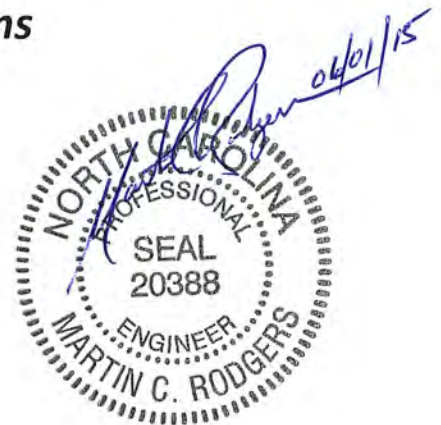




GREENVILLE UTILITIES COMMISSION
of
THE CITY OF GREENVILLE, NORTH CAROLINA
Request for Bids
for
GCP89
Northwestern Loop
High Pressure
Gas Main Extension
&
Two District Regulator Stations

Issued:
June 1, 2015

Due:
2:00 PM, June 25, 2015



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**REQUEST FOR BIDS
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Section A

Advertisement for Bids

ADVERTISEMENT FOR BIDS

by
Greenville Utilities Commission of the City of Greenville, NC
for
GCP89 – Northwestern Loop High-Pressure Gas Main Extension
Pitt County, North Carolina

Sealed Bids for **the Construction of a 3.2-mile, 6-inch steel, high-pressure natural gas main and two district regulator stations** will be received by the Greenville Utilities Commission in the Engineering Center Conference Room at 801 Mumford Road, P. O. Box 1847, Greenville, NC 27835 until 2:00 p.m. on **Thursday, June 25, 2015** and immediately thereafter publicly opened and read.

Bids must be enclosed in a sealed envelope, addressed to the Greenville Utilities Commission and the outside of the envelope must be marked **BID FOR GCP89 – NORTHWESTERN LOOP HIGH-PRESSURE GAS MAIN EXTENSION**. All Bids must include the information specified in the format specified in the Instructions to Bidders, and all Bids must be made on blank forms provided with and included in the bound document. The name, address, and license number of the Bidder must be plainly marked thereon. Oral or faxed Bids are invalid and will be rejected.

Each Bid submitted must be accompanied by cash or a certified check, drawn on a bank or trust company authorized to do business in North Carolina, payable to the Greenville Utilities Commission in an amount at least equal to five percent (5%) of the total amount of the Bid, as a guarantee that a contract will be entered into. In lieu of cash or a certified check, the Bidder may submit a bid bond in the form prescribed in G.S. 143-129 as amended by Chapter 1104 of the Public Laws of 1951.

Contractors are notified that legislative acts relating to licensing of contractors will be observed in receiving bids and awarding contracts. It is the Bidder's responsibility to ensure and to provide proof of compliance with all applicable licensing requirements.

A **Pre-Bid Conference** will be held at the Greenville Utilities Commission Engineering Center at 801 Mumford Road, Greenville, North Carolina 27835 on **Thursday, June 11, 2015, at 2:00 pm**, local time.

The major items of Work include:

- Constructing, testing, cleaning, drying, purging, and filling with gas a 3.2-mile, 6-inch steel, high-pressure natural gas pipeline;
- Constructing, testing, cleaning, purging, and filling with gas the NC Hwy 43 District Regulator Station;
- Constructing, testing, cleaning, purging, and filling with gas the Old River Road District Regulator Station;
- Tying in the district regulator stations to the Northwestern Loop High-Pressure Gas Main Extension and to the natural gas distribution system.

ADVERTISEMENT FOR BIDS

- Coordinating the tie-in procedures with Greenville Utilities Commission construction crews and with construction of the Old River Road Gas Main Extension to be constructed by Greenville Utilities Commission Crews.

The complete Bid Package will be posted and available at <http://www.guc.com/doing-business-with-us/> for download.

The right is reserved to reject any or all Bids, to waive informalities, and to award Contract or Contracts which, in the opinion of the Owner, appear to be in its best interest. The right is reserved to hold any or all Bids for a period of sixty (60) days from the opening thereof.

GREENVILLE UTILITIES COMMISSION
(Owner)

Mr. F. Durward Tyson, Jr., P.E.
(Gas Systems Engineer)

Rummel, Klepper and Kahl, LLP
2100 East Cary Street, Suite 309
Richmond, Virginia 23223
(804) 782-1903
(804) 782-2142 (FAX)

Section B

Background Information

INTRODUCTION AND PROJECT DESCRIPTION

The Greenville Utilities Commission (GUC) is requesting Bids for the construction, testing, and gas-up of the Northwestern Loop High Pressure Gas Main Extension and two district regulator stations. The proposed 6-inch API 5L GRB, 0.280-inch wall thickness, epoxy thin-film coated steel natural gas main is approximately 3.2 miles in length. The route of the proposed gas main begins at the Greenville Utilities Commission's Gate Station No.3 south of MacGregor Downs Road (NCSR 1202) and follows the electric power line to the north paralleling NC Hwy 264 Bypass across NC Hwy 43 and the Tar River, and terminates at Riverview Road (NCSR 1464) just south of Old River Road (NCSR 1401). Construction will be mostly within existing utility easements, new parallel easements and temporary work space easements. As designed, there are seven (7) horizontal directional drills (HDDs), one conventional bore without casing, and the remainder of the construction is designed to be performed by conventional means. The new gas main is to be hydrostatically tested to 840 psig for a maximum allowable operating pressure (MAOP) of 560 psig. The Greenville Utilities Commission intends to operate the main at 260 psig.

After crossing under NC Hwy 264 Bypass from east to west the new main will supply the proposed NC Hwy 43 district Regulator Station just north of NC Hwy 43. At the northern terminus of the new main, it will supply the proposed Old River Road District Regulator Station. The Work covered under this contract includes construction of both district regulator stations. The district regulator stations shall be tested with nitrogen.

The Contractor will be required to deliver a tested, cleaned, purged, and gassed-up pipeline and tested, cleaned, purged and gassed-up regulator stations. The Contractor shall make all tie-ins between the Northwestern Loop High Pressure Gas Main Extension and the district regulator stations and shall make all tie-ins from the regulator station outlet piping to the polyethylene (PE) natural gas distribution system. The Contractor shall coordinate the tie-in of the Old River Road District Regulator Station with the Greenville Utilities Commission construction crews that will be constructing the 6-inch PE Old River Road Gas Main Extension. The CONTRACTOR shall coordinate the tie-in to the existing 4-inch PE natural gas main along the north side of NC Hwy 43 with the Greenville Utilities Commission.

GENERAL REQUIREMENTS

Contractor's bidding on the Work must have a minimum of five (5) years of experience constructing steel natural gas mains and/or pipelines and regulator station facilities according to the requirements of Title 49, Part 192, and the project Plans and Specification. Contractor must have a minimum of five (5) years of experience in horizontal directional drilling with similar diameter steel pipe, preferable in the geological region of the project.

The Owner shall provide all materials listed in the Bill of Materials contained in the drawings. The Contractor shall provide all other materials and equipment required for construction of the pipeline, regulator stations and sites, fencing and asphalt paving; and for the restoration for the site following Construction.

SITE CONDITIONS

The terrain consists of gently rolling hills and low flat areas. There are wetlands, the Flood Way and the Flood Plain of the Tar River, the Tar River and several smaller streams; predominantly designed to be crossed by horizontal directional drilling. The existing power line right-of-way (ROW) is cleared and may require some brush cutting and removal for construction can begin. Some minor clearing of mature

growth and secondary growth timber will be required. The land surrounding the pipeline route and existing power line ROW is predominantly farmland or wooded. Depending on the season and the rainfall, the site can be expected to be wet with a high water table.

The site elevation is between approximately 80 feet above sea level (ASL) at the southern end of the gas main to approximately 3 feet below sea level at the bottom of the Tar River. The 100 year flood elevation at the site is 26.1 feet ASL.

INTENT TO BID

on the

Greenville Utilities Commission of the City of Greenville, NC

GCP89 – Northwestern Loop High Pressure Natural Gas Main Extension

Please submit the following information to the Greenville Utilities Commission one (1) week prior to the Pre-bid Meeting, scheduled for Thursday, June 11, 2015 at 2:00 pm at the Greenville Utilities Commission Engineering Center located at 801 Mumford Road, Greenville, NC 27835.

Submit your response to:

F. Durward Tyson, Jr., P.E.
Greenville Utilities Commission
801 Mumford Road
Greenville, North Carolina 27835
FAX: (252) 551-2048
Email: tysonfd@guc.com

Name:		Title:	
Organization:			
Address:			
City:		State:	Zip:
E-mail Address:		Phone No.: () -	
WEB Site:		FAX No.: () -	
Authorized Signature:			Date:

Please complete the following:

Indicate the number that will be attending the Pre-bid Meeting:

Section C

Instructions to Bidders

INSTRUCTIONS TO BIDDERS

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ARTICLE 1 – DEFINED TERMS

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

- A. *Issuing Office* – The office from which the Bidding Documents are to be issued and where the Bidding Procedures are to be administered.

**The Greenville Utilities Commission
Engineering Center
801 Mumford Road
Greenville, North Carolina 27835**

ARTICLE 2 – COPIES OF BIDDING DOCUMENTS

- 2.01 Complete sets of the Bidding Documents will be posted and may be obtained at:

<http://www.guc.com/doing-business-with-us/>

- 2.02 Complete sets of Bidding Documents shall be used in preparing Bids; neither Owner nor Engineer assumes any responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bidding Documents.
- 2.03 Owner and Engineer, in making copies of Bidding Documents available on the above terms, do so only for the purpose of obtaining Bids for the Work and do not authorize or confer a license for any other use.

ARTICLE 3 – QUALIFICATIONS OF BIDDERS

- 3.01 To demonstrate Bidder's qualifications to perform the Work, Bidder shall submit with Bid (a) written evidence establishing its qualifications such as financial data, previous experience, and present commitments, and (b) the following additional information:
- A. Each Proposal must contain evidence of Proposer's qualification to do business in North Carolina or covenant to obtain such qualifications prior to award of the Contract.
 - B. Each Proposal must contain evidence of the Proposer's North Carolina Contractor licensing required for this project.
 - C. Subcontractor qualification information; coordinate with provisions of Article 12 of these Instructions, "Subcontractors, Suppliers, and Others."
 - D. Proof of five (5) years of recent and current experience with similar natural gas main or pipeline projects constructed under the requirements of Title 49, Part 192, having similar sized steel pipe, and including horizontal directional drilling.
 - E. Minority and/or Women Business Enterprise Program
 - 1. Refer to SECTION D – Special Instructions to Bidders for the project MBE/WBE goals related requirements.
- 3.02 A Bidder's failure to submit required qualification information within the times indicated may disqualify Bidder from receiving an award of the Contract.

