one-piece design capable of withstanding opening and closing shocks. It must have straight edge sides and a radius at the top edge to prevent excessive diaphragm wear as the diaphragm flexes across this surface. No hours-glass shaped disc retainers shall be permitted and no V-type or slotted-type disc guides shall be used.
   3) The diaphragm assembly containing a non-magnetic stainless steel stem; of sufficient diameter to withstand high hydraulic pressures and shall be fully guided at both ends by a bearing in the main valve cover and an integral bearing in the valve seat. The valve seat shall be a solid, one-piece design and shall have a minimum five-degree taper on the seating surface for a positive, drip-tight shut off. No center guides shall be permitted. The stem shall be drilled and tapped in the cover end to receive and affix such accessories as may be deemed necessary. The diaphragm assembly shall be the only moving part and shall form a sealed chamber in the upper portion of the valve, separating the operating pressure from the line pressure. No bolts or cap screws shall be permitted for use in the construction of the diaphragm assembly.

4) The flexible, non-wicking, FDA approved diaphragm shall consist of nylon fabric bonded with synthetic rubber compatible with the operating fluid. The diaphragm's center hole for the main valve stem must be sealed by the vulcanized process or a rubber grommet sealing the center stem hole from the operating pressure. The diaphragm must withstand a Mullins Burst Test of a minimum of 600 X per layer of nylon fabric and shall be cycled tested 100,000 times to insure longevity. The diaphragm shall not be used as the seating surface. The diaphragm shall be fully supported in the valve body and cover by machined surfaces which support no less than one-half of the total surface area of the diaphragm in either the fully opened or fully closed position. Bellofram type rolling diaphragms shall not be permitted.
5) The main valve seat and stem bearing in the valve cover shall be removable. The cover bearing and seat in the 6" and smaller size valve shall be threaded into the cover and body. The valve seat in the 8" and larger size valves shall be retained by flat head machine screws for ease of maintenance. The lower bearing of the valve stem shall be contained concentrically within the seat and shall be exposed to the flow on all sides to avoid deposits. To insure proper alignment of the valve stem, the valve body and cover shall be machined with a locating lip. No "pinned" covers to the valve body shall be permitted. Cover bearing, disc retainer and seat shall be made of the same material. All necessary repairs and/or modifications other than replacement of the main valve body shall be possible without removing the valve from the pipeline. The valve shall be designed such that both the cover assembly and internal diaphragm assembly can be disassembled and lifted vertically straight up from the top of a narrow opening/vault. Y-pattern valves shall not be permitted. The seat shall be of the solid one piece design. Two piece seats or seat inserts shall not be permitted. Packing glands and/or stuffing boxes shall not be permitted.

2. Pilot Control System
   a. The pilot control shall be through two direct acting two-way solenoid pilot valves controlled by an external power source. The pilot control system shall include strainers and solenoid manual by-pass valves. The pilot control system shall utilize copper control tubing and brass fittings. The solenoid pilot valves either add or relieve line pressure from the cover chamber of the main valve, causing it to open or close as directed by the electronic controller. Solenoids shall have NEMA IV enclosures.
   b. Material specifications for Solenoid Pilot Controls
      1) Body: Brass B283
      2) Pilot Trim: Brass, 303 Stainless Steel
      3) Seals and Disc: NBR
      4) Core and Plugnut: 430F Stainless Steel
      5) Core Springs: 302 Stainless Steel
      6) Shading Coil: Copper
      7) Disc-Holder: CA
      8) Core Guide: CA
      9) Connections: FNPT
      10) Pressure Rating: 400 psi max
      11) Temperature Range: AC - Water to 125° F / DC - Water to 104° F

12) Power Supply: 120 VAC / 60 HZ
13) Enclosure: NEMA Type 1, General Purpose, Watertight
14) Control Tubing: Copper
15) Control Fittings: Brass

3. Factory Assembly
   a. Each control valve shall be factory assembled
   b. The Quality Management System of the factory shall be certified in accordance with ISO 9001: 2008
   c. For all control valves, the factory assembly shall include the complete main valve, pilot valve(s), and all associated accessories and control equipment.
   d. During factory assembly the control valve manufacturer shall make all necessary adjustments and correct and defects.
4. Nameplates
   a. Each Control Valve and associated pilot(s) shall be provided with an identifying nameplate.
   b. Nameplates, depending on type and size of control valve, shall be mounted in the most practical position possible, typically on the inlet side of the valve body.
   c. Nameplates shall be brass and a minimum of 3/32" thick, ¾" high and 2-3/4" long.
   d. Pertinent control valve data shall be etched or stamped into the nameplate. Data shall include control valve Catalog number, function, size, material, pressure rating, end-connection details, type of pilot controls used and control adjustment range.
5. Factory Testing
   a. Each control valve shall be factory tested.
   b. The Quality Management System of the factory shall be certified in accordance with ISO 9001: 2008
   c. Tests shall conform to approved test procedures.
   d. The standard factory tests shall include a valve body and cover leakage test, seat leakage test and a stroke test. Control valves and pilot valves, in the partially open position, with both ends closed off with blind flanges (valves) and pipe plugs (pilots), shall be subject to an air test. The applied air pressure shall be 90 psi minimum. All air pressure tests shall be applied for a minimum of 15 minutes. No visible leakage is permitted through the valve seat, the pressure boundary walls of the valve body, valve cover, pilot body, pilot cover or the body-cover joint.
   e. Control valve manufacturer shall, upon request, offer additional testing, such as high pressure hydrostatic testing, positive material inspection testing, ferrite testing, liquid penetration inspection testing, magnetic particle examination testing and radiographic examination testing.
6. Electronic Valve Controller

a. The electronic valve controller shall provide the interface between a remote computer system and the hydraulic control valve with the ability to tie into SCADA Systems. Preinstalled with standard valve application templates allowing the Electronic Valve Controller to easily be configured to perform a wide range of control valve individual or multiple functions to match the single or multiple application(s) desired of the valve in the piping system. Designed to provide fully programmable monitoring and hydraulic valve control for rate of flow, pressure reducing, pressure sustaining, level control (altitude and modulating), valve position, blending, pressure management or select combinations of any of these applications. Custom valve applications can be programmed upon request.

b. Electronic Two Solenoid Control
   1) Solenoid pilot controls equipped onto the control valve are actuated by electrical signals received from the Electronic Valve Controller which enables remote computer control over the diaphragm valve operations. The solenoid pilots either add or relieve line pressure from the cover chamber of the valve, causing it to open or close as directed by the electronic valve controller. The electric solenoid pilot controls can also be combined with hydraulic or electronic motorized pilot controls to create dual function, or fail-safe capability. The electronic valve controller shall accept an analog 4-20mA feedback signal. Upon receiving the remote setpoint command from the computer system or local command from the operator, the electronic valve controller shall provide proper signals to modulate and maintain the valve at the desired setpoint value. When the feedback signal deviates from the setpoint, using a proprietary Cla-Val PID algorithm, the appropriate opening or closing solenoid on the valve will pulse. As the feedback signal approaches the setpoint, this on/off pulse time will gradually decrease to smoothly modulate the valve to setpoint. Each solenoid is controlled by a solid state relay with zero switching voltage. The total cycle time between each pulse shall be programmable. When the feedback signal is within a programmable dead band, the opening and closing solenoids will lock the cover and the valve will maintain position.

c. Electronic Motorized Pilot Control
   1) Electronic valve control via direct / indirect positioning pilot control (CPC) or via electronic actuated hydraulic pilot control(s) (34 Series), the control valve is actuated using a DC powered 4-20 mA analog command signal received from the Electronic Valve Controller. The controller shall also accept an analog 4-20mA feedback signal. Upon receiving the remote setpoint command from SCADA or local command from the operator, the electronic valve controller shall provide a 4-20 mA analog or digital signal to the electronic motorized pilot(s) to maintain the desired setpoint. This enables simple remote setpoint control over the electronic pilot actuator(s). Upon loss of power, the DC powered motor will become non-operational, leaving the hydraulic set point in its last position. The electronic motorized control scheme can also be combined with hydraulic solenoid pilot(s) and/or hydraulic controls to create dual function, or fail-safe capability.

d. Controller Technical Information

1) The electronic valve controller shall have remote communication capabilities. The controller shall include six (6) configurable 4-20mA analog inputs; six (6) dry contact digital inputs; four (4) 4-20mA analog outputs; two (2) solid-state relays and two (2) mechanical relays. All inputs and outputs shall have a configuration menu which programs signal name, scaling, engineering units, precision, & filtering. When a setpoint or feedback signal has been lost, the controller shall be configured to maintain some known value. When local mode is selected, the controller shall have the ability to output a signal & screen warning noting a local condition.
2) Controller shall include a maximum of four (4) PID loops for multi-function control, with local or remote set point inputs. Each loop shall have the ability to be broken into (4) different control zones with customizable PID parameters in each. The controller shall have a programmable set point ramping feature which linearly changes a set point over time until the desired value is achieved. The electronic valve controller shall have real time dynamic charting capability to compare set point vs feedback signals. Each PID loop shall have an independent output limiting feature which limits the duration a solenoid can remain energized, providing ultimate system protection. In the event of a signal loss, the PID shall have the ability to lock valve in last position, close valve, or open valve.
3) The electronic controller shall have relay outputs capable of Alarm indication to SCADA and shall be capable of generating and sending signal loss warnings and other configurable control actions. Actions (alarm) can include valve failures, other valves to open/close.
4) The controller shall include a built in flow rate calculator. Using a valve position transmitter & DP transmitter (or inlet/outlet pressure transducers), the electronic controller shall calculate and display flow rate. A graphical menu allows the operator to easily select valve size and seat type. A built in totalizer keeps track of total volume as a function of time. Customizable units and reset functionality allow for simplified setup and configuration.
5) The electronic valve controller shall have the ability to retransmit any input signal, variable, or calculation to a SCADA system.
6) The electronic valve controller shall have a high speed logging feature which captures all I/O at a maximum sample rate of 1Hz. Captured data shall be downloadable in .csv file format to a portable memory device such as a USB drive or FTP server.
7) The controller shall have a color TFT screen to graphically display the valve application with real-time system information. The controller display shall have the ability to show all I/O signal readings, PID settings, I/O configuration settings, along with customizable graphics for various warnings. Each signal displayed on the “home” screen is color coded representing normal or lost signal. “Home” screen graphics shall have the ability to be customized.
8) An easy to use five press-button operator interface keypad provides simple navigation through software menus. Security key codes shall be provided to protect against unauthorized changes. An IP-68 rated enclosure shall be provided to house the controller for environmental protection.

9) Each controller enclosure and supporting AC/DC power supply conversion box enclosure (where required), shall be provided standard with an anodized aluminum universal mounting bracket(s), allowing for versatile installation to system piping (horizontally or vertically), wall mounting, panel / cabinet enclosures, Unistrut, valves, & other configurations. Sufficient clearance around controller enclosure should be made for adequate access/wiring. Considerations should be made to comply with all the various local codes, standards and best practices.

e. Multi Function Control
   1) The electronic valve controller shall have the ability to perform multiple functions (PID loops) at once. Ultimately there is only one PID loop in control at a given time, with the remaining loops computing in the background. Advanced Cla-Val algorithms provide seamless crossover between loops, simulating multiple hydraulic pilots. Additionally, using digital inputs or internal variables, PID loops can manually be selected to shift between various types of control.

f. Communications
   1) The electronic valve controller shall come standard with Modbus protocol. This protocol defines a message structure that PLC's will recognize and use, regardless of the type of networks over which they communicate. The valve controller can be configured to communicate on standard Modbus networks using either of two transmission modes: TCP/IP or RTU. Users shall have the ability to select the desired mode, along with communication parameters (IP address, subnet mask, baud rate, etc.). The electronic valve controller shall have a built in VNC server. A viewer/client uses TCP port 5900 to connect to a server (or 5800 for browser access), but can also be set to use any other port.

g. Material specifications for Electronic Valve Controllers are as follows:
   1) Enclosure:
      (a) Enclosure Material: Flame retardant UL rated PC/ABS plastic UV Resistant
      (b) Enclosure Connections: (2) 1/2" Cable Gland Knockouts, (10) 3/8" Cable Gland Knockouts, IP-68 USB Type A & Type B Connection, IP-68 Ethernet Port
      (c) Environmental: IP-68, 2 meter for 48 hours; IP-65 NEMA Type 4; IP-20 Panel Mount
      (d) Enclosure Dimensions: 8.75" H x 6" W x 3.5" D
      (e) Enclosure Weight: 3 lbs
      (f) Mounting Bracket: Anodized Aluminum
   2) Display
      (a) Display Type: 4.3" Color TFT-LCD, 480 x 272 pixels with Polycarbonate screen, scratch resistant
      (b) Display Update Rate: 500 ms
      (c) Programming Method: Mechanical Push Button VNC
      (d) Password: 5 digit
   3) Mass Data Storage
      (a) Type: 4GB SD Card
      (b) Language: English
      (c) Temperature: 14° F to 158° F
      (d) Humidity: 90% RH, non-condensing
      (e) Memory Protection: 10 year life lithium battery

4) Power Requirement
   (a) Power: 300 mA @ 24 VDC (Steady State)
   (b) Voltage Input: 12-24 VDC - Full Function
   (c) Power Protection: Max 32 VDC over voltage; Reverse polarity & short circuit
   (d) Fuse Type: 3A Fuse
5) Inputs
   (a) Analog: (6) Inputs (4-20mA / 0-5 V / 0-10 V)
   (b) Resolution: 10 bit
   (c) Digital: (6) Digital Inputs (Dry Contact)
   (d) Units: Configurable
   (e) Decimal Point: 0 / 0.0 / 0.00
   (f) Signal Filter: Configurable, 0 - 99%
   (g) Totalizer: Configurable Input & Units
   (h) Totalizer Reset: Yes
   (i) I/O Connection: Screw Terminals
6) Outputs
   (a) Analog: (4) Outputs (4 - 20ma)
   (b) Resolution: 10 bit
   (c) Solenoid: (2) Solid State Relay, Zero Switching Voltage
   (d) Relay: (2) Mechanical Relay, Rated Voltage 250VAC, Rated Current 6A
7) Logging
   (a) Configurable: Yes
   (b) Logging Speed: 1 second or greater
   (c) Event Memory: 128 MB rolling memory up to 80,000,000 values capacity (extended to 4GB by SD Card)
   (d) Output: CSV format suitable for exporting to MS Excel
8) Control Parameters
   (a) Control Input: 4-20mA full scale / digital
   (b) Proportional Band: 0-100% (50% default) adjustable in 1% increments independently for opening and closing
   (c) Dead Band: Adjustable 0 to full scale of setpoint signal
   (d) Cycle Time: 0 to 60 seconds in 1 sec. increments
   (e) Integral Band: Adjustable 0 to 60 seconds
   (f) Derivative Band: Adjustable o to 60 seconds
   (g) PID Loops: 4, configurable
   (h) Control Curves: 4
   (i) Retransmission: 4 Analog (4-20mA signal)
   (j) Actions (Alarms): 4 (1 or 2 triggering conditions)
9) Communication
   (a) Local: Mechanical Push Button
   (b) Remote: VNC Server
   (c) Interfaces: GPRS Modem Quad Band / Ethernet / RJ-45 / RS-232 / RS-485
   (d) Protocols: ModbusTCP / ModbusRTU / VNC

D. CHECK VALVES
   1. General: Provide check valves as indicated on the drawings and/or specified herein.

2. Wafer Check Valves: Wafer check valves shall conform to the following requirements:
    a. Wafer type check valves shall be used where indicated and/or specified.
    b. Flat flanges and ring gaskets (rubber or compressed fiber) are required.
    c. The mating companion flange ID must overlap the valve seat in order to provide proper seat retention.
    d. The flange gasket must be properly centered and of the size indicated in the drawings. This is required to achieve a seal between the seat OD and the body ID interface area.