- 3.03 No requirement in this Article 3 to submit information will prejudice the right of Owner to seek additional pertinent information regarding Bidder's qualifications.
- 3.04 Bidder is advised to carefully review those portions of the Bid Form requiring Bidder's representations and certifications.
- 3.05 OPERATOR QUALIFICATIONS
 - A. Successful Bidder will be required to meet the Greenville Utilities Commission Operator Qualification requirements for all covered tasks included in the Work under this Contract.

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

4.01 *Site and Other Areas*

- A. The Site is identified in the Bidding Documents. By definition, the Site includes rights-of-way, easements, and other lands furnished by Owner for the use of the Contractor. Any additional lands required for temporary construction facilities, construction equipment, or storage of materials and equipment, and any access needed for such additional lands, are to be obtained and paid for by Contractor.
- B. See Plan Sheet G-2 for specific site requirements of the property owners resulting from easement and land purchase agreements.
- C. Status of easement and land acquisition is included in the Project Plans.

4.02 *Existing Site Conditions*

- A. Subsurface and Physical Conditions; Hazardous Environmental Conditions
 - 1. Geotechnical Baseline Report: The Bidding Documents contain a Geotechnical Baseline Report (GBR). The GBR describes certain select subsurface conditions that are anticipated to be encountered by Contractor during construction in specified locations ("Baseline Conditions"). The GBR is a Contract Document.

The Baseline Conditions in the GBR are intended to reduce uncertainty and the degree of contingency in submitted Bids. However, Bidders cannot rely solely on the Baseline Conditions. Bids should be based on a comprehensive approach that includes an independent review and analysis of the GBR, all other Contract Documents, Technical Data, other available information, and observable surface conditions. Not all potential subsurface conditions are baselined.

Nothing in the GBR is intended to relieve Bidders of the responsibility to make their own determinations regarding construction costs, bidding strategies, and Bid prices, nor of the responsibility to select and be responsible for the means, methods, techniques, sequences, and procedures of construction, and for safety precautions and programs incident thereto.

The GBR is included as **Exhibit P-1** of the Contract Documents. The title of the GBR is:

**The Geotechnical Data Report, US 264 HDD Crossings
Greenville, North Carolina
S&ME Project No. 1358-14-033
Prepared by S&ME, July 28, 2014**

- B. Underground Facilities: Information and data shown or indicated in the Bidding Documents with respect to existing Underground Facilities at or contiguous to the Site are set forth in the Contract Documents and are based upon information and data furnished to Owner and Engineer by owners of such Underground Facilities, including Owner, or others.
- C. Adequacy of Data: Provisions concerning responsibilities for the adequacy of data furnished to prospective Bidders with respect to subsurface conditions, other physical conditions, and Underground Facilities, and possible changes in the Bidding Documents due to differing or unanticipated subsurface or physical conditions appear in Paragraphs 5.03, 5.04, and 5.05 of the General Conditions. Provisions concerning responsibilities for the adequacy of data furnished to prospective Bidders with respect to a Hazardous Environmental Condition at the Site, if any, and possible changes in the Contract Documents due to any Hazardous Environmental Condition uncovered or revealed at the Site which was not shown or indicated in the Drawings or Specifications or identified in the Contract Documents to be within the scope of the Work, appear in Paragraph 5.06 of the General Conditions.

4.03 *Site Visit and Testing by Bidders*

- A. Bidder shall conduct the required Site visit following the Mandatory Pre-Bid Meeting and/or during normal working hours, and shall not disturb any ongoing operations at the Site.
- B. Bidder is not required to conduct any subsurface testing, or exhaustive investigations of Site conditions.
- C. On request, and to the extent Owner has control over the Site, and schedule permitting, the Owner will provide Bidder access to the Site to conduct such additional examinations, investigations, explorations, tests, and studies as Bidder deems necessary for preparing and submitting a successful Bid. Owner will not have any obligation to grant such access if doing so is not practical because of existing operations, security or safety concerns, or restraints on Owner's authority regarding the Site.
- D. Bidder shall comply with all applicable Laws and Regulations regarding excavation and location of utilities, obtain all permits not obtained as part of design, 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.

4.04 *Owner's Safety Program*

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

4.05 *Other Work at the Site*

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

ARTICLE 5 – BIDDER’S REPRESENTATIONS

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

- A. examine and carefully study the Bidding Documents, and any data and reference items identified in the Bidding Documents;
- B. visit the Site, conduct a thorough, alert visual examination of the Site and adjacent areas, and become familiar with and satisfy itself as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work;
- C. become familiar with and satisfy itself as to all Laws and Regulations that may affect cost, progress, and performance of the Work;
- D. carefully study all: (1) reports of explorations and tests of subsurface conditions at or adjacent to the Site and all drawings of physical conditions relating to existing surface or subsurface structures at the Site that have been identified in the Supplementary Conditions, especially with respect to Technical Data in such reports and drawings.
- E. consider the information known to Bidder itself; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Bidding Documents; and the Site-related reports and drawings identified in the Bidding Documents, with respect to the effect of such information, observations, and documents on (1) the cost, progress, and performance of the Work; (2) the means, methods, techniques, sequences, and procedures of construction to be employed by Bidder; and (3) Bidder’s safety precautions and programs;
- F. agree, based on the information and observations referred to in the preceding paragraph, that at the time of submitting its Bid no further examinations, investigations, explorations, tests, studies, or data are necessary for the determination of its Bid for performance of the Work at the price bid and within the times required, and in accordance with the other terms and conditions of the Bidding Documents;
- G. become aware of the general nature of the work to be performed by Owner and others at the Site that relates to the Work as indicated in the Bidding Documents;
- H. promptly give Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder discovers in the Bidding Documents and confirm that the written resolution thereof by Engineer is acceptable to Bidder;
- I. determine that the Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for the performance and furnishing of the Work; and

- J. agree that the submission of a Bid will constitute an incontrovertible representation by Bidder that Bidder has complied with every requirement of this Article, that without exception the Bid and all prices in the Bid are premised upon performing and furnishing the Work required by the Bidding Documents.

ARTICLE 6 – PRE-BID CONFERENCE

- 6.01 A mandatory pre-Bid conference will be held at the time and location stated in the invitation or advertisement to bid. Representatives of Owner and Engineer will be present to discuss the Project. Bidders are encouraged to attend and participate in the conference. Engineer will transmit to all prospective Bidders of record such Addenda as Engineer considers necessary in response to questions arising at the conference. Oral statements may not be relied upon and will not be binding or legally effective.

ARTICLE 7 – INTERPRETATIONS AND ADDENDA

- 7.01 All questions about the meaning or intent of the Bidding Documents are to be submitted to Engineer in writing. Interpretations or clarifications considered necessary by Engineer in response to such questions will be issued by Addenda delivered to all parties recorded as having received the Bidding Documents and attended the mandatory pre-Bid meeting. Questions received less than seven (7) days prior to the date for opening of Bids may not be answered. Only questions answered by Addenda will be binding. Oral and other interpretations or clarifications will be without legal effect.
- 7.02 7.04 All communications regarding the interpretations of any other matters related to this project shall be addressed to the Engineer's Project Manager:

Martin C. Rodgers, P.E.
Rummel, Klepper & Kahl, LLP
2100 East Cary Street, Suite 309
Richmond, Virginia 23223
FAX: (804) 782-2142
Email: mrodgers@rkk.com

And copied to:

F. Durward Tyson, Jr., P.E.
Greenville Utilities Commission
801 Mumford Road
Greenville, North Carolina 27835
FAX: (252) 551-2048
Email: tysonfd@guc.com

- 7.03 Addenda may be issued to clarify, correct, supplement, or change the Bidding Documents.

ARTICLE 8 – BID SECURITY

- 8.01 A Bid must be accompanied by Bid security made payable to Owner in an amount of **five percent (5%)** of Bidder's maximum Bid price (determined by adding the base bid and all alternates) and in the form of a certified check, bank money order, or a Bid bond (on the form

- included in the Bidding Documents) issued by a surety meeting the requirements of Paragraphs 6.01 and 6.02 of the General Conditions.
- 8.02 The Bid security of the apparent Successful Bidder will be retained until Owner awards the contract to such Bidder, and such Bidder has executed the Contract Documents, furnished the required contract security, and met the other conditions of the Notice of Award, whereupon the Bid security will be released. If the Successful Bidder fails to execute and deliver the Contract Documents and furnish the required contract security within 15 days after the Notice of Award, Owner may consider Bidder to be in default, annul the Notice of Award, and the Bid security of that Bidder will be forfeited. Such forfeiture shall 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 seven 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 seven days after the Bid opening.

ARTICLE 9 – CONTRACT TIMES

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

ARTICLE 10 – LIQUIDATED DAMAGES

- 10.01 Provisions for liquidated damages, if any, 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 11 – SUBSTITUTE AND “OR-EQUAL” ITEMS

- 11.01 The Contract for the Work, as awarded, will be on the basis of materials and equipment specified or described in the Bidding Documents as being supplied by the Contractor 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.
- 11.02 All prices that Bidder sets forth in its Bid shall be based on the presumption that the Owner will furnish the major materials as set forth in the Bidding Documents and the Contractor will furnish the remaining materials and equipment specified or described in the Bidding Documents, as supplemented by Addenda. Any assumptions regarding the possibility of post-Bid approvals of “or-equal” or substitution requests are made at Bidder's sole risk.

ARTICLE 12 – SUBCONTRACTORS, SUPPLIERS, AND OTHERS

- 12.01 A Bidder shall be prepared to retain specific Subcontractors, Suppliers, or other individuals or entities for the performance of the Work if required by the Bidding Documents (most commonly

in the Specifications) to do so. If a prospective Bidder objects to retaining any such Subcontractor, Supplier, or other individual or entity, and the concern is not relieved by an Addendum, then the prospective Bidder should refrain from submitting a Bid.

- 12.02 Subsequent to the submittal of the Bid, Owner may not require the Successful Bidder or Contractor to retain any Subcontractor, Supplier, or other individual or entity against which Contractor has reasonable objection.
- 12.03 The apparent Successful Bidder, and any other Bidder so requested, shall within five days after Bid opening, submit to Owner a list of the Subcontractors or Suppliers proposed portions of the Work.

If requested by Owner, such list shall be accompanied by an experience statement with pertinent information regarding similar projects and other evidence of qualification for each such Subcontractor, Supplier, or other individual or entity. If Owner or Engineer, after due investigation, has reasonable objection to any proposed Subcontractor, Supplier, individual, or entity, Owner may, before the Notice of Award is given, request apparent Successful Bidder to submit an acceptable substitute, in which case apparent Successful Bidder shall 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.