2.04 AIR VALVES

A. Provide air valves in conformance with AWWA C512 and the following:
    1. Valve type shall be an Air Release valve.
        a. Nominal Valve Size: 2 inch
        b. Body, Cover: 304L Stainless Steel
        c. Float: Ultra-High Molecular Weight Polyethylene (UHMW)
        d. Seat: Natural Rubber
        e. Trim: 304 Stainless Steel
        f. O-Rings: Viton
        g. Connection: Male NPT Threaded
    2. Valve shall be designed for the following automatic operation:
        a. Release accumulated air while the main is in operation and under pressure.
        b. Release large amounts of air while line is filling
        c. Admit large quantities of air into the pipeline during draining or if negative pressure occurs
        d. Prevent development of hydraulic transients (surge control)
    3. Valve shall be designed for a system pressure of 100 - 160 psi.
    4. Provide isolating bronze ball valve for connection to main line.
    5. Valve shall be Vent-Tech model manufactured by International Valve Marketing, LLC.

2.05 VALVE ACCESSORIES

A. Valve Box, Below Ground: Boxes shall be high strength cast iron of the screw or telescopic type. Box shall consist of a flare base section, center extension as required, and a top section with the word “WATER” cast in the cover. Length of box shall be such that full extension of box is not required at the depth of water main cover. Valve Boxes shall consist of no more than two sections; dis-similar materials (such as PVC pipe) are not permitted for deep installations

B. Extension Stem (if necessary): Stem shall be sized so as to transmit full torque from the operating mechanism to the valve stem without binding, twisting, or bending. Stem shall be made from extra heavy steel pipe, bronze, stainless steel, cold rolled steel, galvanized. Stem shall be complete with couplings for connection to valve and floor stand where required. When valve extension kits are used they must be as recommended by the valve manufacturer.

2.06 FIRE HYDRANTS

A. Fire hydrants shall conform to AWWA C502 and to the following requirements:
    1. Nozzles: Two (2) 2-1/2-inch hose and One (1) 4-1/2-inch pumper connections
    2. Nozzle threads: Owner standard or National Fire Protection Association (NFPA) for National (American) Standard Fire Hose Coupling Screw Threads.

3. Main valve diameter: 5-1/4.
4. Minimum depth of bury: 42-inches.
5. Inlet connection: 6-inch mechanical joint.
6. Open counterclockwise.
7. Close with water pressure.
8. O-ring seals
9. Traffic model with frangible sections near the ground line designed to break on impact.
10. Provide extension for hydrant standpipe as required to set centerline of hydrant nozzle a minimum of 15-inches and a maximum of 24-inches.
11. Exterior color above ground line shall match Owners.
12. All hydrants of one manufacturer.

2.07 METERS

A. Electromagnetic Flowmeter: Electromagnetic meter shall be suitable for cold water metering and conform to AWWA C715 and to the following requirements:
1. Equipment shall consist of one (1) Proline Promag W 400 electromagnetic flowmeter or equal.
2. Meter size shall be as indicated on the Drawings.
3. Meter ends shall be flanged.
4. Includes output signal feed that can be sent to SCADA system for reporting instantaneous and accumulated flows.
5. Meter readings can be accessed at the meter as well.
6. Wetted Materials shall be hard rubber.
7. Suitable for operating pressure as high as 175 psi.

2.08 PRESSURE GAUGE

A. Pressure gauge shall meet the following requirements:
1. Use Pressure reading locally in meter vault.
2. Liquid Fill Glycerin
3. Dial White aluminum with black markings.
4. Dial Size 4 ½ inch minimum.
5. Tube Material Bronze or Stainless Steel.
6. Case & Ring Aluminum
7. Accuracy 1/2 % of full scale.
8. Stem Location Lower.
9. Gauge reading: Combination reading in psi and feet of water (ft) with range of 0 – 200 (460).
10. Equip with a stopcock.
11. Mounted vertically on piping in location.

B. Proved a ¼-inch tap at locations shown on Drawings for each pressure gauge required.

2.09 PRESSURE TRANSMITTER

A. Pressure transmitter shall meet the following requirements:
1. Use: Pressure reading in meter vault to be utilized in electronic valve controller and to be transmitted via SCADA
2. Enclosure: IP-67
3. Process Connection: 1/4" NPT Male Threaded
4. Electrical Connection: 2 Wire 4-20mA
5. Supply Voltage: 8 - 30 VDC

6. Pressure Range: 0 - 290 PSI
7. Accuracy: ±0.5% of full scale
8. Pressure Overload: 2x max scale
9. Ambient Temperature Range: -40° to 176° F
10. Fluid Temperature Range: 32°F to 176° F
11. Wetted Material : 316 Stainless Steel

2.10 THRUST BLOCKING

A. Provide concrete thrust blocking in accordance with the detail on the Drawings.

B. Thrust blocking is not required where restrained joint fittings and equivalent length of restrained joint pipe are used unless shown otherwise on the Drawings.

2.11 DISINFECTANT

A. The following products may be used as the disinfectant:
   1. Chlorine, liquid: AWWA B301.
   2. Hypochlorite, calcium and sodium: AWWA B300.

PART 3 EXECUTION

3.01 GENERAL

A. Pipe installation shall meet the following general guidelines:
   1. Lay pipe in the presence of Engineer, unless specifically approved otherwise.
   2. Handle pipe and accessories in accordance with manufacturer's recommendations. Take particular care not to damage pipe coatings.
   3. Carefully inspect pipe immediately prior to laying. Do not use defective pipe. Replace pipe damaged during construction.
   4. Lay pipe to grade and alignment indicated on the Drawings.
   5. A minimum distance of 12 inches shall be maintained between the outside of the water main and the outside of other utilities.
   6. Provide proper equipment for lowering pipe into trench.
   7. Do not lay pipe in water or when the trench or weather conditions are unsuitable for the work.
   8. Provide tight closure on pipe ends when work is not in progress.
   9. Keep pipe interior free of foreign materials.
   10. Clean bell and spigots before joining. Make joints and lubricate gasket in accordance with pipe manufacturer recommendations.
   11. Disinfection of pipe during installation:
      a. Soak gaskets for minimum of one hour in a 50 - 100 ppm hypochlorite solution prior to installation.
      b. Mop bells and spigots of pipe, fittings and valves with a 50 - 100 ppm hypochlorite solution immediately prior to making joints.
   12. Block fittings with concrete, or restrain as indicated on the Drawings or as required to prevent movement.

3.02 RELATION OF WATER MAINS TO NON-POTABLE WATER MAINS

A. For the purposes of this paragraph, sewer shall mean any existing or proposed gravity or force main used to convey sanitary or industrial process waste.

B. Lateral Separation of Sewers and Water Mains. Water mains shall be laid at least 10 feet laterally from existing or proposed sewers, unless local conditions or barriers prevent a 10-foot lateral separation, in which case:
   1. The water main shall be laid in a separate trench, with the elevation of the bottom of the water main at least 18 inches above the top of the sewer; or
   2. the water main shall be laid in the same trench as the sewer, with the water main located at one side on a bench of undisturbed earth and with the elevation of the bottom of the water main at least 18 inches above the top of the sewer.

C. Crossings. A water main that crosses a sewer shall be laid a minimum vertical distance of 18 inches from the outside of the water main and the outside of the sewer, either above or below the sewer, with preference to the water main located above the sewer. One full length of water pipe shall be located so that both joints will be as far from the sewer as possible.

D. Water Mains and Reclaimed Water Distribution Lines. Water lines shall be located at least 10 feet horizontally from or at least 18 inches above water pipes carrying treated and disinfected wastewater in reclaimed water distribution lines. Crossings shall be made in accordance with Paragraph (B) .

3.03 VALVES AND FITTINGS

A. Install buried valves on top of an 18-inch square, 3-inch thick, solid concrete pad (minimum dimensions). The concrete pad may be provided by a pre-cast manufacturer or cast-in-place in the field above grade. Concrete used for the pads shall be a minimum 3,000 psi mix. The pads may not be cast-in-place in the pipe trench. Connection to pipe shall be such that there shall be no stress at the joint caused by misalignment or inadequate support of pipe or valve.

B. Valve Box: Set a valve box over each buried valve. Support box so that no stress shall be transmitted to the valve or pipe line. Install box plumb and set top flush with finished grade. Operating nut shall be centered in box. Provide a 24-inch x 24-inch wide by 6-inch thick concrete pad at top of valve boxes outside paved areas.

C. Valve operation nut shall be within 24 inches of the top of box. Provide stem extension if necessary to bring operating nut to within 24 inches of the top of box.

D. Install fittings as recommended by the manufacturer. Fittings shall be blocked or otherwise restrained from movement.

E. Install valves, gates, and accessories indicated on the Drawings and in complete accordance with the manufacturer's recommendations.

F. Install air / vacuum valve inside a manhole.

3.04 HYDRANT

A. Set hydrant in accordance with detail on Drawings.

3.05 PAINTING

A. Equipment shall receive the manufacturer's standard coating for the intended application. Coatings shall be suitable for the intended application.

B. Repaint damaged paint surfaces.

C. Above ground piping and piping within vaults shall be painted in accordance with Section, Painting.

3.06 PRESSURE TESTING

A. Pressure test in accordance with AWWA C600 for ductile iron pipe and AWWA C605 and AWWA M23 for PVC pipe and as specified herein

B. General:
1. The Engineer shall approve the source, quality, and method of disposal of water to be used in test procedures.
2. Obtain Owner's permission 48 hours prior to filling or flushing of pipe system with water from Owner's water system. Owner shall operate valves connected to the existing water system. Where large quantities of water may be required for flushing, Owner reserves the right to require that flushing be done at periods of low demand.
3. Clean and flush pipe system of foreign matter prior to testing.
4. Provide air vents at the high points in the line section to be tested for releasing of air during filling. Service corporation stops may be used for air vent when located at a high point. Include cost of air vents in price of testing. Leave corporation stops in place after testing and note locations on As-Built Drawings.
5. Allow concrete blocking to reach design strength prior to pressure testing.
6. Test main prior to installation of service taps.
7. Repair defects in the pipe system. Make repairs to the same standard as specified for the pipe system.
8. Retest repaired sections until acceptance.
9. Repair visible leaks regardless of the test results.
10. Pipe sections shall not be accepted and placed into service until specified test limits have been met.

C. Testing
1. Notify Owner and Engineer a minimum of 48 hours prior to testing.
2. Perform tests in the presence of Engineer.
3. Make pressure tests between valves. Furnish suitable test plugs where line ends in "free flow."
4. Upon completing a section of pipe between valves, test pipe by maintaining for a two-hour period a hydrostatic pressure of 150 psig.
5. Test pressure shall not vary by more than +/- 5 psi for the duration of the test.
6. No length of line shall be accepted if the leakage is greater than that determined by the following formula based on the appropriate test pressure: (Note: The below formulas are an algebraic reduction of the formula from AWWA C605 for PVC pipe and AWWA C600 for DI of Q = (LD(sq root of P) / 148,000. Assumes 50 joints in 1,000 feet)

Q = Allowable leakage per 1,000 feet of pipe in gallons per hour.
D = Nominal diameter of the pipe in inches.
100 psi: Q = D x 0.07
150 psi: Q = D x 0.08
200 psi: Q = D x 0.09
250 psi: Q = D x 0.10

3.07 DISINFECTION

A. After satisfactory completion of the pressure test, disinfect new potable water mains and existing mains that have required repair in accordance with AWWA C651 and as specified herein.

B. General:
   1. Provide a superintendent experienced in the required procedures for disinfecting with chlorine.
   2. Obtain Owner's permission 48 hours prior to filling, flushing, and chlorinating of the water mains. Owner shall operate valves connected to the existing water system.
   3. Do not allow highly chlorinated water into the existing distribution system.
   4. If there is any question that the chlorinated discharge will cause damage to the environment, a reducing agent shall be applied to the water to neutralize the residual chlorine. Federal, state, or local environmental regulations may require special provisions or permits prior to disposal of highly chlorinated water.
   5. Perform disinfection and testing in the presence of Engineer.