- 12.04 If apparent Successful Bidder declines to make any such substitution, Owner may award the Contract to the next lowest Bidder that proposes to use acceptable Subcontractors, Suppliers, or other individuals or entities. Declining to make requested substitutions will constitute grounds for forfeiture of the Bid security of any Bidder. Any Subcontractor, Supplier, individual, or entity so listed and against which Owner or Engineer makes no written objection prior to the giving of the Notice of Award will be deemed acceptable to Owner and Engineer subject to subsequent revocation of such acceptance as provided in Paragraph 7.06 of the General Conditions.

ARTICLE 13 – PREPARATION OF BID

- 13.01 The Bid Form is included with the Bidding Documents.
- A. All blanks on the Bid Form shall be completed in ink and the Bid Form signed in ink. Erasures or alterations shall be initialed in ink by the person signing the Bid Form. A Bid price shall 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."
- 13.02 A Bid by a corporation shall be executed in the corporate name by a corporate officer (whose title must appear under the signature), accompanied by evidence of authority to sign. The corporate address and state of incorporation shall be shown. The corporate seal shall be affixed and attested by the corporate secretary or an assistant corporate secretary.
- 13.03 A Bid by a partnership shall be executed in the partnership name and signed by a partner (whose title must appear under the signature), accompanied by evidence of authority to sign. The official address of the partnership shall be shown.

- 13.04 A Bid by a limited liability company shall be executed in the name of the firm by a member or other authorized person and accompanied by evidence of authority to sign. The state of formation of the firm and the official address of the firm shall be shown.
- 13.05 A Bid by an individual shall show the Bidder's name and official address.
- 13.06 A Bid by a joint venture shall be executed by an authorized representative of each joint venturer in the manner indicated on the Bid Form. The official address of the joint venture shall be shown.
- 13.07 All names shall be printed in ink below the signatures.
- 13.08 The Bid shall contain an acknowledgment of receipt of all Addenda, the numbers of which shall be filled in on the Bid Form.
- 13.09 Postal and e-mail addresses and telephone number for communications regarding the Bid shall be shown.
- 13.10 The Bid shall contain evidence of Bidder's authority and qualification to do business in the state where the Project is located, or Bidder shall covenant in writing to obtain such authority and qualification prior to award of the Contract and attach such covenant to the Bid. Bidder's state contractor license number, shall also be shown on the Bid Form.

ARTICLE 14 – BASIS OF BID

14.01 *Unit Price*

- A. Bidders shall submit a Bid on a unit price basis for each item of Work listed in the unit price section of the Bid Form.
- B. The "Bid Price" (sometimes referred to as the extended price) for each unit price Bid item will be the product of the "Estimated Quantity" (which Owner or its representative has set forth in the Bid Form) for the item and the corresponding "Bid Unit Price" offered by the Bidder. The total of all unit price Bid items will be the sum of these "Bid Prices"; such total will be used by Owner for Bid comparison purposes. The final quantities and Contract Price will be determined in accordance with Paragraph 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.

14.02 *Allowances*

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

ARTICLE 15 – SUBMITTAL OF BID

- 15.01 With each copy of the Bidding Documents, a Bidder is furnished one separate unbound copy of the Bid Form, and, if required, the Bid Bond Form. The unbound copy of the Bid Form is to be completed and submitted with the Bid security and the other documents required to be submitted under the terms of Article 7 of the Bid Form.

- 15.02 A Bid shall be received no later than the date and time prescribed and at the place indicated in the advertisement or invitation to bid and shall be enclosed in a plainly marked package with the Project title, the name and address of Bidder, and shall be accompanied by the Bid security and other required documents. If a Bid is sent by mail or other delivery system, the sealed envelope containing the Bid shall be enclosed in a separate package plainly marked on the outside with the notation "BID ENCLOSED." A mailed Bid shall be addressed to:

**F. Durward Tyson, Jr., P.E.
Greenville Utilities Commission
801 Mumford Road
Greenville, North Carolina 27835**

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

ARTICLE 16 – MODIFICATION AND WITHDRAWAL OF BID

- 16.01 A 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.
- 16.02 If a Bidder wishes to modify its Bid prior to Bid opening, Bidder must withdraw its initial Bid in the manner specified in Paragraph 16.01 and submit a new Bid prior to the date and time for the opening of Bids.
- 16.03 If within 24 hours after Bids are opened any Bidder files a duly signed written notice with Owner and promptly thereafter demonstrates to the reasonable satisfaction of Owner that there was a material and substantial mistake in the preparation of its Bid, that Bidder may withdraw its Bid, and the Bid security will be returned. Thereafter, if the Work is rebid, that Bidder will be disqualified from further bidding on the Work.

ARTICLE 17 – OPENING OF BIDS

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

ARTICLE 18 – BIDS TO REMAIN SUBJECT TO ACCEPTANCE

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

ARTICLE 19 – EVALUATION OF BIDS AND AWARD OF CONTRACT

- 19.01 Owner reserves the right to reject any or all Bids, including without limitation, nonconforming, nonresponsive, unbalanced, or conditional Bids. Owner will reject the Bid of any Bidder that Owner finds, after reasonable inquiry and evaluation, to not be responsible. 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, then the Owner will reject the Bid as nonresponsive; provided that Owner also reserves the right to waive all minor informalities not involving price, time, or changes in the Work.
- 19.02 If Owner awards the contract for the Work, such award shall be to the responsible Bidder submitting the lowest responsive Bid.
- 19.03 Evaluation of Bids
- A. In evaluating Bids, Owner will consider whether or not the Bids comply with the prescribed requirements, and such alternates, unit prices, and other data, as may be requested in the Bid Form or prior to the Notice of Award.
- 19.04 In evaluating whether a Bidder is responsible, Owner will consider the qualifications of the Bidder and may consider the qualifications and experience of Subcontractors and Suppliers proposed for those portions of the Work for which the identity of Subcontractors and Suppliers must be submitted as provided in the Bidding Documents.
- 19.05 Owner may conduct such investigations as Owner deems necessary to establish the responsibility, qualifications, and financial ability of Bidders and any proposed Subcontractors or Suppliers.

ARTICLE 20 – BONDS AND INSURANCE

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

ARTICLE 21 – SIGNING OF AGREEMENT

- 21.01 When Owner issues a Notice of Award to the Successful Bidder, it shall be accompanied by the unexecuted counterparts of the Agreement along with the other Contract Documents as identified in the Agreement. Within **fifteen (15)** days thereafter, Successful Bidder shall execute and deliver the required number of counterparts of the Agreement (and any bonds and insurance documentation required to be delivered by the Contract Documents) to Owner. Within **sixteen (16)** days thereafter, Owner shall deliver one fully executed counterpart of the Agreement to Successful Bidder, together with printed and electronic copies of the Contract Documents as stated in Paragraph 2.02 of the General Conditions.

ARTICLE 22 – SALES AND USE TAXES

- 22.01 The Contractor shall prepare and provide to the Owner a sales tax report with all of the Contractor's invoices.

ARTICLE 23 – CONTRACTS TO BE ASSIGNED

- 23.01 No separate contracts for equipment or material procurement will be executed by the Owner. All materials and equipment not specifically mentioned as furnished by Owner shall be furnished by the Contractor awarded the Work.

ARTICLE 24 – RETAINAGE

- 24.01 Provisions concerning Contractor's rights to deposit securities in lieu of retainage are set forth in the Agreement.

ARTICLE 25 – PARTNERING

- 25.01 Owner does not intend to participate in a partnering process with Contractor(s).

ARTICLE 26 – EQUAL OPPORTUNITY EMPLOYMENT

- 26.01 The Contractor's employment practices shall be in accordance with North Carolina G.S. 168, and the North Carolina Civil Rights Act of 1964.
- 26.02 Greenville Utilities Commission's (Owner's) policy requires its contractors to document that sufficient good faith efforts have been made to provide equal opportunity for Minority and Women's Business Enterprises (M/WBE) to participate in the subcontracting and material supplier opportunities available under this contract.
- 26.03 The Contractor shall review the requirements and guidelines, and complete the Affidavits set forth in the Special Instructions to Bidders included in SECTION D. The Special Instructions to Bidders must be completed and submitted with the Contractor's Proposal.

Section D

Special Instructions to Bidders

Special Instructions to Bidders

City of Greenville/Greenville Utilities Commission Minority and/or Women Business Enterprise (M/WBE) Program

GUC Construction Guidelines and Affidavits \$100,000 and above

These instructions shall be included with each bid solicitation.

City of Greenville/Greenville Utilities Commission Minority and/or Women Business Enterprise Program

\$100,000 and Above Construction Guidelines for M/WBE Participants

Policy Statement

It is the policy of the City of Greenville and Greenville Utilities Commission to provide minorities and women equal opportunity for participating in all aspects of the City's and Utilities' contracting and procurement programs, including but not limited to, construction projects, supplies and materials purchases, and professional and personal service contracts.

Goals and Good Faith Efforts

Bidders responding to this solicitation shall comply with the M/WBE program by making Good Faith Efforts to achieve the following aspiration goals for participation.

	GUC	
	MBE	WBE
Construction	7%	4%

Bidders shall submit M/WBE information with their bids on the forms provided. This information will be subject to verification by GUC prior to contract award. **As of July 1, 2009, contractors, subcontractors, suppliers, service providers, or M/WBE members of joint ventures intended to satisfy GUC M/WBE goals shall be certified by the NC Office of Historically Underutilized Businesses (NC HUB) only.** Firms qualifying as "WBE" for GUC's goals must be designated as a "women-owned business" by the HUB Office. Firms qualifying as "MBE" for the GUC's goals must be certified in one of the other categories (i.e.: Black, Hispanic, Asian American, American Indian, Disabled, or Socially and Economically Disadvantaged). Those firms who are certified as both a "WBE" and "MBE" may only satisfy the "MBE" requirement. A complete database of NC HUB certified firms may be found at <http://www.doa.nc.gov/hub/>. An internal database of firms who have expressed interest to do business with the City and GUC is available at www.greenvillencmwbe.org. However, the HUB status of these firms must be verified by the HUB database. GUC shall accept NCDOT certified firms on federally funded projects only. **Please note: A contractor may utilize any firm desired. However, for participation purposes, all M/WBE vendors who wish to do business as a minority or a female must be certified by NC HUB.**

The Bidder shall make good faith efforts to encourage participation of M/WBEs prior to submission of bids in order to be considered as a responsive bidder. Bidders are cautioned that even though their submittal indicates they will meet the M/WBE goal, they should document their good faith efforts and be prepared to submit this information, if requested.

The M/WBE's listed by the Contractor on the **Identification of Minority/Women Business Participation** which are determined by the GUC to be certified shall perform the work and supply the materials for which they are listed unless the Contractors receive prior authorization from the GUC to perform the work with other forces or to obtain materials from other sources. If a contractor is proposing to perform all elements of the work with his own forces, he must be prepared to document evidence satisfactory to the owner of similar government contracts where he has self-performed.