C. Connection to Existing System: Notify Owner 48 hours prior to making connections to the existing system. Thoroughly clean the existing water main exterior prior to the installation of tapping sleeves and corporation stops. Lightly dust with calcium hypochlorite powder the water main exterior and the interior surface of the tapping sleeve, and corporation stops.

D. After satisfactory flushing of the main, disinfect by injection of a chlorine solution. Induce chlorine in sufficient quantity to maintain a chlorine residual of at least 50 ppm throughout the system to be tested. Maintain the chlorine solution in the system for at least 24 hours.

E. Valves and Fire Hydrants: Open and close valves on the mains being disinfected a minimum of three times during the chlorine contact period and a minimum of three times during flushing. Fire hydrants and other appurtenances should receive special attention to insure proper disinfection.

F. Prior to flushing, the free chlorine residual shall be a minimum of 10 ppm. Flushing of the lines shall proceed until the lines contain the normal chlorine residual of the system.

G. Test in the field for free chlorine residual:
   1. Sample location shall be the same as required for the bacteriological test samples.
   2. Immediately after injection of the chlorine solution. Sample shall have a chlorine residual as specified.
   3. Prior to flushing of the highly chlorinated water from the potable water system and a minimum of 24-hours after the initial injection of the chlorine. Sample shall have a minimum chlorine residual as specified.

3.08 BACTERIOLOGICAL TESTING

A. Required location for obtaining water samples:
   1. Every 2,000 lf
   2. End of each main.
   3. A minimum of one from each branch.

B. A laboratory, certified for the required testing by the State of North Carolina, shall collect the sample and perform the testing. The laboratory shall be the same for both sampling and testing.

C. Obtain two water samples at each specified location for bacteriological testing. Take the first sample immediately after flushing the chlorinated water and again in 24-hours.

D. Recommended additional samples. During the required sampling of water from the new system, it is recommended that samples be taken from the existing potable water source to determine if coliforms are present.

E. Take care in sampling. No hose or fire hydrant shall be used for the collection of samples. Take samples from an approved sample tap consisting of a corporation stop installed in the main with a copper tube gooseneck assembly. Operation shall be such as to ensure that the sample collected is from water that has been in the new system. Copper tube gooseneck assembly shall be removed and sample tap corporation stop shut off upon completion of testing bacteriological testing is requirements.

F. Test samples for the presence of coliform organisms in accordance with the latest edition of Standard Methods for the Examination of Water and Wastewater. Testing method used shall be the multiple-tube fermentation technique, the membrane-filter technique, or presence/absence.

G. Test for odor. The water in the new system should also be tested to assure that no offensive odor exists due to chlorine reactions or excess chlorine residual.

H. If samples show the presence of coliform, procedure 1 or 2 described below shall be followed, with the approval of the Owner, before placing the unit or facility in service.
   1. Take repeat samples at least 24 hours apart until consecutive samples do not show the presence of coliform.
   2. Again subject the system to chlorination and sampling as described in this section.

I. If samples are free of coliform, and with the approval of the Owner, the potable water system may be placed in service.

J. Contamination: If, in the opinion of the Engineer, possible contaminants have entered the existing water system, or water samples show the water in the existing system to be unsafe on completion of the work, the existing water system shall be disinfected as specified herein and shall include all contaminated components. Disinfection of the existing system shall be coordinated with the Owner.

3.09 VALVE OPERATION

A. Prior to final acceptance provide competent personnel to operate each valve in presence of Engineer. Verify that valves are left in the open position.

END OF SECTION

APPENDIX 1 -
GEOTECHNICAL REPORT

Report of Subsurface Exploration
PTRWA Water Line
Randleman, North Carolina
S&ME Project No. 23580335

PREPARED FOR:

Wooten
119 Brookstown Avenue, Suite 100
Winston-Salem, North Carolina 27101

PREPARED BY:

S&ME, Inc.
8646 West Market Street, Suite 105
Greensboro, North Carolina 27409

December 19, 2024

December 19, 2024

Wooten
119 Brookstown Avenue, Suite 100
Winston-Salem, North Carolina 27101

Attention: Mr. John Grey, P.E.

Reference: **Report of Subsurface Exploration Services**
PTRWA Water Line
Randleman, North Carolina
S&ME Project No. 23580335
NC PE Firm License No. F-0176

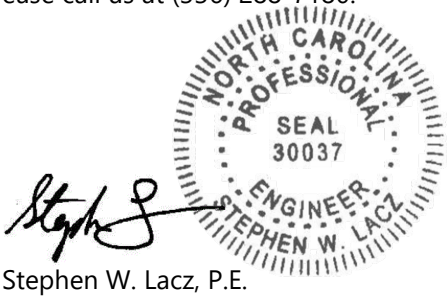
Dear Mr. Grey:

S&ME, Inc. (S&ME) has completed a subsurface exploration for the above referenced project in Randleman, North Carolina. The exploration was performed in general accordance with S&ME Proposal 23580335 dated July 9, 2024. The purpose of this exploration was to explore general subsurface conditions along the water line alignment and evaluate those conditions with regard to geotechnical design and construction. This report presents our findings together with our conclusions and recommendations.

S&ME appreciates the opportunity to provide geotechnical engineering services for this project. If you have questions or need additional information regarding this report, please call us at (336) 288-7180.

Sincerely,

S&ME, Inc.



Shaun Brewer, G.I.T.
Geotechnical Staff Professional

Stephen W. Lacz, P.E.
Senior Engineer/Project Manager
NC Registration No. 030037

Senior Reviewed by: Kasey McWhorter, P.E.

SB/SWL/KM/wj

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Insert: *Important Information About Your Geotechnical Engineering Report*

Appendices

Appendix I Figures
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1.0 Project Information

This proposal is based on the following information:

- Email correspondence between Mr. John Grey with Wooten and Stephen Lacz with S&ME on May 9 and June 28, 2024.
- Email correspondence between Mr. Grey and Mr. Scott Schautschick with S&ME on May 14, 2024.
- Teams meeting between Mr. Grey and Mr. Schautschick on May 15, 2024.
- Information provided by Wooten includes a KMZ file of the proposed water line route.

S&ME understands that Wooton is designing a water line for the Piedmont Triad Regional Water Authority (PTRWA) in Randolph County, North Carolina at the approximate location shown on the Site Vicinity Plan (Figure 1) in Appendix I. The proposed water line route that is the focus of this subsurface exploration extends approximately 3.4 miles along Interstate Highway 74 (I-74) and I-73 between Island Ford Road and Pineview Road as shown in the figure to the right. The exact location of the line is under development at this time.



S&ME has been requested to perform five soil test borings at specific locations along the alignment to explore the soil and groundwater conditions for design and construction of the planned water line. The requested boring locations include a crossing under US-311, a railroad crossing on Old Courthouse Rd, a 400-foot long crossing beneath I-74, and a crossing under Health Dairy Rd. We anticipate these crossings will be done by jack-and-bore methods. We assume the jack-and-bores will extend at least 10 feet below the respective railroad and roadway surface elevations.

2.0 Exploration Procedures

Five soil test borings (B-01 through B-05) were conducted at the approximate locations indicated on the Boring Location Plans (Figures 2A and 2B in Appendix I). Boring locations were located in the field by S&ME personnel using GPS equipment and site features as reference.

The soil test borings were conducted using a track-mounted CME-750 drill rig equipped with an automatic hammer. Hollow stem, continuous flight augers were used to advance the borings to depths ranging from 3.0 to 25 feet below existing grades. Standard Penetration Tests (SPT) were performed in the borings at 2.5-foot intervals in the top 10 feet, then at 5-foot intervals thereafter, in general accordance with ASTM D 1586 to provide an index for estimating strength parameters and relative consistency of subsurface soils. Two borings (B-03 and B-05) encountered auger refusal at depths of 3 feet and 13 feet, respectively. Offset borings to explore the horizontal extent of refusal materials were not performed due to an overhead utility conflict (B-03) and slope restrictions (B-05).

Once the samples were received in our laboratory, the samples were visually examined to estimate the distribution of grain sizes, plasticity, organic content, moisture condition, color, presence of lenses and seams, and apparent geological origin. The results of the classifications as well as the field test results are presented on the individual Boring Logs included in Appendix II. Similar soils were grouped into strata on the logs. The strata contact lines represent approximate boundaries between the soil types; the actual transition between the soil types in the field may be gradual in both the horizontal and vertical directions.

Representative soil samples obtained during the field exploration were tested in S&ME's laboratory to confirm visual classifications of the soils and to evaluate engineering index properties. Laboratory testing included:

- Atterberg Limits (ASTM D 4318),
- Grain Size 200 Wash (ASTM D 422), and
- Natural Moisture Contents (ASTM D 2216).

A summary table and individual laboratory test results are presented in Appendix III.

3.0 Regional Geology

The Geologic Map of North Carolina (1985) indicates the site is in the Piedmont Physiographic Province. The soils in the vicinity of the subject site have formed as a mantle of soil that has weathered in-place from the parent bedrock. These soils have variable thicknesses and are referred to as residuum or residual soils. The residuum is typically fine grained and has a higher clay content near the surface because of advanced weathering. The soils generally become less clayey and more sandy with depth because of less advanced weathering.

The boundary between soil and rock is not sharply defined. This transitional zone termed "partially weathered rock" (PWR) is normally found overlying the parent bedrock, sometime termed intermediate geomaterial (IGM). Partially weathered rock is defined for engineering purposes as residual material that can be penetrated by the drilling rig augers and has standard penetration test blow counts in excess of 50 blows for six inches or less of sampler penetration. Weathering is facilitated by fractures, joints, and by the presence of less resistant rock types. Consequently, the profile of the partially weathered rock and hard rock is quite irregular and erratic, even over short horizontal distances. Also, it is not unusual to find lenses and boulders of hard rock and zones of partially weathered rock within the soil mantle, well above the general bedrock level.

4.0 Site and Subsurface Conditions

The generalized subsurface conditions at the site are described below. A Generalized Subsurface Profile (Figure 3) showing the SPT borings performed are included in Appendix I to graphically summarize subsurface conditions encountered in the borings. For more detailed descriptions and stratifications at a particular boring location, the Boring Logs in Appendix II should be consulted. Elevations on the boring logs and generalized subsurface profile were estimated from the provided site drawings and should be considered approximate.

4.1 Surface Conditions

Topsoil ranging in thickness from 2 to 3 inches was encountered at each of the borings.

4.2 Existing Fill

Man-placed fill soil was encountered underlying the surface materials at boring B-05, extending to the auger refusal and boring termination depth of 13 feet below existing grade. The fill material encountered consisted of sandy silt (ML) and lean clay (CL). SPT N-values ranging from 8 to 18 blows per foot (bpf) were recorded in the fill although the N-values may be elevated due to rock fragments encountered. Moisture contents within the fill soil samples were typically visually judged to be near to below optimum compactable levels at the time of this exploration.

4.3 Residuum

Residual soils resulting from the in-place weathering of underlying bedrock were encountered underlying the topsoil at borings B-01 through B-04. The residual soils encountered consisted of sandy lean clay and sandy silt (CL and ML). SPT N-values typically ranged from 5 to 13 bpf with sporadic higher and lower SPT N-values encountered. Moisture contents within the residual soil samples were typically visually judged to be at or slightly below optimum compactable levels at the time of this exploration.

4.4 Intermediate Geomaterial/Partially Weathered Rock and Auger Refusal Materials

Intermediate Geomaterial (IGM), commonly known as Partially Weathered Rock (PWR), is defined for engineering purposes as residual material that can be penetrated with drill rig augers and has standard penetration resistance values in excess of 50 blows for 6 inches of penetration. IGM/PWR was encountered in borings B-03 and B-04 at a depths of approximately 2 and 19 feet and extended to the boring termination depths of 3 feet and 25 feet, respectively.

Auger refusal is defined as material that could not be penetrated by the drill rig used on the project. Auger refusal was encountered in boring B-03 at a depth of approximately 3 feet and at boring B-05 in fill material at a depth of approximately 13 feet. Offset borings to explore the horizontal extent of refusal materials were not performed due to an overhead utility conflict (B-03) and slope restrictions (B-05).

4.5 Groundwater

Groundwater was not encountered at the time of drilling in the borings to the depths explored. The groundwater level typically fluctuates during the year due to seasonal and climatic changes.

5.0 Evaluation and Recommendations

5.1 Excavations

5.1.1 Cut and Cover

Based on the assumed pipe invert depths of 5 feet to 10 feet or less (below existing grades) and the subsurface conditions encountered in the borings, site excavations will typically extend through low to moderate consistency fill, residual soils, partially weathered rock and/or rock.

Based on subsurface conditions encountered by our exploration, pipeline construction excavations for open cut trenches are generally anticipated to be performed without dewatering, ripping, blasting, or use of hoe rams; however, possible exceptions to this are in areas where auger refusal was encountered at depths shallower than 10 feet (borings B-03 and B-05). Difficult-to-excavate materials may be encountered above planned final grades in areas between and outside the boring locations. In this geology, isolated lenses of more excavation resistant material along the alignment may be encountered which may require hoe ram use, ripping, and/or blasting. If soft, wet material is encountered at or near the planned bottom of excavation, it may be necessary to over-excavate and place washed stone bedding to develop a suitable bearing surface near these locations, particularly where groundwater control is required.

For temporary excavations, shoring and bracing or flattening (laying back) of the slopes should be performed to obtain a safe working environment. Excavations should be sloped in accordance with Occupational Safety and Health Administration (OSHA) (29 CFR Part 1926) excavation trench safety standards. NCDOT and railroad guidelines for excavation shoring and bracing may also apply. We recommend that all excavated soils be placed away from the edges of the excavation, at a distance equaling or exceeding the depth of the excavation. The contractor is solely responsible for site safety. This information is provided only as a service, and under no circumstances should S&ME be assumed to be responsible for construction site safety.