The Contractor shall enter into and supply copies of fully executed subcontracts with each M/WBE or supply signed Letter(s) of Intent to the Project Manager after award of contract and prior to Notice to Proceed. Any amendments to subcontracts shall be submitted to the Project Manager prior to execution.

Instructions

The Bidder shall provide with the bid the following documentation:

☐ Identification of Minority/Women Business Participation
(if participation is zero, please mark zero—Blank forms will be considered nonresponsive)

☐ Affidavit A (if subcontracting)

OR

☐ Identification of Minority/Women Business Participation
(if participation is zero, please mark zero—Blank forms will be considered nonresponsive)

☐ Affidavit B (if self-performing; must attest that bidder does not customarily subcontract work on this type of project—includes supplies and materials)

Within 72 hours or 3 business days after notification of being the apparent low bidder who is subcontracting anything must provide the following information:

☐ Affidavit C (if aspirational goals are met or are exceeded)

OR

☐ Affidavit D (if aspirational goals are not met)

After award of contract and prior to issuance of notice to proceed:

☐ Letter(s) of Intent or Executed Contracts

****With each pay request, the prime contractors will submit the Proof of Payment Certification, listing payments made to M/WBE subcontractors.**

*****If a change is needed in M/WBE Participation, submit a Request to Change M/WBE Participation Form. Good Faith Efforts to substitute with another M/WBE contractor must be demonstrated.**

Minimum Compliance Requirements:

All written statements, affidavits, or intentions made by the Bidder shall become a part of the agreement between the Contractor and the GUC for performance of contracts. Failure to comply with any of these statements, affidavits or intentions or with the minority business guidelines shall constitute a breach of the contract. A finding by the GUC that any information submitted (either prior to award of the contract or during the performance of the contract) is inaccurate, false, or incomplete, shall also constitute a breach of the contract. Any such breach may result in termination of the contract in accordance with the termination provisions contained in the contract. It shall be solely at the option of the GUC whether to terminate the contract for breach or not. In determining whether a contractor has made Good Faith Efforts, the GUC will evaluate all efforts made by the Contractor and will determine compliance in regard to quantity, intensity, and results of these efforts.

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

*M/WBE categories: Black, African American (**B**), Hispanic, Latino (**L**), Asian American (**A**) American Indian (**I**), Female (**F**) Socially and Economically Disadvantaged (**S**) Disabled (**D**)

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

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

Greenville Utilities Commission **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.

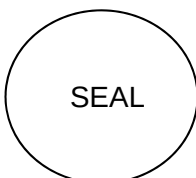
The undersigned, if apparent low bidder, will enter into a formal agreement with the firms listed in the Identification of Minority/Women Business Participation schedule conditional upon scope of contract to be executed with the Owner. Substitution of contractors must be in accordance with GS143-128.2(d) 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/women business commitment and is authorized to bind the bidder to the commitment herein set forth.

Date: _____ Name of Authorized Officer: _____

Signature: _____

Title: _____



State of _____, County of _____

Subscribed and sworn to before me this _____ day of _____ 20____

Notary Public _____

My commission expires _____

**Greenville Utilities Commission --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

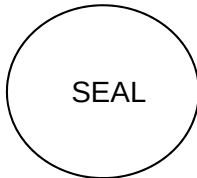
The Bidder agrees to provide any additional information or documentation requested by the owner in support of the above statement.

The 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: _____



State of _____, County of _____

Subscribed and sworn to before me this _____ day of _____ 20____

Notary Public _____

My commission expires _____

Greenville Utilities Commission - AFFIDAVIT C - Portion of the Work to be Performed by M/WBE Firms

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 M/WBE businesses as defined in GS143-128.2(g) and the COG/GUC M/WBE Plan sec. III is equal to or greater than 11% 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 and a minimum of _____% of the total dollar amount of the contract with women business enterprises. Minority/women 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	*M/WBE Category	Work description	Dollar Value

*Minority categories: Black, African American (**B**), Hispanic or Latino (**L**), Asian American (**A**) American Indian (**I**), Female (**F**) Socially and Economically Disadvantaged (**S**) Disabled (**D**)

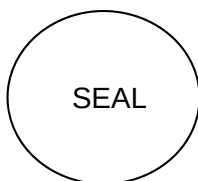
Pursuant to GS143-128.2(d), the undersigned will enter into a formal agreement with M/WBE Firms for work listed in this schedule conditional upon execution of a contract with the Owner. Failure to fulfill this commitment may constitute a breach of the contract.

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: _____



State of _____, County of _____

Subscribed and sworn to before me this _____ day of _____ 20____

Notary Public _____

My commission expires _____

Greenville Utilities Commission 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 11% participation by minority/women 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 ID# _____ (Project Name) _____
Amount of Bid \$ _____

I will expend a minimum of _____% of the total dollar amount of the contract with minority business enterprises and a minimum of _____% of the total dollar amount of the contract with women business enterprises. Minority/women 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	*M/WBE Category	Work description	Dollar Value

*Minority categories: Black, African American (**B**), Hispanic or Latino (**L**), Asian American (**A**) American Indian (**I**), Female (**F**) Socially and Economically Disadvantaged (**S**) Disabled (**D**)

Examples of documentation 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.

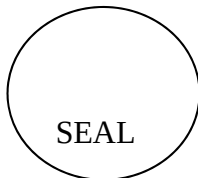
Pursuant to GS143-128.2(d), the undersigned will enter into a formal agreement with M/WBE Firms for work listed in this schedule conditional upon execution of a contract with the Owner. Failure to fulfill this commitment may constitute a breach of the contract.

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: _____



State of _____, County of _____

Subscribed and sworn to before me this _____ day of _____ 20____

Notary Public _____

My commission expires _____

LETTER OF INTENT M/WBE Subcontractor Performance

Please submit this form or executed subcontracts with M/WBE firms after award of contract and prior to issuance of notice to proceed.

PROJECT: _____
(Project Name)

TO: _____
(Name of Prime Bidder/Architect)

The undersigned intends to perform work in connection with the above project as a:

____ Minority Business Enterprise ____ Women Business Enterprise

The M/WBE status of the undersigned is certified the NC Office of Historically Underutilized Businesses (required). ____ Yes ____ No

The undersigned is prepared to perform the following described work or provide materials or services in connection with the above project at the following dollar amount:

Work/Materials/Service Provided	Dollar Amount of Contract	Projected Start Date	Projected End Date

(Date)

(Address)

(Name & Phone No. of M/WBE Firm)

(Name & Title of Authorized Representative of M/WBE)

(Signature of Authorized Representative of M/WBE)

REQUEST TO CHANGE M/WBE PARTICIPATION

(Submit changes only if notified as apparent lowest bidder, continuing through project completion)

Project: _____

Bidder or Prime Contractor: _____

Name & Title of Authorized Representative: _____

Address: _____ **Phone #:** _____

_____ **Email Address:** _____

Total Contract Amount (including approved change orders or amendments): \$_____

Name of subcontractor: _____

Good or service provided: _____

Proposed Action:

___ Replace subcontractor

___ Perform work with own forces

For the above actions, you must provide one of the following reasons (Please check applicable reason):

___ The listed MBE/WBE, after having had a reasonable opportunity to do so, fails or refuses to execute a written contract.

___ The listed MBE/WBE is bankrupt or insolvent.

___ The listed MBE/WBE fails or refuses to perform his/her subcontract or furnish the listed materials.

___ The work performed by the listed subcontractor is unsatisfactory according to industry standards and is not in accordance with the plans and specifications; or the subcontractor is substantially delaying or disrupting the progress of the work.

If replacing subcontractor:

Name of replacement subcontractor: _____

The M/WBE status of the contractor is certified by the NC Office of Historically Underutilized Businesses (required). ☐ Yes ☐ No

Dollar amount of original contract \$ _____

Dollar amount of amended contract \$ _____

Other Proposed Action:

☐ Increase total dollar amount of work

☐ Add additional subcontractor

☐ Decrease total dollar amount of work

☐ Other

Please describe reason for requested action: _____

If adding additional subcontractor:*

The M/WBE status of the contractor is certified by the NC Office of Historically Underutilized Businesses (required). ☐ Yes ☐ No

**Please attach Letter of Intent or executed contract document*

Dollar amount of original contract \$ _____

Dollar amount of amended contract \$ _____

Interoffice Use Only:

Approval ☐ Y ☐ N

Date _____

Signature _____

Pay Application No. _____

Purchase Order No. _____

Proof of Payment Certification

M/WBE Contractors, Suppliers, Service Providers

Project Name: _____

Prime Contractor: _____

Current Contract Amount (including change orders): \$_____

Requested Payment Amount for this Period: \$_____

Is this the final payment? ___Yes ___No

Firm Name	M/WBE Category*	Total Amount Paid from this Pay Request	Total Contract Amount (including changes)	Total Amount Remaining

*Minority categories: Black, African American (**B**), Hispanic or Latino (**L**), Asian American (**A**) American Indian (**I**), Female (**F**) Socially and Economically Disadvantaged (**S**) Disabled (**D**)

Date:_____

Certified By: _____

Name

Title

Signature

Section E

Bid Form

BID FORM

GCP89 – Northwestern Loop High Pressure Gas Main Extension
For the
Greenville Utilities Commission of the City of Greenville, North Carolina

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ARTICLE 1 – BID RECIPIENT

1.01 This Bid is submitted to:

***F. Durward Tyson, Jr., P.E.
Greenville Utilities Commission
801 Mumford Road
Greenville, North Carolina 27835***

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

ARTICLE 2 – BIDDER'S ACKNOWLEDGEMENTS

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

ARTICLE 3 – BIDDER'S REPRESENTATIONS

3.01 In submitting this Bid, Bidder represents that:

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

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

- B. Bidder has visited the Site, conducted a thorough, alert visual examination of the Site and adjacent areas, and become familiar with and satisfied itself as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work.
- C. Bidder is familiar with and has satisfied itself as to all Laws and Regulations that may affect cost, progress, and performance of the Work.
- D. Bidder has carefully studied all: (1) reports of explorations and tests of subsurface conditions at or adjacent to the Site and all drawings of physical conditions relating to existing surface or subsurface structures at the Site that have been identified in the Supplementary Conditions, especially with respect to Technical Data in such reports and drawings, and (2) reports and drawings relating to Hazardous Environmental Conditions, if any, at or adjacent to the Site that have been identified in the Supplementary Conditions, especially with respect to Technical Data in such reports and drawings.

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

ARTICLE 4 – BIDDER'S CERTIFICATION

4.01 Bidder certifies that:

- A. This Bid is genuine and not made in the interest of or on behalf of any undisclosed individual or entity and is not submitted in conformity with any collusive agreement or rules of any group, association, organization, or corporation;
- B. Bidder has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid;
- C. Bidder has not solicited or induced any individual or entity to refrain from bidding; and
- D. Bidder has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for the Contract. For the purposes of this Paragraph 4.01.D:
 - 1. "corrupt practice" means the offering, giving, receiving, or soliciting of any thing of value likely to influence the action of a public official in the bidding process;
 - 2. "fraudulent practice" means an intentional misrepresentation of facts made (a) to influence the bidding process to the detriment of Owner, (b) to establish bid prices at artificial non-competitive levels, or (c) to deprive Owner of the benefits of free and open competition;
 - 3. "collusive practice" means a scheme or arrangement between two or more Bidders, with or without the knowledge of Owner, a purpose of which is to establish bid prices at artificial, non-competitive levels; and

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

ARTICLE 5 – BASIS OF BID

- 5.01 Bidder will complete the Work in accordance with the Contract Documents for the following price(s):

UNIT PRICE BID

	PIPELINE ITEMS				
Item No.	Description	Unit	Estimated Quantity	Bid Unit Price	Bid Price
1001	Mobilization	EA	1		
1002	Demobilization	EA	1		
2001	Clearing & grubbing new ROW	ACRE	0.5		
2002	Clearing & grubbing existing ROW	ACRE	6		
2003	Install, maintain & remove silt fences	LF	3,132		
2004	Construct diversion ditches (water bars)	LF	250		
2005	Construction matting – provide, install, move, remove	SY	3,300		
3001	Traffic control – provide, install, maintain, remove	DAYS	45		
3002	Remove & replace NCDOT guard rail	LF	30		
3003	Remove & replace NCDOT controlled access fencing	LF	520		
4001	Sight (test) holes in soil	EA	19		
4002	Sight (test) holes in asphalt pavement	EA	2		
5001	Furnish & install new asphalt drive apron to electric substation off NCSR 1202	SF	800		
5002	Furnish, install & remove four (4) stone construction entrances	TN	934		
5003	Furnish & install 4” #57 stone driveway to Hwy 43 District Regulator Station	TN	115		

Item No.	Description	Unit	Estimated Quantity	Bid Unit Price	Bid Price
6001	Install API 5L GRB, 6", 0.280"w.t., Fusion Bonded Epoxy coated pipe by conventional trenching at 3' to 5' depth.	LF	7,498		
6002	Install API 5L GRB, 6", 0.280"w.t., Fusion Bonded Epoxy coated pipe by conventional trenching at over 5' to 8' depth.	LF	356		
6003	Install API 5L GRB, 6", 0.280"w.t., Fusion Bonded Epoxy coated pipe by conventional trenching at over 8' to 12' depth.	LF	892		
6004	Install API 5L GRB, 6", 0.280"w.t., Fusion Bonded Epoxy coated pipe with Abrasive Resistant Overcoat by horizontal directional drilling	LF	5,791		
6005	Install API 5L GRB, 6", 0.280"w.t., Fusion Bonded Epoxy coated pipe with Abrasive Resistant Overcoat by method of jack and bore	LF	105		
6006	HDD rig/pipe site work	EA	7		
6007	Install and remove air release valve assemblies on 6" steel pipe	EA	14		
6008	Furnish & install sand bedding for pipe	TN	114		
6009	Furnish & install select fill	CY	8,426		
6010	Install 6" ANSI 300 weld end ball valve assemblies complete	EA	3		
6011	Install 6" steel pipe tie-in at Gate Station No.3	EA	1		
6012	Install 6" polyethylene pipe downstream of the Hwy 43 district regulator station	LF	408		
6013	Tie-in 6" polyethylene gas main to 6" polyethylene gas main along Hwy 43	EA	1		
6014	Install 6" polyethylene gas valve complete at Hwy 43 tie-in	EA	1		

Item No.	Description	Unit	Estimated Quantity	Bid Unit Price	Bid Price
7001	Install and commission rectifier & anode groundbed complete	EA	1		
7002	Install cathodic protection test stations	EA	9		
8001	Install alternating current mitigator	LF	1,900		
8002	Install solid state decouplers (SSD)	EA	8		
8003	Install ground mats (4'x8')	EA	11		
9001	Hydrotest water (from City hydrant)	GAL	27,000		
9002	Furnish, install, maintain and remove hydrostatic test dewatering structure	EA	1		
9003	Hydrostatic testing of 17,004 LF of 6" steel pipeline complete with dewatering	LS	1		
9004	Pigging, drying, purging & gas-up of 17,004 LF of 6" steel pipeline	LS	1		
9005	Air or nitrogen pressure testing of 408 LF of 6" polyethylene gas main	LS	1		
9006	Pigging, purging and gas-up of 408 LF of 6" polyethylene gas main	LS	1		
1101	Restoration of 6" steel pipeline ROW (seed, mulch, tack)	AC	20		
1102	Furnish and Install 2" of #57 stone for restoring private driveway south of NC Hwy 43	TN	88		
1103	Install pipeline markers	EA	36		
Total of Pipeline Unit Price Bid Items					\$

	HIGHWAY 43 METER & REGULATOR STATION ITEMS				
Item No.	Description	Unit	Estimated Quantity	Bid Unit Price	Bid Price
1201	Clearing and grubbing	AC	0.05		
1202	Regular excavation up to 6" below surface in yard area	CY	25		
1203	Furnish and install up to 1' of clean fill to subgrade	CY	50		
1204	Yard Grading	SY	220		
1205	Furnish and install 6" of #57 stone for regulator station yard and entrance	TN	27		
1206	Restoration of regulator station site outside of stone-surfaced area (Seed, mulch and fertilized per plans)	SY	24		
1301	Furnish and install 8' high chain link fence	LF	112		
1302	Furnish and install 3' wide chain link swing man gate	EA	1		
1303	Furnish and install 12' long chain link cantilever slide gate	EA	2		
1401	Fabricate and install regulator station piping, instrumentation, control, and electrification	LS	1		
1402	Pressure test station piping with air or nitrogen	LS	1		
1403	Tie-in regulator station inlet piping to 6" NW Loop High Pressure Steel Gas Main	LS	1		
1404	Clean, purge and gas-up regulator station	LS	1		
1405	Soap leak test station	LS	1		
1406	Tie-in regulator station outlet piping to 6" PE distribution gas main along access road to regulator station.	LS	1		
1407	Clean, prime and paint regulator station	LS	1		
1408	Commission station and deliver working station to Owner	LS	1		
Total of Hwy 43 Meter & Regulator Station Unit Price Bid Items					\$

	OLD RIVER ROAD METER & REGULATOR STATION ITEMS				
Item No.	Description	Unit	Estimated Quantity	Bid Unit Price	Bid Price
1501	Clearing and grubbing	AC	0.10		
1502	Regular excavation up to 6" below surface in yard area	CY	51		
1503	Furnish and install up to 1' of clean fill to subgrade	CY	102		
1504	Yard Grading	SY	491		
1505	Furnish and install 6" of #57 stone for regulator station yard and entrance	TN	29		
1506	Furnish and install 4" #57 stone station driveway	TN	28		
1507	Restoration of regulator station site outside of stone-surfaced area (Seed, mulch and fertilized per plans)	SY	185		
1601	Furnish and install 8' high chain link fence	LF	121		
1602	Furnish and install 3' wide chain link swing man gate	EA	1		
1603	Furnish and install 12' long chain link cantilever slide gate	EA	2		
1701	Fabricate and install regulator station piping, instrumentation, control, and electrification	LS	1		
1702	Pressure test station piping with air or nitrogen	LS	1		
1703	Tie-in regulator station inlet piping to 6" NW Loop High Pressure Steel Gas Main	LS	1		
1704	Clean, purge and gas-up regulator station	LS	1		
1405	Soap leak test station	LS	1		
1705	Tie-in regulator station outlet piping to 6" PE distribution gas main along access road to regulator station.	LS	1		
1706	Clean, prime and paint regulator station	LS	1		
1706	Commission station and deliver working station to Owner	LS	1		
Total of Old River Road Meter & Regulator Station Unit Price Bid Items					\$

Total of Unit Price Bids = Total Bid Price	\$	

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

The purpose of the formula above is only to calculate the lowest price-plus-time bid amount for bid comparison purposes. The price for completion of the Work (the Contract Price) is based on the cost of the Work, plus a fee, subject to a guaranteed maximum price, as set forth in the Agreement.

Bonds required under Paragraph 6.01 of the General Conditions will be based on the Contract Price.

None of the costs described in Paragraph 13.01.C of the General Conditions will be included in determining Contractor's fee.

ARTICLE 6 – TIME OF COMPLETION

- 6.01 Bidder agrees that the Work will be substantially complete and will be completed and ready for final payment in accordance with Paragraph 15.06 of the General Conditions on or before the dates or within the number of calendar days indicated in the Agreement.
- 6.02 Bidder accepts the provisions of the Agreement as to liquidated damages.

ARTICLE 7 – ATTACHMENTS TO THIS BID

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

ARTICLE 8 – DEFINED TERMS

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

ARTICLE 9 – BID SUBMITTAL

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

By:

[Signature]

[Printed name]

(If Bidder is a corporation, a limited liability company, a partnership, or a joint venture, attach evidence of authority to sign.)

Attest:

[Signature]

[Printed name]

Title:

Submittal Date:

Address for giving notices:

Telephone Number:

Fax Number:

Contact Name and e-mail address:

Bidder's License No.:

Section F

Bid Bond

BID BOND

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

BIDDER (*Name and Address*):

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

OWNER (*Name and Address*): **Greenville Utilities Commission**
PO Box 1847
Greenville, North Carolina 27835-1847

BID

Bid Due Date:

Description (*Project Name— Include Location*): GCP89 - Northwestern Loop High Pressure Gas Main
Extension; Pitt County, North Carolina

BOND

Bond Number:

Date:

Penal sum _____ \$ _____
(Words) (Figures)

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

BIDDER

SURETY

Bidder's Name and Corporate Seal

Surety's Name and Corporate Seal

By:

Signature

Print Name

Title

Attest:

Signature

Title

By:

Signature (Attach Power of Attorney)

Print Name

Title

Attest:

Signature

Title

Note: Addresses are to be used for giving any required notice.

Provide execution by any additional parties, such as joint venturers, if necessary.