5.1.2 Pipeline Crossings

Based on the assumed pipe invert depths of 5 feet to 10 feet below existing grades at the roadway and railroad crossings and conditions encountered in the borings, site excavations and jack and bore tunneling methods at the roadway and railroad crossing locations will typically extend through low to moderate consistency residual soils. We anticipate pipeline excavations at these locations can be performed using conventional excavation equipment without ripping, blasting, or use of hoe rams. However, **boring B-03 and B-05 encountered auger refusal materials at depths of 3.0 and 13.0 feet, respectively, below existing grade, and harder material more resistant to conventional excavation equipment is expected that will require hoe ram use, ripping, and/or blasting.**

Pipe installation at the roadway and railroad crossings will be performed using untrenched methods. The methods used by the contractor should comply with NCDOT, railroad, and OSHA requirements.

Jack and bore tunneling methods are generally used for untrenched pipe installation and consist of excavating a jacking pit adjacent to the proposed installation location and hydraulically pushing sections of pipe or casing along the alignment. After installation of the first section of casing, additional sections of casing are subsequently welded to the previous section of casing and advanced with the jacking system. Earth removal is generally accomplished by mechanical means such as augers or boring equipment. A receiving pit is constructed at the other end of the tunnel to receive the casing.

The casing is advanced forward using a jacking system. Horizontal forces induced by the jacking system are resisted by the jacking pit support system. It is necessary to provide a relatively uniform distribution of load around the pipe or casing periphery to prevent localized stress concentrations. This is accomplished by using a cushion material between the pipe sections and jacking system. Where extreme jacking pressures are anticipated

due to long jacking distances or excessive friction forces are anticipated, additional pipe casing thickness may be required.

The pipe or casing section should be designed by a registered professional engineer with regard to the anticipated overburden, hydrostatic, and anticipated jacking pressures, if performed.

5.1.3 Design and Installation Considerations – Untrenched and Trenched

As previously indicated, PWR, auger refusal, and/or rock were encountered in three of the five borings to the depths explored. Based on the borings, untrenched and trenched pipe installation will not likely extend through PWR, rock, or auger refusal material at some locations along the pipe alignment; however, **borings B-03 and B-05 encountered auger refusal materials near or above the expected pipe trench depth.** The depth to, and thickness of, PWR, rock lenses or seams and bedrock, can vary dramatically in short distances and between boring locations; therefore, PWR, boulders or bedrock may be encountered during any excavation on this project. Buried objects may also exist in the location of boring B-05 where fill material was encountered. Excavation and maintaining a proper alignment may be more difficult in mixed face conditions, such as PWR/rock and/or highly weathered and fractured rock/slightly weathered rock.

Generally, the upper on-site soils can be excavated with conventional construction equipment. However, where partially weathered rock (SPT N-value greater than 100 blows per foot) is present, loosening with a large dozer (D-8 or similar size) equipped with a single tooth ripper or a large track-mounted backhoe (Caterpillar 235 or similar size) may be required prior to removal. Hard weathered rock and bedrock (auger refusal materials) will require blasting, line drilling, rock splitting, or jackhammering to excavate in utility and other confined excavations. **We recommended the rock be overblasted/overexcavated 1 to 2 feet and washed stone be used to provide a stable, uniform bearing surface for the pipe.**

For classified excavations, we suggest that massive rock excavation be defined as any material that cannot be excavated with a single tooth, hydraulically articulated ripper drawn by a crawler tractor (Caterpillar D-9 or equivalent), occupying an original volume of at least one cubic yard.

Trench rock excavation may be defined as any material occupying an original volume of at least ½ cubic yard or more which cannot be excavated with a Caterpillar 325 or equivalent using a 24-inch wide bucket equipped with rock teeth.

Tunnels should be designed to accommodate the roadway and railroad loading conditions. Deflections from settlement or heave should be limited to NCDOT/railroad requirements. Limiting settlement and heave within tolerable limits is dependent on both the tunneling and overburden material and on the installation method. Survey control should be established at the ground surface along the tunnel alignment and should be monitored regularly. The contractor should be prepared to repair the roadway/railroad if any distress is noted at the roadway surface.

During installation, any voids between the casing and surrounding soil/PWR/rock should be filled with grout upon completion of the casing installation. Care should be taken to avoid excessive grouting pressures that could damage the casing or cause surface disruption to the roadway. If the casing is hydraulically advanced, friction or adhesion between the casing and surrounding materials can be reduced by injecting a bentonite slurry or other

lubricant through ports within the casing. Alternatively, a coating could be applied to the outside of the casing prior to installation to reduce friction, as well as provide some corrosion resistance.

5.1.4 Boring and Receiving Pits

The following items should be appropriately addressed with regard to the design and construction of the installation boring pits:

1. The design and construction of the temporary excavation and/or shoring and bracing systems for the pits should be the responsibility of the contractor. Shoring for the pits should be designed by a registered structural engineer and should be designed to withstand the lateral loads exerted by the surrounding soils, hydrostatic pressures, as well as any anticipated surcharge loads. For boring pits, the back of the pit should be designed to provide adequate thrust for the installation system. Some displacement of the wall will be necessary to develop the passive resistance of the soils behind the wall. Based on our experience we conservatively estimate the following design parameters:

Table 5-1: Untrenched Pipe Installation Pit Design Parameters

Geotechnical Design Parameters	Retained Soil	
	Fill	Residuum
At-Rest Lateral Earth Pressure Coefficient	K_0 = 0.56	K_0 = 0.56
Active Lateral Earth Pressure Coefficient	K_A = 0.39	K_A = 0.39
Passive Lateral Earth Pressure Coefficient	K_P = 2.56	K_P = 2.56
Effective Angle of Internal Friction of Soils	φ′ = 26°	φ′ = 26°
Effective Cohesion of Soils	c′ = 50 psf	c′ = 100 psf
Moist Unit Weight of Soils	γ_{moist} = 115 pcf	γ_{moist} = 125 pcf

2. For temporary excavations, shoring and bracing or flattening (laying back) of the slopes should be performed to obtain a safe working environment. Excavations should be sloped in accordance with Occupational Safety and Health Administration (OSHA) (29 CFR Part 1926) excavation trench safety standards. We recommend that all excavated soils be placed away from the edges of the excavation, at a distance equaling or exceeding the depth of the excavation. The contractor is solely responsible for site safety. This information is provided only as a service, and under no circumstances should S&ME be assumed to be responsible for construction site safety.
3. Surface water must be directed away from the pit areas and sumps with pumps should be available to drain the pits if necessary. Groundwater was not encountered within the borings to the depths explored, however, temporary dewatering should be anticipated during excavation and installation of the shoring systems and during construction. Temporary dewatering can likely be accomplished with sumps.
4. A registered geotechnical engineer should visit the site once the pits are excavated. The purpose of the engineer's visit will be to observe that adequate drainage is in place and dewatering techniques are available, if needed.
5. The boring pits should be backfilled with compacted structural fill immediately after pipe installation is complete and all slopes repaired, as required.

5.1.5 Construction Dewatering

Although groundwater was not encountered in the borings to the depths explored at the time of drilling, the excavation for jacking and receiving pits may extend below the groundwater level along the alignment or wet weather can cause water in the excavations. Construction dewatering may be accomplished by pumping from sumps, wellpoints, or wells many days/weeks in advance of excavation and must be performed continuously (24 hours day/7 days per week) to lower and maintain construction groundwater control. Construction means and methods to accomplish dewatering are customarily left to the discretion of the contractor.

5.2 Structural Fill and Suitability of Site Soils as Backfill

The sandy clay and sandy silt soils encountered in the borings are generally suitable for reuse as backfill and new compacted structural fill. Some moisture conditioning may be required prior to compaction, depending upon contractor stockpile management practices.

New fill required to support pavement or piping should be placed as structural fill. Structural fill should be compacted to 95 percent of its maximum dry unit weight as determined by a standard Proctor test (ASTM D 698). Fat clay (CH) and elastic silt (MH) were not encountered by the borings to the depths explored. If CH and MH soils are encountered along the alignment, they have the potential to shrink and swell with moisture changes and are not recommended for direct support of pavements. Fat clay (CH) and sandy elastic silt (MH) may be reused as structural fill provided at least 2 feet of non-plastic soils separate pavement subgrades from the CH and MH soils. Maximum loose lift thicknesses are dependent on compaction equipment and fill material but should not exceed 8-inches.

Site soil types are generally considered suitable for reuse as backfill to provide cover over the pipes. Moisture conditioning of site soils may be required to achieve compaction requirements. For the pipeline backfill (outside of pavement and structure areas), we recommend backfill be compacted to at least 90% of its maximum dry unit weight as determined by a standard Proctor test to minimize long-term subsidence of the backfill.

5.3 Lateral Earth Pressures

There may not be sufficient horizontal space to lay back all construction excavation side slopes, and temporary shoring and bracing systems may be required. Total and local lateral loads on temporary, flexible construction excavation bracing systems are highly dependent on the stiffness of the wall bracing system and wall deflections. Based on the site soils, we recommend that flexible, braced, temporary site construction excavation bracing systems be designed for a minimum uniform lateral earth pressure on the wall equal to:

$0.65K_A\gamma H$ Where: K_A – active earth pressure coefficient, 0.36
γ – moist soil unit weight, 115 pcf
H – wall height, feet

The above may not apply for other types of excavation bracing systems. This pressure assumes groundwater has been controlled below the bottom of the construction excavation bracing system. Temporary shoring must be designed by a Professional Engineer employed by the contractor to resist lateral earth pressures developed by the

bracing system selected, which may exceed the minimum recommended design lateral earth pressures provided above.

6.0 Limitation of Report

This report has been prepared in accordance with generally accepted geotechnical engineering practice for specific application to this project. The conclusions and recommendations contained in this report are based upon applicable standards of our practice in this geographic area at the time this report was prepared. No other representation or warranty either express or implied, is made.

We relied on project information given to us to develop our conclusions and recommendations. If project information described in this report is not accurate, or if it changes during project development, we should be notified of the changes so that we can modify our recommendations based on this additional information if necessary.

Our conclusions and recommendations are based on limited data from a field exploration program. Subsurface conditions can vary widely between explored areas. Some variations may not become evident until construction. If conditions are encountered which appear different than those described in our report, we should be notified. This report should not be construed to represent subsurface conditions for the entire site.

Unless specifically noted otherwise, our field exploration program did not include an assessment of regulatory compliance, environmental conditions or pollutants, or presence of any biological materials (mold, fungi, bacteria). If there is a concern about these items, other studies should be performed. S&ME can provide a proposal and perform these services if requested.

S&ME should be retained to review the final plans and specifications to confirm that earthwork, foundation, and other recommendations are properly interpreted and implemented. The recommendations in this report are contingent on S&ME's review of final plans and specifications followed by our observation and monitoring of earthwork and foundation construction activities.

A document prepared by S&ME and titled *Important Information About Your Geotechnical Engineering Report* follows this page. This document discusses how geotechnical recommendations are developed based on professional opinions of site subsurface conditions, limited exploration information, and experience. Variations in subsurface conditions can be a principal cause of construction delays, cost overruns, and claims. This document is provided to assist you in understanding and managing the risk of these variations.

Important Information About Your
Geotechnical Engineering Report

Variations in subsurface conditions can be a principal cause of construction delays, cost overruns and claims. The following information is provided to assist you in understanding and managing the risk of these variations.

Geotechnical Findings Are Professional Opinions

Geotechnical engineers cannot specify material properties as other design engineers do. Geotechnical material properties have a far broader range on a given site than any manufactured construction material, and some geotechnical material properties may change over time because of exposure to air and water, or human activity.

Site exploration identifies subsurface conditions at the time of exploration and only at the points where subsurface tests are performed or samples obtained. Geotechnical engineers review field and laboratory data and then apply their judgment to render professional opinions about site subsurface conditions. Their recommendations rely upon these professional opinions. Variations in the vertical and lateral extent of subsurface materials may be encountered during construction that significantly impact construction schedules, methods and material volumes. While higher levels of subsurface exploration can mitigate the risk of encountering unanticipated subsurface conditions, no level of subsurface exploration can eliminate this risk.

Scope of Geotechnical Services

Professional geotechnical engineering judgment is required to develop a geotechnical exploration scope to obtain information necessary to support design and construction. A number of unique project factors are considered in developing the scope of geotechnical services, such as the exploration objective; the location, type, size and weight of the proposed structure; proposed site grades and improvements; the construction schedule and sequence; and the site geology.

Geotechnical engineers apply their experience with construction methods, subsurface conditions and exploration methods to develop the exploration scope. The scope of each exploration is unique based on available project and site information. Incomplete project information or constraints on the scope of exploration increases the risk of variations in subsurface conditions not being identified and addressed in the geotechnical report.

Services Are Performed for Specific Projects

Because the scope of each geotechnical exploration is unique, each geotechnical report is unique. Subsurface conditions are explored and recommendations are made for a specific project.

Subsurface information and recommendations may not be adequate for other uses. Changes in a proposed structure location, foundation loads, grades, schedule, etc. may require additional geotechnical exploration, analyses, and consultation. The geotechnical engineer should be consulted to determine if additional services are required in response to changes in proposed construction, location, loads, grades, schedule, etc.

Geo-Environmental Issues

The equipment, techniques, and personnel used to perform a geo-environmental study differ significantly from those used for a geotechnical exploration. Indications of environmental contamination may be encountered incidental to performance of a geotechnical exploration but go unrecognized. Determination of the presence, type or extent of environmental contamination is beyond the scope of a geotechnical exploration.