1. Bidder and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to pay to Owner upon default of Bidder the penal sum set forth on the face of this Bond. Payment of the penal sum is the extent of Bidder's and Surety's liability. Recovery of such penal sum under the terms of this Bond shall be Owner's sole and exclusive remedy upon default of Bidder.
2. Default of Bidder shall occur upon the failure of Bidder to deliver within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner) the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents.
3. This obligation shall be null and void if:
 - 3.1 Owner accepts Bidder's Bid and Bidder delivers within the time required by the Bidding Documents (or any extension thereof 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, 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 by Owner, provided that the total time for issuing Notice of Award including extensions shall not in the aggregate exceed 120 days from the Bid due date without Surety's written consent.
6. No suit or action shall be commenced under this Bond prior to 30 calendar days after the notice of default required in Paragraph 4 above is received by Bidder and Surety and in no case later than one year after the Bid due date.
7. Any suit or action under this Bond shall be commenced only in a court of competent jurisdiction located in the state in which the Project is located.
8. Notices required hereunder shall be in writing and sent to Bidder and Surety at their respective addresses shown on the face of this Bond. Such notices may be sent by personal delivery, commercial courier, or by United States Registered or Certified Mail, return receipt requested, postage pre-paid, and shall be deemed to be effective upon receipt by the party concerned.
9. Surety shall cause to be attached to this Bond a current and effective Power of Attorney evidencing the authority of the officer, agent, or representative who executed this Bond on behalf of Surety to execute, seal, and deliver such Bond and bind the Surety thereby.
10. This Bond is intended to conform to all applicable statutory requirements. Any applicable requirement of any applicable statute that has been omitted from this Bond shall be deemed to be included herein as if set forth at length. If any provision of this Bond conflicts with any applicable statute, then the provision of said statute shall govern and the remainder of this Bond that is not in conflict therewith shall continue in full force and effect.
11. The term "Bid" as used herein includes a Bid, offer, or proposal as applicable.
12. **IMPORTANT – Surety companies executing Bonds must appear on the Treasury Department's most current list (Circular 570 as amended) and be authorized to transact business in the State of North Carolina.**

Section G

Qualifications Statement

QUALIFICATIONS STATEMENT

THE INFORMATION SUPPLIED IN THIS DOCUMENT IS CONFIDENTIAL TO THE EXTENT
PERMITTED BY LAWS AND REGULATIONS

1. SUBMITTED BY:

Official Name of Firm:

Address:

2. SUBMITTED TO:

Greenville Utilities Commission

3. SUBMITTED FOR:

Owner:

Greenville Utilities Commission

Project Name:

GCP89 – Northwestern Loop High Pressure Gas Main Extension

TYPE OF WORK:

4. CONTRACTOR'S CONTACT INFORMATION

Contact Person:

Title:

Phone:

Email:

5. AFFILIATED COMPANIES:

Name:

Address:

6. TYPE OF ORGANIZATION:

☐ SOLE PROPRIETORSHIP

Name of Owner:

Doing Business As:

Date of Organization:

☐ PARTNERSHIP

Date of Organization:

Type of Partnership:

Name of General Partner(s):

☐ CORPORATION

State of Organization:

Date of Organization:

Executive Officers:

- President:

- Vice President(s):

- Treasurer:

- Secretary:

☐ LIMITED LIABILITY COMPANY

State of Organization:

Date of Organization:

Members:

☐ JOINT VENTURE

Sate of Organization:

Date of Organization:

Form of Organization:

Joint Venture Managing Partner

- Name:

- Address:

Joint Venture Managing Partner

- Name:

- Address:

Joint Venture Managing Partner

- Name:

- Address:

7. LICENSING

Jurisdiction: _____

Type of License: _____

License Number: _____

Jurisdiction: _____

Type of License: _____

License Number: _____

8. CERTIFICATIONS

CERTIFIED BY:

Disadvantage Business Enterprise: _____

Minority Business Enterprise: _____

Woman Owned Enterprise: _____

Small Business Enterprise: _____

Other (_____): _____

9. BONDING INFORMATION

Bonding Company: _____

Address: _____

Bonding Agent: _____

Address: _____

Contact Name: _____

Phone: _____

Aggregate Bonding Capacity: _____

Available Bonding Capacity as of date of this submittal: _____

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10. FINANCIAL INFORMATION

Financial Institution: _____

Address: _____

Account Manager: _____

Phone: _____

11. CONSTRUCTION EXPERIENCE:

Current Experience:

List on **Schedule A** all uncompleted projects currently under contract (If Joint Venture list each participant's projects separately).

Previous Experience:

List on **Schedule B** all projects completed within the last 5 Years (If Joint Venture list each participant's projects separately).

Has firm listed in Section 1 ever failed to complete a construction contract awarded to it?

☐ YES ☐ NO

If YES, attach as an Attachment details including Project Owner's contact information.

Has any Corporate Officer, Partner, Joint Venture participant or Proprietor ever failed to complete a construction contract awarded to them in their name or when acting as a principal of another entity?

☐ YES ☐ NO

If YES, attach as an Attachment details including Project Owner's contact information.

Are there any judgments, claims, disputes or litigation pending or outstanding involving the firm listed in Section 1 or any of its officers (or any of its partners if a partnership or any of the individual entities if a joint venture)?

☐ YES ☐ NO

If YES, attach as an Attachment details including Project Owner's contact information.

12. SAFETY PROGRAM:

Name of Contractor's Safety Officer: _____

Include the following as attachments:

Provide as an Attachment Contractor's (and Contractor's proposed Subcontractors and Suppliers furnishing or performing Work having a value in excess of 10 percent of the total amount of the Bid) OSHA No. 500- Log & Summary of Occupational Injuries & Illnesses for the past 5 years.

Provide as an Attachment Contractor's (and Contractor's proposed Subcontractors and Suppliers furnishing or performing Work having a value in excess of 10 percent of the total amount of the Bid) list of all OSHA Citations & Notifications of Penalty (monetary or other) received within the last 5 years (indicate disposition as applicable) - IF NONE SO STATE.

Provide as an Attachment Contractor's (and Contractor's proposed Subcontractors and Suppliers furnishing or performing Work having a value in excess of 10 percent of the total amount of the Bid) list of all safety citations or violations under any state all received within the last 5 years (indicate disposition as applicable) - IF NONE SO STATE.

Provide the following for the firm listed in Section V (and for each proposed Subcontractor furnishing or performing Work having a value in excess of 10 percent of the total amount of the Bid) the following (attach additional sheets as necessary):

Workers' compensation Experience Modification Rate (EMR) for the last 5 years:

YEAR	_____	EMR	_____
YEAR	_____	EMR	_____
YEAR	_____	EMR	_____
YEAR	_____	EMR	_____
YEAR	_____	EMR	_____

Total Recordable Frequency Rate (TRFR) for the last 5 years:

YEAR	_____	TRFR	_____
YEAR	_____	TRFR	_____
YEAR	_____	TRFR	_____
YEAR	_____	TRFR	_____
YEAR	_____	TRFR	_____

Total number of man-hours worked for the last 5 Years:

YEAR	_____	TOTAL NUMBER OF MAN-HOURS	_____

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YEAR	_____	TOTAL NUMBER OF MAN-HOURS	_____
YEAR	_____	TOTAL NUMBER OF MAN-HOURS	_____
YEAR	_____	TOTAL NUMBER OF MAN-HOURS	_____
YEAR	_____	TOTAL NUMBER OF MAN-HOURS	_____

Provide Contractor's (and Contractor's proposed Subcontractors and Suppliers furnishing or performing Work having a value in excess of 10 percent of the total amount of the Bid) Days Away From Work, Days of Restricted Work Activity or Job Transfer (DART) incidence rate for the particular industry or type of Work to be performed by Contractor and each of Contractor's proposed Subcontractors and Suppliers) for the last 5 years:

YEAR	_____	DART	_____
YEAR	_____	DART	_____
YEAR	_____	DART	_____
YEAR	_____	DART	_____
YEAR	_____	DART	_____

13. EQUIPMENT:

MAJOR EQUIPMENT:

List on **Schedule C** all pieces of major equipment available for use on Owner's Project.

I HEREBY CERTIFY THAT THE INFORMATION SUBMITTED HERewith, INCLUDING ANY ATTACHMENTS, IS TRUE TO THE BEST OF MY KNOWLEDGE AND BELIEF.

NAME OF ORGANIZATION: _____

BY: _____

TITLE: _____

DATED: _____

NOTARY ATTEST:

SUBSCRIBED AND SWORN TO BEFORE ME

THIS _____ DAY OF _____, 20____

NOTARY PUBLIC - STATE OF _____

MY COMMISSION EXPIRES: _____

REQUIRED ATTACHMENTS

1. Schedule A (Current Experience).
2. Schedule B (Previous Experience).
3. Schedule C (Major Equipment).
4. Audited balance sheet for each of the last 3 years for firm named in Section 1.
5. Evidence of authority for individuals listed in Section 7 to bind organization to an agreement.
6. Resumes of officers and key individuals (including Safety Officer) of firm named in Section 1.
7. Required safety program submittals listed in Section 13.
8. Additional items as pertinent.

SCHEDULE A

CURRENT EXPERIENCE

Project Name	Owner's Contact Person	Design Engineer	Contract Date	Type of Work	Status	Cost of Work
	Name: Address: Telephone:	Name: Company: Telephone:				
	Name: Address: Telephone:	Name: Company: Telephone:				
	Name: Address: Telephone:	Name: Company: Telephone:				
	Name: Address: Telephone:	Name: Company: Telephone:				
	Name: Address: Telephone:	Name: Company: Telephone:				
	Name: Address: Telephone:	Name: Company: Telephone:				
	Name: Address: Telephone:	Name: Company: Telephone:				

SCHEDULE B

PREVIOUS EXPERIENCE (Include ALL Projects Completed within last 5 years)

Project Name	Owner's Contact Person	Design Engineer	Contract Date	Type of Work	Status	Cost of Work
	Name: Address: Telephone:	Name: Company: Telephone:				
	Name: Address: Telephone:	Name: Company: Telephone:				
	Name: Address: Telephone:	Name: Company: Telephone:				
	Name: Address: Telephone:	Name: Company: Telephone:				
	Name: Address: Telephone:	Name: Company: Telephone:				
	Name: Address: Telephone:	Name: Company: Telephone:				
	Name: Address: Telephone:	Name: Company: Telephone:				

SCHEDULE B

PREVIOUS EXPERIENCE (Include ALL Projects Completed within last 5 years)

Project Name	Owner's Contact Person	Design Engineer	Contract Date	Type of Work	Status	Cost of Work
	Name: Address: Telephone:	Name: Company: Telephone:				
	Name: Address: Telephone:	Name: Company: Telephone:				
	Name: Address: Telephone:	Name: Company: Telephone:				
	Name: Address: Telephone:	Name: Company: Telephone:				
	Name: Address: Telephone:	Name: Company: Telephone:				
	Name: Address: Telephone:	Name: Company: Telephone:				
	Name: Address: Telephone:	Name: Company: Telephone:				

SCHEDULE C - LIST OF MAJOR EQUIPMENT AVAILABLE

[illegible]

Section H

Notice of Award

NOTICE OF AWARD

Date of Issuance:

Owner: Greenville Utilities Commission

Owner's Contract No.:

Engineer: Rummel, Klepper & Kahl, LLP

Engineer's Project No.: 1214-011

Project: GCP89

Contract Name:

Bidder:

Bidder's Address:

TO BIDDER:

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

GCP89 – Northwestern Loop High Pressure Gas Main Extension.