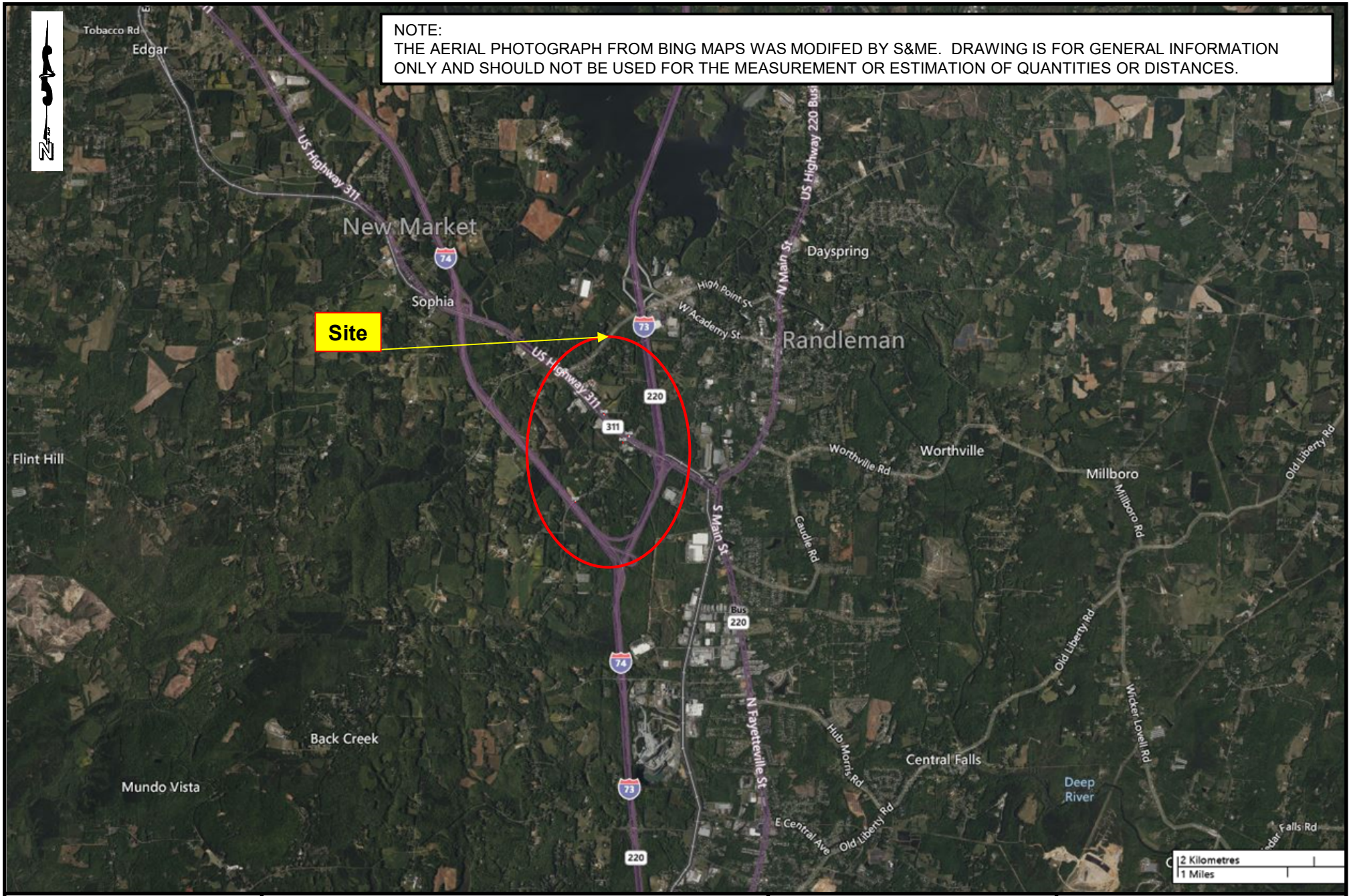
Geotechnical Recommendations Are Not Final

Recommendations are developed based on the geotechnical engineer's understanding of the proposed construction and professional opinion of site subsurface conditions. Observations and tests must be performed during construction to confirm subsurface conditions exposed by construction excavations are consistent with those assumed in development of recommendations. It is advisable to retain the geotechnical engineer that performed the exploration and developed the geotechnical recommendations to conduct tests and observations during construction. This may reduce the risk that variations in subsurface conditions will not be addressed as recommended in the geotechnical report.

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Appendices

Appendix I – Figures



Site Vicinity Plan

PTRWA Water Line
Randleman, Randolph County, North Carolina

JOB NO.: 23580335	FIGURE NO.: 1
SOURCE: OpenGround/Bing Maps	DRAWN BY: SAB
DATE: December 2024	CHECKED BY: SWL

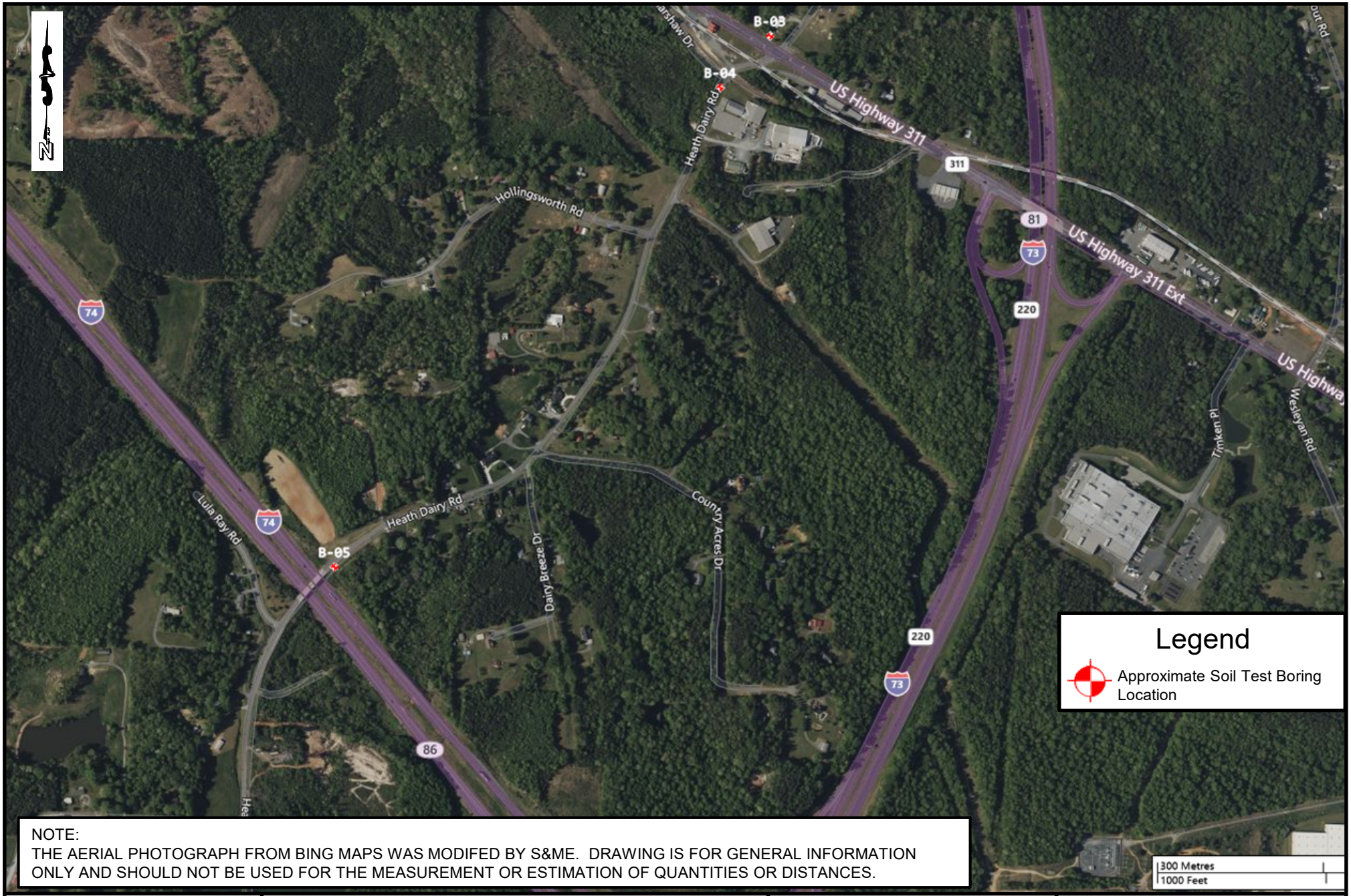


NOTE:
THE AERIAL PHOTOGRAPH FROM BING MAPS WAS MODIFED BY S&ME. DRAWING IS FOR GENERAL INFORMATION ONLY AND SHOULD NOT BE USED FOR THE MEASUREMENT OR ESTIMATION OF QUANTITIES OR DISTANCES.

Boring Location Plan

PTRWA Water Line
Randleman, Randolph County, North Carolina

JOB NO.: 23580335	FIGURE NO.: 2A
SOURCE: OpenGround/Bing Maps	DRAWN BY: SAB
DATE: December 2024	CHECKED BY: SWL

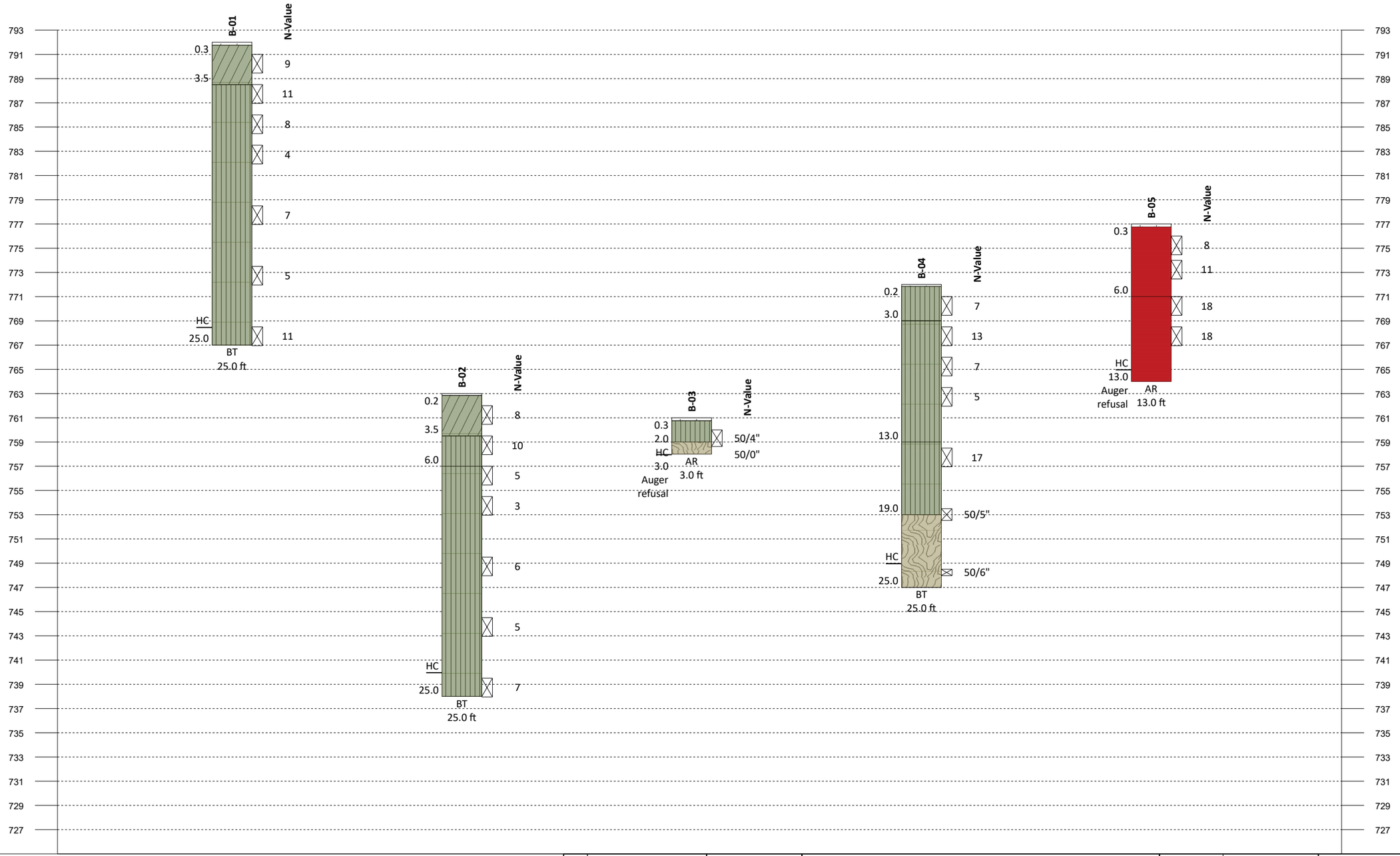


NOTE:
THE AERIAL PHOTOGRAPH FROM BING MAPS WAS MODIFED BY S&ME. DRAWING IS FOR GENERAL INFORMATION ONLY AND SHOULD NOT BE USED FOR THE MEASUREMENT OR ESTIMATION OF QUANTITIES OR DISTANCES.

Boring Location Plan

PTRWA Water Line
Randleman, Randolph County, North Carolina

JOB NO.: 23580335	FIGURE NO.: 2B
SOURCE: OpenGround/Bing Maps	DRAWN BY: SAB
DATE: December 2024	CHECKED BY: SWL



The depicted stratigraphy is shown for illustrative purposes only and is not warranted. Separations between different strata may be gradual and likely vary considerably from those shown. Profiles between nearby borings have been estimated using reasonable engineering care and judgement. The actual subsurface conditions will vary between boring locations.

"AR" = Auger Refusal, "BT = Boring Termination

▽	AT TIME OF DRILLING
▼	END OF DRILLING
▼	AFTER DRILLING

Generalized Subsurface Profile

PTRWA Water Line
Randleman, North Carolina

SCALE:	Not to scale
DATE:	Dec 18, 2024
PROJECT NUMBER:	23580335

FIGURE NO.

3

Appendix II – Boring Information

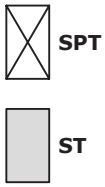
SOIL LOG LEGEND

SOIL PROPERTY SYMBOLS

N - Standard Penetration, bpf
LL - Liquid Limit, %
PPV - Pocket Penetrometer Value, tsf
NMC - Natural Moisture Content, %
PL - Plastic Limit, %
Qu - Unconfined Compressive Strength
F - Fines Content, %
PI - Plasticity Index, %
γd - Dry Unit Weight, pcf

The STANDARD PENETRATION TEST (SPT) as defined by ASTM D1586 (or AASHTO T206) is a method to obtain a disturbed soil sample for examination and testing and to obtain relative density and consistency information. A standard 1.4-inch I.D./2-inch O.D. split-barrel sampler is driven three 6-inch increments with a 140 lb. hammer freely falling 30 inches. The hammer can either be of a trip, free-fall design, or actuated by a rope and cathead. The SPT N Value is determined by adding the number of blows from the 2nd and 3rd 6-inch increments. A normalized blowcount (N_{60}) may be determined by the following equation: N_{60} = [Rig Energy Ratio (%) / 60] * N.