The Contract Price of the awarded Contract is: \$_____ [subject to unit prices]

Two (2) 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.

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

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

1. Deliver to Owner two (2) counterparts of the Agreement, fully executed by Bidder.
2. Deliver with the executed Agreement(s) the Contract security [*e.g., performance and payment bonds*] and insurance documentation as specified in the Instructions to Bidders and General Conditions, Articles 2 and 6.

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

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

Owner: Greenville Utilities Commission

By: _____
Anthony C. Cannon

Title: General Manager / C.E.O.

Copy: Engineer

Section I

Agreement

THIS AGREEMENT is by and between Greenville Utilities Commission (“Owner”) and
 (“Contractor”).

- A. Construct, test, purge, and gas-up of the Northwestern Loop High Pressure Gas Main Extension and two district regulator stations. The proposed 6-inch API 5L GRB, 0.280-inch wall thickness, epoxy thin-film coated steel natural gas main is approximately 3.2 miles in length. The route of the proposed gas main begins at the Greenville Utilities Commission's Gate Station No.3 south of MacGregor Downs Road (NCSR 1202) and follows the electric power line to the north paralleling NC Hwy 264 Bypass across NC Hwy 43 and the Tar River, and terminates at Riverview Road (NCSR 1464) just south of Old River Road (NCSR 1401). Construction will be mostly within existing utility easements, new parallel easements and temporary work space easements. As designed, there are seven (7) horizontal directional drills (HDDs), one conventional bore without casing, and the remainder of the construction is designed to be performed by conventional means. The new gas main is to be hydrostatically tested to 840 psig for a maximum allowable operating pressure (MAOP) of 560 psig. The Greenville Utilities Commission intends to operate the main at 260 psig.
- B. The Contractor will be required to deliver a tested, cleaned, purged, and gassed-up pipeline and tested, cleaned, purged and gassed-up regulator stations. The Contractor shall make all tie-ins between the Northwestern Loop High Pressure Gas Main Extension and the district regulator stations and shall make all tie-ins from the regulator station outlet piping to the polyethylene (PE) natural gas distribution system. The Contractor shall coordinate the tie-in of the Old River Road District Regulator Station with the Greenville Utilities Commission construction crews that will be constructing the 6-inch PE Old River Road Gas Main Extension. The Contractor shall coordinate the tie-in to the existing 4-inch PE natural gas main along the north side of NC Hwy 43 with the Greenville Utilities Commission.

ARTICLE 3 – ENGINEER

- 3.01 The Project has been designed by Rummel, Klepper & Kahl, LLP.
- 3.02 The Owner has retained Rummel Klepper & Kahl, LLP (“Engineer”) to act as Owner’s representative, assume all duties and responsibilities, and have the rights and authority assigned to Engineer in the Contract Documents in connection with the completion of the Work in accordance with the Contract Documents.

ARTICLE 4 – CONTRACT TIMES

- 4.01 *Time of the Essence*
- A. All time limits for Milestones, if any, Substantial Completion, and completion and readiness for final payment as stated in the Contract Documents are of the essence of the Contract.
- 4.02 *Contract Times: Days*
- A. The Work will be completed and ready for final payment in accordance with Paragraph 15.06 of the General Conditions within 120 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 times specified in Paragraph 4.02 above, plus any extensions thereof allowed in accordance with the Contract. The parties also recognize the delays, expense, and difficulties involved in proving in a legal or arbitration proceeding the actual loss suffered by Owner if the Work is not completed on time. Accordingly, instead of requiring any such proof, Owner and Contractor agree that as liquidated damages for delay (but not as a penalty):
1. Contractor shall pay Owner \$1,000 for each day that expires after the time (as duly adjusted pursuant to the Contract) specified in Paragraph 4.02.A above for completion and readiness for final payment for each day that expires after such time until the Work is completed and ready for final payment.
 2. Liquidated damages for failing to timely attain Substantial Completion and final completion are not additive and will not be imposed concurrently.

ARTICLE 5 – CONTRACT PRICE

- 5.01 Owner shall pay Contractor for completion of the Work in accordance with the Contract Documents the amounts that follow, subject to adjustment under the Contract:
- A. For all Unit Price Work, an amount equal to the sum of the extended prices (established for each separately identified item of Unit Price Work by multiplying the unit price times the actual quantity of that item):

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

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 account of the Contract Price on the basis of Contractor's Applications for Payment on or about the 25th day of each month during performance of the Work as provided in Paragraph 6.02.A.1 below, provided that such Applications for Payment have been submitted in a timely manner and otherwise meet the requirements of the Contract. All such payments will be measured by the Schedule of Values established as provided in the General Conditions (and in the case of Unit Price Work based on the number of units completed) or, in the event there is no Schedule of Values, as provided elsewhere in the Contract.
 - 1. Prior to Substantial Completion, progress payments will be made in an amount equal to the percentage indicated below but, in each case, less the aggregate of payments previously made and less such amounts as Owner may withhold, including but not limited to liquidated damages, in accordance with the Contract
 - a. 95 percent of Work completed (with the balance being retainage). If the Work has been 50 percent completed as determined by Engineer, and if the character and progress of the Work have been satisfactory to Owner and Engineer, then as long as the character and progress of the Work remain satisfactory to Owner and Engineer, there will be no additional retainage; and
 - b. 95 percent of cost of materials and equipment not incorporated in the Work (with the balance being retainage).
- B. Upon Substantial Completion, Owner shall pay an amount sufficient to increase total payments to Contractor to 100 percent of the Work completed, less such amounts 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 in accordance with Paragraph 15.06 of the General Conditions, Owner shall pay the remainder of the Contract Price as recommended by Engineer as provided in said Paragraph 15.06.

ARTICLE 7 – INTEREST

- 7.01 All amounts not paid when due shall bear interest at the maximum legal rate of percent.

ARTICLE 8 – CONTRACTOR'S REPRESENTATIONS

- 8.01 In order to induce Owner to enter into this Contract, Contractor makes the following representations:
 - A. Contractor has examined and carefully studied the Contract Documents, and any data and reference items identified in the Contract Documents.

- B. Contractor has visited the Site, conducted a thorough, alert visual examination of the Site and adjacent areas, and become familiar with and is satisfied as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work.
- C. Contractor is familiar with and is satisfied as to all Laws and Regulations that may affect cost, progress, and performance of the Work.
- D. Contractor has carefully studied all: (1) reports of explorations and tests of subsurface conditions at or adjacent to the Site and all drawings of physical conditions relating to existing surface or subsurface structures at the Site that have been identified in the Supplementary Conditions, especially with respect to Technical Data in such reports and drawings, and (2) reports and drawings relating to Hazardous Environmental Conditions, if any, at or adjacent to the Site that have been identified in the Supplementary Conditions, especially with respect to Technical Data in such reports and drawings.
- E. 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 Site-related reports and drawings identified in the Contract Documents, with respect to the effect of such information, observations, and documents on (1) the cost, progress, and performance of the Work; (2) the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor; and (3) Contractor's safety precautions and programs.
- F. 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.
- G. Contractor is aware of the general nature of work to be performed by Owner and others at the Site that relates to the Work as indicated in the Contract Documents.
- H. Contractor has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Contractor has discovered in the Contract Documents, and the written resolution thereof by Engineer is acceptable to Contractor.
- I. The Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.
- J. 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.

ARTICLE 9 – CONTRACT DOCUMENTS

9.01 *Contents*

- A. The Contract Documents consist of the following:
 - 1. This Agreement (pages 1 to 7, inclusive).
 - 2. Performance bond (pages 1 to 3, inclusive).
 - 3. Payment bond (pages 1 to 3, inclusive).
 - 4. Other bonds.
 - a. None

5. General Conditions (pages 1 to 65, inclusive).
 6. Supplementary Conditions (pages 1 to 12, inclusive).
 7. Specifications as listed in the table of contents of the Bidding Documents.
 8. Drawings (not attached but incorporated by reference) consisting of the Drawings listed on the attached DOCUMENT 000115 – LIST OF DRAWING SHEETS. The Drawings are also referred to as the Project Plans in sections of the Project Specifications.
 9. Addenda (numbers to , inclusive).
 10. Exhibits to this Agreement (enumerated as follows):
 - a. Contractor's Bid (pages 1 to 7, inclusive).
 11. The following which may be delivered or issued on or after the Effective Date of the Contract and are not attached hereto:
 - a. Notice to Proceed.
 - b. Work Change Directives.
 - c. Change Orders.
 - d. Field Orders.
- B. The documents listed in Paragraph 9.01.A are attached to this Agreement (except as expressly noted otherwise above).
- C. There are no Contract Documents other than those listed above in this Article 9.
- D. The Contract Documents may only be amended, modified, or supplemented as provided in the General Conditions.

ARTICLE 10 – MISCELLANEOUS

10.01 *Terms*

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

10.02 *Assignment of Contract*

- A. Unless expressly agreed to elsewhere in the Contract, no assignment by a party hereto of any rights under or interests in the Contract will be binding on another party hereto without the written consent of the party sought to be bound; and, specifically but without limitation, 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 Documents.

10.03 *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.

10.04 *Severability*

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

10.05 *Contractor's Certifications*

- A. Contractor certifies that it has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for or in executing the Contract. For the purposes of this Paragraph 10.05:
 - 1. "corrupt practice" means the offering, giving, receiving, or soliciting of any thing 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.

10.06 *Other Provisions*

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

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

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

OWNER:

Greenville Utilities Commission of the City of
Greenville, North Carolina

CONTRACTOR:

By: Anthony C. Cannon

Title: General Manager / CEO

Attest: _____

Amy Carson Quinn

Title: Executive Secretary

Address for giving notices:

Greenville Utilities Commission

PO Box 1847

Greenville, North Carolina 27835-1847

By: _____

Title: _____

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

Attest: _____

Title: _____

Address for giving notices:

License No.: _____

(where applicable)

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

NOTE TO USER: Use in those states or other jurisdictions where applicable or required.