SHELBY TUBE (ST) samples are obtained by hydraulically pushing a thin-walled tube (typically 3-inches in diameter) to obtain a relatively undisturbed sample for testing of fine-grained soils to determine engineering properties such as strength, compressibility, permeability, and density. Shelby tubes are sampled in general accordance with ASTM D1587 (AASHTO T207).



Descriptive Order of Soil Strata: Geologic Disposition (i.e., Fill, Colluvium, Alluvium, etc.), ASTM Group Name (ASTM Group Symbol), quantified/qualified soil constituents, misc. constituents, consistency/density, color, organic description, moisture. ASTM group classifications is determined per ASTM D2487 where lab testing has been performed and ASTM D2488 where lab testing has not been performed.

ASTM GROUP NAME (SYMBOL) AND GRAPHIC

- WELL GRADED GRAVEL (GW)
- POORLY GRADED GRAVEL (GP)
- WELL GRADED GRAVEL WITH SILT (GW-GM)
- WELL GRADED GRAVEL WITH CLAY (GW-GC)
- POORLY GRADED GRAVEL WITH SILT (GP-GM)
- POORLY GRADED GRAVEL WITH CLAY (GP-GC)
- SILTY GRAVEL (GM)
- CLAYEY GRAVEL (GC)
- CLAYEY GRAVEL WITH SILT (GC-GM)
- WELL GRADED SAND (SW)
- POORLY GRADED SAND (SP)
- WELL GRADED SAND WITH SILT (SW-SM)
- WELL GRADED SAND WITH CLAY (SW-SC)
- POORLY GRADED SAND WITH SILT (SP-SM)
- POORLY GRADED SAND WITH CLAY (SP-SC)
- SILTY SAND (SM)
- CLAYEY SAND (SC)
- CLAYEY SAND WITH SILT (SC-SM)
- LEAN CLAY (CL)
- SILTY CLAY (CL-ML)
- SILT (ML)
- FAT CLAY (CH)
- ELASTIC SILT (MH)
- ORGANIC LOW PLASTICITY SILT OR CLAY (OL)
- ORGANIC HIGH PLASTICITY SILT OR CLAY (OH)
- PEAT (PT)
- TOPSOIL
- ASPHALT
- BASE - CEMENT MODIFIED
- BASE - CEMENT STABILIZED AGGREGATE
- BASE - GRAVEL
- CONCRETE
- VOID / NO RECOVERY
- IGM / PWR

FINE-GRAINED SOIL (Relative Consistency)

	N	PPV
Very Soft	< 2 bpf	< 0.25 tsf
Soft	2 - 4 bpf	> 0.25 - 0.5 tsf
Firm	5 - 8 bpf	> 0.5 - 1.0 tsf
Stiff	9 - 15 bpf	> 1.0 - 2.0 tsf
Very Stiff	16 - 30 bpf	> 2.0 - 4.0 tsf
Hard	> 30 bpf	> 4.0 tsf

COARSE-GRAINED SOIL (Relative Density)

	N
Very Loose	< 5 bpf
Loose	5 - 10 bpf
Medium Dense	11 - 30 bpf
Dense	31 - 50 bpf
Very Dense	> 50 bpf

MINOR CONSTITUENTS (% By Weight)

	Percentage
Trace	0% - 10%
Little	11% - 20%
Some	21% - 35%
"And"	≥ 36%

ORGANIC CONTENT OF SOIL (Determined by ASTM D2974 or AASHTO T267)

Classification	Percentage
With Organic Matter	4% - 15%
Organic Soil	16% - 30%
Peat	> 30%

MOISTURE CONDITION

Dry	Absense of moisture, dusty, dry to touch
Moist	Damp but no visible water
Wet	Visible free water, usually soil is below water table

At Time of Drilling (ATD) — Groundwater observation made anytime during the drilling process. Depending on time of reading and drilling methodologies, this value may be influenced by the drilling process.

End of Drilling — Groundwater measurement soon after the drilling processes are complete, and the borehole is at final depth. Drilling fluids, if introduced during drilling, may influence this measurement.

After Drilling — Groundwater measurements made in a borehole hours to days after drilling is complete. Depending on subsurface conditions, elapsed time, drilling process, etc. this observation may reflect a stabilized level.

REFERENCES:

FHWA NHI-16-072, Geotechnical Engineering Circular No. 5 "Geotechnical Site Characterization"
ASTM Specifications D2487 and D2488
DOT Specifications & Design Manuals from NC, SC, OH, MI, IN, PA, VA.

PROJECT:	PTRWA Water Line Randleman, North Carolina S&ME Project No. 23580335	BORING LOG: B-01 *Sheet 1 of 1*

DATE DRILLED: 11/08/2024	**ELEVATION:** 792 ft	**NOTES:** Borings located in the field using hand held GPS device. Elevations estimated from Wooten waterline profile drawings dated 9/18/24 and should be considered approximate.
DRILL RIG: CME-750 (Track)	**DATUM:** NAVD88	
DRILLER: S&ME, Inc.	**BORING DEPTH:** 25.0 ft	
HAMMER TYPE: Automatic hammer	**CLOSURE:** Cuttings with Hole Closure Device	
DRILLING METHOD: 3-1/4" HSA	**LOGGED BY:** Shaun Brewer	**LATITUDE:** 35.813332 **LONGITUDE:** -79.838112
SAMPLING METHOD: SS	**PROJECT COORDINATE SYSTEM -** NAD 1983 StatePlane North Carolina FIPS 3200 Feet	

DEPTH (feet)	NOTES	Origin/Identifier	GRAPHIC	SAMPLE NO. (RECOVERY)	MATERIAL DESCRIPTION	BLOW COUNT DATA (SPT N-value)	STANDARD PENETRATION TEST DATA (△ % Fines, ○ NMC, ⊢ PL---LL; 20 40 60 80 100)	ELEVATION
0								792
	0.3				TOPSOIL, 3 inches			
				SS-1	LEAN CLAY (CL), stiff, orange tan, fine grained, dry, with silt	2-4-5 N = 9	●	
	3.5							
				SS-2	SANDY SILT (ML), soft to stiff, orange black, moist	5-5-6 N = 11	●	
5								787
				SS-3		3-4-4 N = 8	● ⊢○⊣ △	
				SS-4		2-2-2 N = 4	●	
10		Residuum						782
				SS-5		2-3-4 N = 7	●	
15								777
				SS-6		2-2-3 N = 5	●	
20								772
	Hole caved at 23.5 feet			SS-7		2-3-8 N = 11	●	
25	25.0				Borehole terminated at 25.0 feet			767
30								762

GROUNDWATER		DATE	DEPTH (FT)	REMARKS
ATD	▽			
END OF DRILLING	▼	11/08/2024		Dry
AFTER DRILLING	▼			
AFTER DRILLING	▼			

GROUNDWATER DEPTHS ARE NOT EXACT AND MAY VARY SUBSTANTIALLY FROM THOSE INDICATED. ATD = AT TIME OF DRILLING
LL=Liquid Limit, PL = Plastic Limit, NMC = Natural Moisture Content, PPV = Pocket Penetrometer (tsf), PTV = Pocket Torvane (tsf), AR = Auger Refusal, IGM = Intermediate Geomaterial

PROJECT:	PTRWA Water Line Randleman, North Carolina S&ME Project No. 23580335	BORING LOG: B-02 *Sheet 1 of 1*

DATE DRILLED: 11/08/2024	**ELEVATION:** 763 ft	**NOTES:** Borings located in the field using hand held GPS device. Elevations estimated from Wooten waterline profile drawings dated 9/18/24 and should be considered approximate.
DRILL RIG: CME-750 (Track)	**DATUM:** NAVD88	
DRILLER: S&ME, Inc.	**BORING DEPTH:** 25.0 ft	
HAMMER TYPE: Automatic hammer	**CLOSURE:** Cuttings with Hole Closure Device	
DRILLING METHOD: 3-1/4" HSA	**LOGGED BY:** Shaun Brewer	**LATITUDE:** 35.807799 **LONGITUDE:** -79.831572
SAMPLING METHOD: SS	**PROJECT COORDINATE SYSTEM -** NAD 1983 StatePlane North Carolina FIPS 3200 Feet	

DEPTH (feet)	NOTES	Origin/Identifier	GRAPHIC	SAMPLE NO. (RECOVERY)	MATERIAL DESCRIPTION	BLOW COUNT DATA (SPT N-value)	STANDARD PENETRATION TEST DATA (△ % Fines, ○ NMC, ⊢ PL---LL; 20 40 60 80 100)	ELEVATION
0								763
	0.2				TOPSOIL, 2 inches			
				SS-1	LEAN CLAY (CL), firm, red, fine grained, moist, with silt	2-3-5 N = 8	●	
	3.5							
5				SS-2	SANDY SILT (ML), stiff, red orange, fine grained, moist, with clay	2-5-5 N = 10	●	758
	6.0							
				SS-3	SANDY SILT (ML), soft to firm, brown orange black, fine grained, moist	2-2-3 N = 5	●	
				SS-4		1-1-2 N = 3	●	
10		Residuum						753
				SS-5		1-2-4 N = 6	●	
15								748
				SS-6		1-2-3 N = 5	●	
20								743
	Hole caved at 23.0 feet							
				SS-7		2-3-4 N = 7	●	
25	25.0				Borehole terminated at 25.0 feet			738
30								733

GROUNDWATER		DATE	DEPTH (FT)	REMARKS
ATD	▽			
END OF DRILLING	▼	11/08/2024		Dry
AFTER DRILLING	▼			
AFTER DRILLING	▼			

GROUNDWATER DEPTHS ARE NOT EXACT AND MAY VARY SUBSTANTIALLY FROM THOSE INDICATED. ATD = AT TIME OF DRILLING
LL=Liquid Limit, PL = Plastic Limit, NMC = Natural Moisture Content, PPV = Pocket Penetrometer (tsf), PTV = Pocket Torvane (tsf), AR = Auger Refusal, IGM = Intermediate Geomaterial

PROJECT:	PTRWA Water Line Randleman, North Carolina S&ME Project No. 23580335	BORING LOG: B-03 *Sheet 1 of 1*
DATE DRILLED: 11/08/2024	**ELEVATION:** 761 ft	**NOTES:** Borings located in the field using hand held GPS device. Elevations estimated from Wooten waterline profile drawings dated 9/18/24 and should be considered approximate.
DRILL RIG: CME-750 (Track)	**DATUM:** NAVD88	
DRILLER: S&ME, Inc.	**BORING DEPTH:** 3.0 ft	
HAMMER TYPE: Automatic hammer	**CLOSURE:** Cuttings with Hole Closure Device	
DRILLING METHOD: 3-1/4" HSA	**LOGGED BY:** Shaun Brewer	**LATITUDE:** 35.804943 **LONGITUDE:** -79.827531
SAMPLING METHOD: SS	**PROJECT COORDINATE SYSTEM -** NAD 1983 StatePlane North Carolina FIPS 3200 Feet	

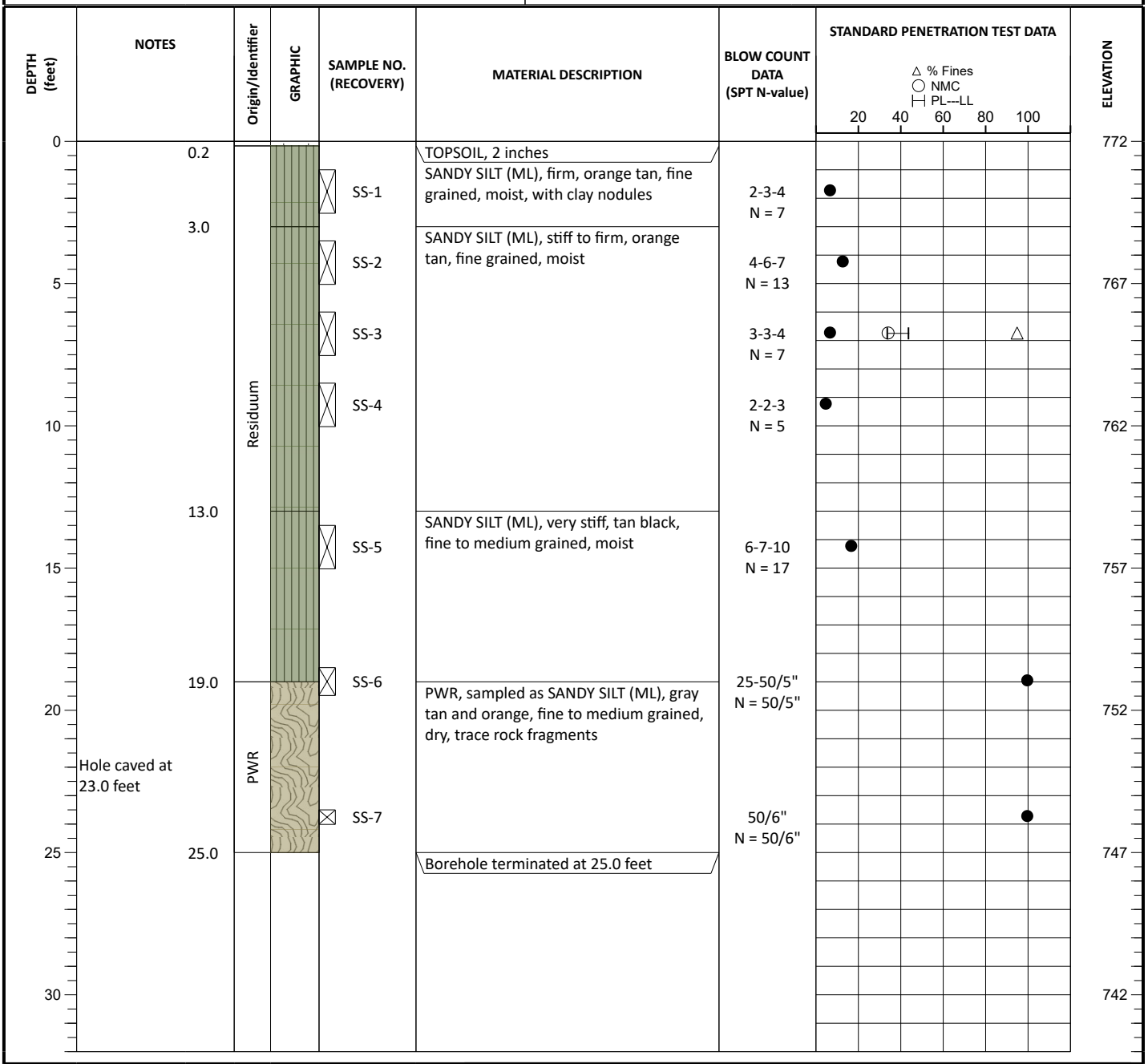
DEPTH (feet)	NOTES	Origin/Identifier	GRAPHIC	SAMPLE NO. (RECOVERY)	MATERIAL DESCRIPTION	BLOW COUNT DATA (SPT N-value)	STANDARD PENETRATION TEST DATA (△ % Fines, ○ NMC, ⊢ PL---LL; 20 40 60 80 100)	ELEVATION
0								761
	0.3	Residuum		SS-1	TOPSOIL, 3 inches SANDY SILT (ML), stiff to very stiff, tan, fine to medium grained, dry, trace organics	3-12-50/4" N = 50/4"		
	Auger refusal at 3.0 feet Hole caved at 3.0 feet 2.0							
	3.0	PWR		SS-2	PWR, sampled as SANDY SILT (ML), tan, dry Borehole terminated at 3.0 feet	50/0" N = 50/0"		
5								756
10								751
15								746
20								741
25								736
30								731

GROUNDWATER		DATE	DEPTH (FT)	REMARKS
ATD	▽			
END OF DRILLING	▼	11/08/2024		Dry
AFTER DRILLING	▼			
AFTER DRILLING	▼			

GROUNDWATER DEPTHS ARE NOT EXACT AND MAY VARY SUBSTANTIALLY FROM THOSE INDICATED. ATD = AT TIME OF DRILLING
LL=Liquid Limit, PL = Plastic Limit, NMC = Natural Moisture Content, PPV = Pocket Penetrometer (tsf), PTV = Pocket Torvane (tsf), AR = Auger Refusal, IGM = Intermediate Geomaterial

PROJECT:	PTRWA Water Line Randleman, North Carolina S&ME Project No. 23580335	BORING LOG: B-04 *Sheet 1 of 1*

DATE DRILLED: 11/08/2024	**ELEVATION:** 772 ft	**NOTES:** Borings located in the field using hand held GPS device. Elevations estimated from Wooten waterline profile drawings dated 9/18/24 and should be considered approximate.
DRILL RIG: CME-750 (Track)	**DATUM:** NAVD88	
DRILLER: S&ME, Inc.	**BORING DEPTH:** 25.0 ft	
HAMMER TYPE: Automatic hammer	**CLOSURE:** Cuttings with Hole Closure Device	
DRILLING METHOD: 3-1/4" HSA	**LOGGED BY:** Shaun Brewer	**LATITUDE:** 35.804098 **LONGITUDE:** -79.828533
SAMPLING METHOD: SS	**PROJECT COORDINATE SYSTEM -** NAD 1983 StatePlane North Carolina FIPS 3200 Feet	



GROUNDWATER		DATE	DEPTH (FT)	REMARKS
ATD	▽			
END OF DRILLING	▼	11/08/2024		Dry
AFTER DRILLING	▼			
AFTER DRILLING	▼			

GROUNDWATER DEPTHS ARE NOT EXACT AND MAY VARY SUBSTANTIALLY FROM THOSE INDICATED. ATD = AT TIME OF DRILLING
LL=Liquid Limit, PL = Plastic Limit, NMC = Natural Moisture Content, PPV = Pocket Penetrometer (tsf), PTV = Pocket Torvane (tsf), AR = Auger Refusal, IGM = Intermediate Geomaterial

PROJECT:	PTRWA Water Line Randleman, North Carolina S&ME Project No. 23580335	BORING LOG: B-05 *Sheet 1 of 1*
DATE DRILLED: 11/08/2024	**ELEVATION:** 777 ft	**NOTES:** Borings located in the field using hand held GPS device. Elevations estimated from Wooten waterline profile drawings dated 9/18/24 and should be considered approximate.
DRILL RIG: CME-750 (Track)	**DATUM:** NAVD88	
DRILLER: S&ME, Inc.	**BORING DEPTH:** 13.0 ft	
HAMMER TYPE: Automatic hammer	**CLOSURE:** Cuttings with Hole Closure Device	
DRILLING METHOD: 3-1/4" HSA	**LOGGED BY:** Shaun Brewer	**LATITUDE:** 35.796262 **LONGITUDE:** -79.836271
SAMPLING METHOD: SS	**PROJECT COORDINATE SYSTEM -** NAD 1983 StatePlane North Carolina FIPS 3200 Feet	

DEPTH (feet)	NOTES	Origin/Identifier	GRAPHIC	SAMPLE NO. (RECOVERY)	MATERIAL DESCRIPTION	BLOW COUNT DATA (SPT N-value)	STANDARD PENETRATION TEST DATA (△ % Fines, ○ NMC, ⊢ PL---LL; 20 40 60 80 100)	ELEVATION
0					TOPSOIL, 3 inches			777
0.3				SS-1	SANDY SILT (ML), firm, tan gray, fine to coarse grained, moist, trace rock fragments, trace organics	2-3-5 N = 8	●	
				SS-2		3-4-7 N = 11	●	
5								772
6.0		Fill		SS-3	LEAN CLAY (CL), very stiff, orange brown and gray, moist, with silk, trace organics, mottled	5-7-11 N = 18	●	
				SS-4		6-9-9 N = 18	●	
10	Hole caved at 12.0 feet Auger refusal at 13.0 feet							767
13.0					Borehole terminated at 13.0 feet			
15								762
20								757
25								752
30								747

GROUNDWATER		DATE	DEPTH (FT)	REMARKS
ATD	▽			
END OF DRILLING	▼	11/08/2024		Dry
AFTER DRILLING	▼			
AFTER DRILLING	▼			

GROUNDWATER DEPTHS ARE NOT EXACT AND MAY VARY SUBSTANTIALLY FROM THOSE INDICATED. ATD = AT TIME OF DRILLING
LL=Liquid Limit, PL = Plastic Limit, NMC = Natural Moisture Content, PPV = Pocket Penetrometer (tsf), PTV = Pocket Torvane (tsf), AR = Auger Refusal, IGM = Intermediate Geomaterial

Appendix III – Laboratory Information

SUMMARY OF LABORATORY TEST DATA

PTRWA Water Line
Randleman, North Carolina
S&ME Project No. 23580335

Boring	Sample Depth (feet)	Sample Type	USCS Classification	Natural Moisture Content (%)	Grain Size Analysis			Atterberg Limits		
					Gravel (%)	Sand (%)	Silt and Clay (%)	LL	PL	PI
B-01	6-7.5	SS	ML	31.0	0	5	95	43	32	11
B-04	6-7.5	SS	ML	34.2	0	5	95	44	34	10

* - Visual/manual classification
SS - Split Spoon

LL - Liquid Limit
PL - Plastic Limit
PI - Plasticity Index
NP - Non-plastic

Form No: TR-D2216-T265-1
Revision No. 1
Revision Date: 08/16/17

LABORATORY DETERMINATION OF WATER CONTENT

ASTM D 2216 ☑ *AASHTO T 265* ☐

S&ME, Inc. Greensboro: 8646 West Market Street, Suite 105, Greensboro, NC 27409

Project #:	23580335	Report Date:	11-21-24
Project Name:	PTRWA Water Line	Test Date(s):	10-31-24
Client Name:	The Wooten Company		
Client Address:	119 Brookstown Avenue, Suite 100, Winston Salem NC		
Sample by:	S&ME	Sample Date(s):	11-8-24
Sampling Method:	NA	Drill Rig :	NA

Method: **A (1%)** ☐ **B (0.1%)** ☑ Balance ID. 5544 Calibration Date: 1-10-24 Oven ID. 5470 Calibration Date: 12-2-23

Boring No.	Sample No.	Sample Depth	Tare #	Tare Weight	Tare Wt.+ Wet Wt	Tare Wt. + Dry Wt	Water Weight	Percent Moisture	Note
		ft. or m.		grams	grams	grams	grams	%	
B-01	3	6-7.5	S-40	0.00	222.00	169.50	52.50	31.0%	
B-04	3	6-7.5	S-11	0.00	226.30	168.60	57.70	34.2%	

Notes / Deviations / References Delete one of the references under Procedure.

ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass

Jimmy Thomasson		NICET 119392	
Technician Name	*Signature*	*Certification Type / No.*	*Date*
Steve Lacz, PE		Project Manager	
Technical Responsibility	*Signature*	*Position*	*Date*

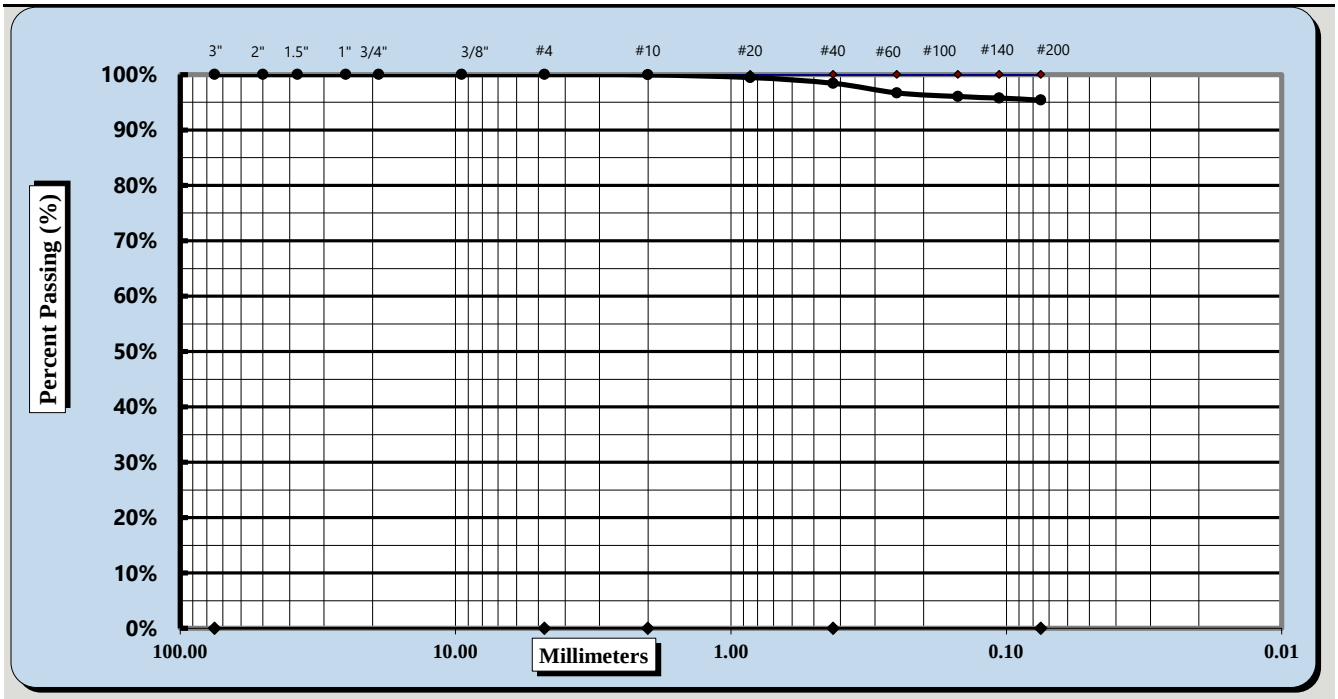
Form No TR-D6913-GR-01
Revision No. 1
Revision Date: 9/5/17

SIEVE ANALYSIS OF SOIL

Single sieve set ASTM D6913

S&ME, Inc. Greensboro: 8646 West Market Street, Suite 105, Greensboro, NC 27409

Project #:	23580335	Record Date:	11/21/2024
Project Name:	PTRWA Water Line	Lab Report #:	
Client Name:	The Wooten Company	Date Received:	11/12/2024
Received By:	J Thomasson	Sampled by: S&ME	Date Sampled: 11/8/2024
Location:	B-01		
Log/Sample Id.	3	Type: Ziplock bag	Elev/Depth: 6-7.5'
Sample Description:	Red Tan SILT		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Method: A Procedure for obtaining Specimen: Moist Dispersion Process: Soaked w/o Dispersant

Maximum Particle Size	#4	Coarse Sand	0%	Fine Sand	3%
Gravel	0%	Medium Sand	2%	Silt & Clay	95%
Liquid Limit		Plastic Limit		Plastic Index	
Maximum Dry Density		Bulk Gravity (C127)	--	% Absorption	--
Optimum Moisture		Natural Moisture		CBR	--

Notes / Deviations / References:

Steve Lacz, PE — *Technical Responsibility*
Signature
Project Manager — *Position*
Date

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

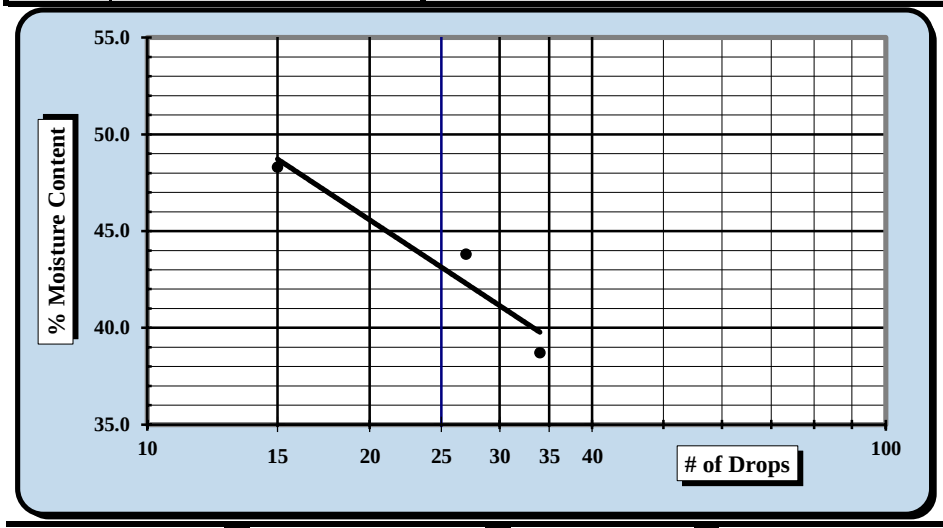
S&ME, Inc. Greensboro: 8646 West Market Street, Suite 105, Greensboro, NC 27409

Project #:	23580335	Report Date:	11-21-24
Project Name:	PTRWA Water Line	Test Date(s)	11-20-24
Client Name:	The Wooten Company		
Client Address:	119 Brookstown Avenue, Suite 100, Winston Salem NC		

Boring #:	B-01	Sample #:	3	Sample Date:	11-8-24
Location:	NA	Offset:	NA	Elevation:	6-7.5'
Sample Description:	Red Tan SILT				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	5544	1/10/2024	Grooving tool	35190	4/15/2024
LL Apparatus	35189	4/15/2024	Grooving tool		
Oven	5470	12/2/2023	Grooving tool		

	Pan #							Plastic Limit		
	Tare #:	10	20	28				117	120	
A	Tare Weight	15.97	15.86	14.27				11.58	11.45	
B	Wet Soil Weight + A	25.54	24.07	23.17				17.25	17.53	
C	Dry Soil Weight + A	22.87	21.57	20.27				15.90	16.05	
D	Water Weight (B-C)	2.67	2.50	2.90				1.35	1.48	
E	Dry Soil Weight (C-A)	6.90	5.71	6.00				4.32	4.60	
F	% Moisture (D/E)*100	38.7%	43.8%	48.3%				31.3%	32.2%	
N	# OF DROPS	34	27	15				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**31.8%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**43**
Plastic Limit	**32**
Plastic Index	**11**
Group Symbol	**ML**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☐

Notes / Deviations / References:

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Jimmy Thomasson — *Technician Name* — *Date*

Steve Lacz, PE — *Technical Responsibility* — *Date*

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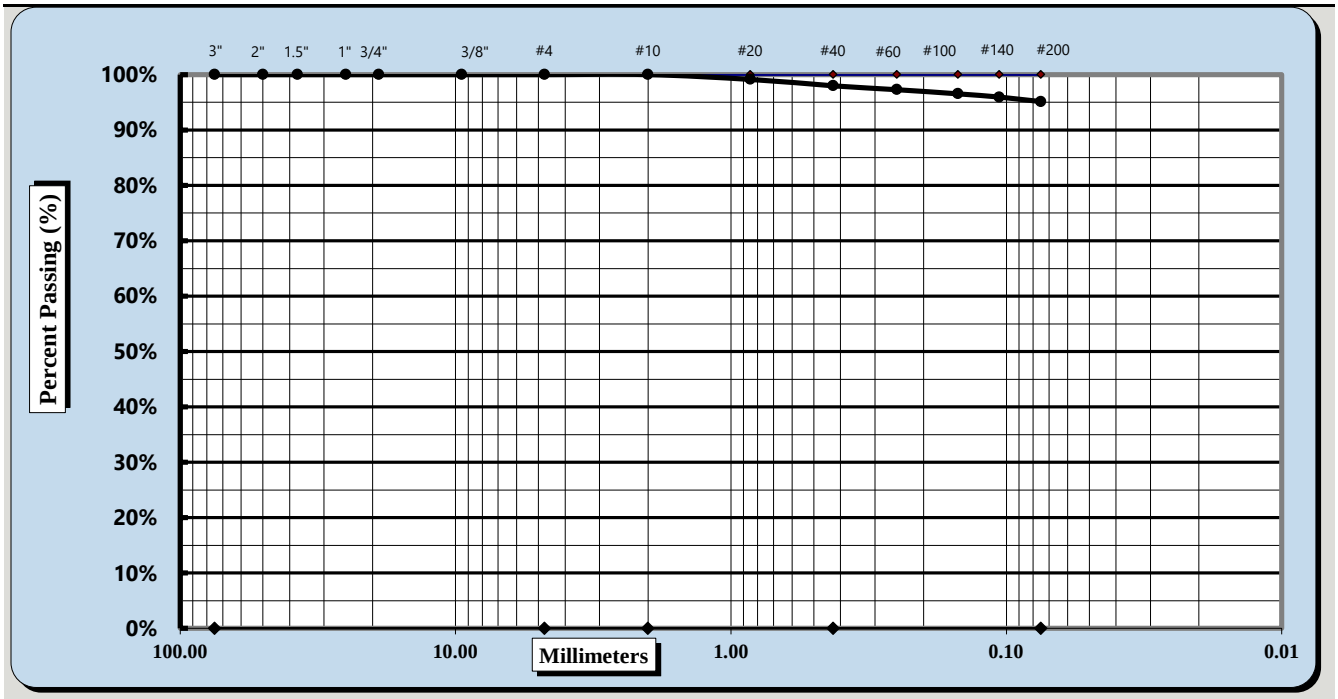
Form No TR-D6913-GR-01
Revision No. 1
Revision Date: 9/5/17

SIEVE ANALYSIS OF SOIL

Single sieve set ASTM D6913

S&ME, Inc. Greensboro: 8646 West Market Street, Suite 105, Greensboro, NC 27409

Project #:	23580335	Record Date:	11/21/2024
Project Name:	PTRWA Water Line	Lab Report #:	
Client Name:	The Wooten Company	Date Received:	11/12/2024
Received By:	J Thomasson	Sampled by: S&ME	Date Sampled: 11/8/2024
Location:	B-04		
Log/Sample Id.	3	Type: Ziplock bag	Elev/Depth: 6-7.5'
Sample Description:	Red Tan SILT		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Method: A Procedure for obtaining Specimen: Moist Dispersion Process: Soaked w/o Dispersant

Maximum Particle Size	#4	Coarse Sand	0%	Fine Sand	3%
Gravel	0%	Medium Sand	2%	Silt & Clay	95%
Liquid Limit		Plastic Limit		Plastic Index	
Maximum Dry Density		Bulk Gravity (C127)	--	% Absorption	--
Optimum Moisture		Natural Moisture		CBR	--

Notes / Deviations / References:

Steve Lacz, PE — *Technical Responsibility*
Signature
Project Manager — *Position*
Date

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Form No. TR-D4318-T89-90
Revision No. 1
Revision Date: 7/26/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

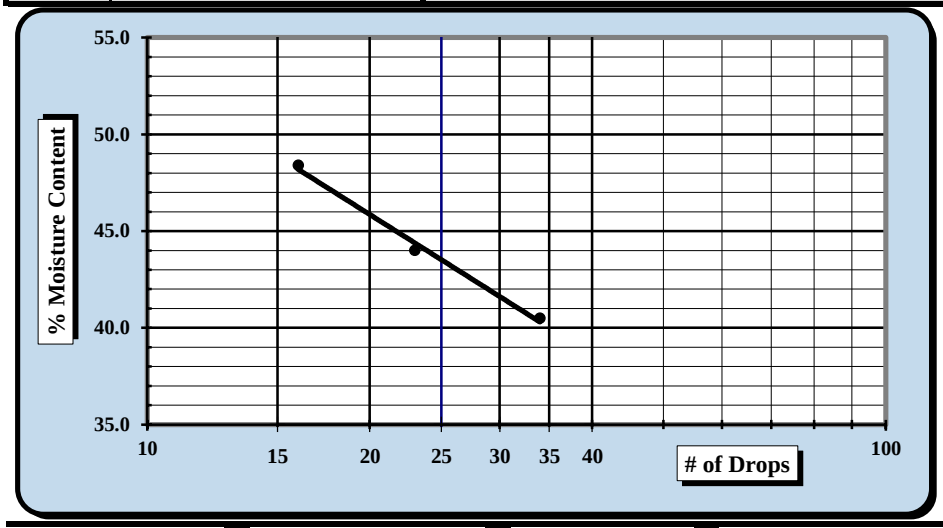
S&ME, Inc. Greensboro: 8646 West Market Street, Suite 105, Greensboro, NC 27409

Project #:	23580335	Report Date:	11-21-24
Project Name:	PTRWA Water Line	Test Date(s)	11-20-24
Client Name:	The Wooten Company		
Client Address:	119 Brookstown Avenue, Suite 100, Winston Salem NC		

Boring #:	B-04	Sample #:	3	Sample Date:	11-8-24
Location:	NA	Offset:	NA	Elevation:	6-7.5'
Sample Description:	Red Tan SILT				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	5544	1/10/2024	Grooving tool	35190	4/15/2024
LL Apparatus	35189	4/15/2024	Grooving tool		
Oven	5470	12/2/2023	Grooving tool		

	Pan #							Plastic Limit		
	Tare #:	13	15	122				124	103	
A	Tare Weight	13.92	15.84	11.40				11.43	11.28	
B	Wet Soil Weight + A	24.47	24.41	22.65				20.06	18.73	
C	Dry Soil Weight + A	21.43	21.79	18.98				17.87	16.82	
D	Water Weight (B-C)	3.04	2.62	3.67				2.19	1.91	
E	Dry Soil Weight (C-A)	7.51	5.95	7.58				6.44	5.54	
F	% Moisture (D/E)*100	40.5%	44.0%	48.4%				34.0%	34.5%	
N	# OF DROPS	34	23	16				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**34.3%**		



One Point Liquid Limit			
N	**Factor**	**N**	**Factor**
20	0.974	26	1.005
21	0.979	27	1.009
22	0.985	28	1.014
23	0.99	29	1.018
24	0.995	30	1.022
25	1.000		

NP, Non-Plastic ☐

Liquid Limit	**44**
Plastic Limit	**34**
Plastic Index	**10**
Group Symbol	**ML**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☑ Air Dried ☐

Notes / Deviations / References:

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Jimmy Thomasson — *Technician Name* — *Date*
Steve Lacz, PE — *Technical Responsibility* — *Date*

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APPENDIX 2 - GENERAL RESTORATION PLAN

General Restoration Plan

Proposed Piedmont Triad Regional Water Authority Water Line Project
Randolph County, North Carolina
S&ME Project No. 23580335A

The proposed project has been designed to avoid and minimize jurisdictional impacts where practicable. As part of mitigation for unavoidable impacts, the following plan shall be implemented to restore temporarily-affected streams and wetland areas. This plan entails restoration of disturbed streambanks and wetland areas to their original contours and conditions to the degree practicable upon project completion. Unless otherwise authorized by the appropriate permits, no fills or spoils of any kind will be permanently placed along streambanks or within wetland areas. Further, disturbed streambanks will be permanently stabilized using coir matting (with no plastic or nylon) and native vegetative cover.

Proposed restoration activities will include the removal of placed fill material and restoration of original pre-disturbance contours. Excavated material shall be returned to the trench to the extent possible, and remaining excess material relocated and retained on an upland site. Excavated topsoil or streambed substrate will be stockpiled separately and then replaced uniformly over the area of excavation from which it was removed. The native seed mix identified in **Table 1** below will be utilized at wetlands and along temporarily-disturbed streambanks.

Table 1: Native North Carolina Piedmont Riparian Seed Mix

Scientific Name	Common Name	Percentage of Mix
Sorghastrum nutans	Indiangrass	29.9
Elymus virginicus	Virginia Wildrye	20.0
Panicum virgatum	Switchgrass	20.0
Panicum anceps	Beaked Panicgrass	10.0
Chasmanthium latifolium	River Oats	5.0
Panicum rigidulum	Redtop Panicgrass	5.0
Chamaecrista fasciculata	Partridge Pea	3.0
Carex vulpinoidea	Fox Sedge	2.0
Coreopsis lanceolata	Lanceleaf Coreopsis	2.0
Rudbeckia hirta	Blackeyed Susan	2.0
Juncus effusus	Soft Rush	0.5
Vernonia noveboracensis	New York Ironweed	0.4
Helianthus angustifolius	Narrowleaf Sunflower	0.2
TOTAL		**100**

Native seed mix is to be applied to the disturbed streambanks. The recommended application rate is 20 pounds per acre. To provide quicker cover, the mix specified in **Table 1** should also be augmented with the appropriate cover/companion species, as identified in **Table 2**.

Table 2: Cover/Companion Species

Scientific Name	Common Name	Season to Plant	Mix	Comments
Secale cereale	Grain Rye	September 1 to April 30	30 lbs. / acre	Grows three to four feet tall but not a strong a competitor.
Echinochloa esculenta	Japanese Millet	May 1 to August 31	10 lbs. / acre	Extremely tolerant of wet soils; has cold-climate tolerance; helps reduce weed growth; increases biomass production.

Substitutions to the native seed mix identified in this restoration plan may be made with prior approval. Any substitutions shall continue to consist of appropriate native species. Additional information related to restoration activities is included on the Typical Construction Details and Drawings. Note that in the event of a conflict, the specifications of the approved erosion and sediment control (E&SC) plan shall govern.

The native seed mix (ERNMX-307) can be obtained from:

Ernst Seeds
8884 Mercer Pike
Meadville, Pennsylvania 16335
1-800-873-3321
814-336-2404
sales@ernstseed.com