DOCUMENT 000115 - LIST OF CONTRACT DRAWING SHEETS

1.1 LIST OF DRAWINGS

- A. Drawings: Drawings consist of the Contract Plans and Details listed in the Table of Contents on the cover page of the separately bound drawing sets titled:
1. **GCP89 - Western Loop High Pressure Gas Main**, dated June 1, 2015, as modified by subsequent Addenda and Contract modifications.
 2. **GCP89 - Highway 43 District Regulator Station**, dated June 1, 2015, as modified by subsequent Addenda and Contract modifications.
 3. **GCP89 - Old River Road District Regulator Station**, dated June 1, 2015, as modified by subsequent Addenda and Contract modifications.
- B. List of Contract Plan Sheets according to drawing set:
1. **GCP89 - Northwestern Loop High Pressure Gas Main Extension, dated June 1, 2015.**

Sheet Number	Sheet Description	Date
-	COVER SHEET	
G-1	GENERAL NOTES AND DRAWING LEGEND	
G-2	SPECIAL EASEMENT REQUIREMENTS	
A-1	PLAN AND PROFILE SHEET - STA 10+00 TO STA 24+75	
A-1A	PLAN SHEET - STA 10+00 TO STA 24+75	
A-1B	GATE 3 REGULATOR STATION SITE PLAN	
A-2	PLAN AND PROFILE SHEET - STA 24+75 TO STA 39+00	
A-2A	PLAN SHEET - STA 24+75 TO STA 39+00	
A-3	PLAN AND PROFILE SHEET - STA 39+00 TO STA 53+50	
A-4	PLAN AND PROFILE SHEET - STA 53+50 TO STA 62+25	
A-5	PLAN AND PROFILE SHEET - STA 62+25 TO STA 75+50	
A-6	PLAN AND PROFILE SHEET - STA 75+50 TO STA 89+50	
A-6A	PLAN AND PROFILE SHEET - STA 10+00 TO STA 13+65	
A-7	PLAN AND PROFILE SHEET - STA 89+50 TO STA 103+00	
A-8	PLAN AND PROFILE SHEET - STA 103+00 TO STA 116+75	
A-9	PLAN AND PROFILE SHEET - STA 116+75 TO STA 130+50	

Sheet Number	Sheet Description	Date
A-10	PLAN AND PROFILE SHEET - STA 130+50 TO STA 144+10	
A-11	PLAN AND PROFILE SHEET - STA 144+10 TO STA 158+50	
A-12	PLAN AND PROFILE SHEET - STA 158+50 TO STA 172+50	
A-13	PLAN AND PROFILE SHEET - STA 172+50 TO STA 176+32	
D-1	BILL OF MATERIALS	
D-2	PIPELINE DETAILS	
D-3	PIPELINE DETAILS	
ES-1	PIPELINE DETAILS	
ES-2	EROSION AND SEDIMENT CONTROL NOTES	
ES-3	EROSION AND SEDIMENT CONTROL NOTES	
ES-4	EROSION AND SEDIMENT CONTROL NOTES	
ES-5	EROSION AND SEDIMENT CONTROL NOTES	
CP-1	CATHODIC PROTECTION DETAILS AND BILL OF MATERIALS	
ACM-1	AC MITIGATION DETAILS	
ACM-2	AC MITIGATION DETAILS	
ACM-3	AC MITIGATION DETAILS AND BILL OF MATERIALS	
GT-1	GEOTECHNICAL BORE DATA	
GT-2	GEOTECHNICAL BORE DATA	
GT-3	GEOTECHNICAL BORE DATA	
GT-4	GEOTECHNICAL BORE DATA	
TC-0	TRAFFIC CONTROL KEY PLAN	
TC-1	TRAFFIC CONTROL NOTES, DRAWING LEGEND, AND PLAN AT CE-1	
TC-2	TRAFFIC CONTROL PLAN AT CONSTRUCTION ENTRANCE CE-1	
TC-3	TRAFFIC CONTROL PLAN AT CONSTRUCTION ENTRANCE CE-1	
TC-4	TRAFFIC CONTROL PLAN AT CONSTRUCTION ENTRANCE CE-1	
TC-5	TRAFFIC CONTROL PLAN AT CONSTRUCTION ENTRANCE CE-2	
TC-6	TRAFFIC CONTROL PLAN AT CONSTRUCTION ENTRANCE CE-2	

Sheet Number	Sheet Description	Date
TC-7	TRAFFIC CONTROL PLAN AT CONSTRUCTION ENTRANCE CE-2	
TC-8	TRAFFIC CONTROL PLAN AT CONSTRUCTION ENTRANCE CE-2	
TC-9	TRAFFIC CONTROL PLAN AT CONSTRUCTION ENTRANCE CE-2	
TC-10	TRAFFIC CONTROL PLAN AT CONSTRUCTION ENTRANCE CE-4	
TC-11	TRAFFIC CONTROL PLAN AT CONSTRUCTION ENTRANCE CE-4	
TC-12	TRAFFIC CONTROL PLAN AT CONSTRUCTION ENTRANCE CE-4	
TC-13	TRAFFIC CONTROL PLAN AT CONSTRUCTION ENTRANCE CE-4	
TC-14	TRAFFIC CONTROL PLAN AT CONSTRUCTION ENTRANCE CE-5	
TC-15	TRAFFIC CONTROL PLAN AT CONSTRUCTION ENTRANCE CE-5	
TC-16	TRAFFIC CONTROL PLAN AT CONSTRUCTION ENTRANCE CE-5	
TC-17	STANDARD TRAFFIC CONTROL DETAILS	

2. GCP89 – Highway 43 District Regulator Station, dated June 1, 2015.

Sheet Number	Sheet Description	Date
DR1-0	COVER SHEET	
DR1-1	BILL OF MATERIALS, DRAWING LEGEND AND GENERAL NOTES	
DR1-2	EXISTING CONDITIONS PLAN	
DR1-3	EXISTING SITE CONDITIONS PLAN	
DR1-4	PROPOSED SITE PLAN	
DR1-5	PROPOSED SITE GRADING PLAN	
DR1-6	PROPOSED SITE PLAN DETAIL	
DR1-7	PROPOSED PIPING PLAN	
DR1-8	PIPING SECTION AND DETAILS	
DR1-9	PIPELIN SECTION AND TIE-IN DETAIL	
DR1-10	PIPING SECTION	
DR1-11	PIPING SECTION AND DETAIL	

3. GCP89 – Old River Road District Regulator Station, dated June 1, 2015.

Sheet Number	Sheet Description	Date
DR2-0	COVER SHEET	
DR2-1	BILL OF MATERIALS, DRAWING LEGEND AND GENERAL NOTES	
DR2-2	EXISTING CONDITIONS PLAN	
DR2-3	PROPOSED SITE GRADING PLAN	
DR2-4	PROPOSED SITE PLAN	
DR2-5	PROPOSED SITE PLAN DETAIL	
DR2-6	PROPOSED PIPING PLAN	
DR2-7	PIPING SECTION AND DETAILS	
DR2-8	PIPING SECTION AND DETAILS	
DR2-9	PIPING SECTION	
DR2-10	PIPING SECTION AND DETAIL	

END OF DOCUMENT 000115

Section J

Notice to Proceed

NOTICE TO PROCEED

Owner:	Greenville Utilities Commission	Owner's Contract No.:	
Contractor:		Contractor's Project No.:	
Engineer:	Rummel, Klepper & Kahl, LLP	Engineer's Project No.:	1214-011
Project:	GCP89 – Northwestern Loop HP Gas Main Extension	Contract Name:	
		Effective Date of Contract:	

TO CONTRACTOR:

Owner hereby notifies Contractor that the Contract Times under the above Contract will commence to run on or before [_____, 20__].

On that date, Contractor shall start performing its obligations under the Contract Documents. In accordance with the Agreement, the number of days to achieve readiness for final payment is 120 calendar days.

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

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

Owner:

Greenville Utilities Commission

By: _____
Anthony C. Cannon

Title: General Manager / CEO

Date Issued: _____

Copy: Engineer

Section K

Performance and Payment Bonds

PERFORMANCE BOND

CONTRACTOR *(name and address):*

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

OWNER *(name and address):*

Greenville Utilities Commission

P.O. Box 1847

Greenville, North Carolina 27835-1847

CONSTRUCTION CONTRACT

Effective Date of the Agreement:

Amount:

Description *(name and location)*: **GCP89 – Northwestern Loop High Pressure Gas Main Extension,
Pitt County, North Carolina**

BOND

Bond Number:

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

Amount:

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

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

CONTRACTOR AS PRINCIPAL

SURETY

(seal)

Contractor's Name and Corporate Seal

By: _____
Signature

Print Name

Title

Attest: _____
Signature

Title

(seal)

Surety's Name and Corporate Seal

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

Print Name

Title

Attest: _____
Signature

Title

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

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

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

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

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

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

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

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

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

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

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

5.3 Obtain bids or negotiated proposals from qualified contractors acceptable to the Owner for a contract for performance and completion of the Construction Contract,

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

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

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

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

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

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

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

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

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

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

9. The Surety shall not be liable to the Owner or others for obligations of the Contractor that are unrelated to the Construction Contract, and the Balance of the Contract Price shall not be reduced

or set off on account of any such unrelated obligations. No right of action shall accrue on this Bond to any person or entity other than the Owner or its heirs, executors, administrators, successors, and assigns.

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

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

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

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

14. Definitions

14.1 Balance of the Contract Price: The total amount payable by the Owner to the Contractor under the Construction

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

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

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

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

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

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

16. Modifications to this Bond are as follows:

PAYMENT BOND

CONTRACTOR *(name and address)*:

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

OWNER *(name and address)*:

**Greenville Utilities Commission
P.O. Box 1847
Greenville, North Carolina 27835-1847**

CONSTRUCTION CONTRACT

Effective Date of the Agreement:

Amount:

Description *(name and location)*: **GCP89 – Northwestern Loop High Pressure Gas Main Extension,
Pitt County, North Carolina**

BOND

Bond Number:

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

Amount:

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

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

CONTRACTOR AS PRINCIPAL

SURETY

Contractor's Name and Corporate Seal

Surety's Name and Corporate Seal

By: _____
Signature

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

Print Name

Print Name

Title

Title

Attest: _____
Signature

Attest: _____
Signature

Title

Title

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

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

11. The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders, and other obligations.
12. No suit or action shall be commenced by a Claimant under this Bond other than in a court of competent jurisdiction in the state in which the project that is the subject of the Construction Contract is located or after the expiration of one year from the date (1) on which the Claimant sent a Claim to the Surety pursuant to Paragraph 5.1.2 or 5.2, or (2) on which the last labor or service was performed by anyone or the last materials or equipment were furnished by anyone under the Construction Contract, whichever of (1) or (2) first occurs. If the provisions of this paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.
13. Notice and Claims to the Surety, the Owner, or the Contractor shall be mailed or delivered to the address shown on the page on which their signature appears. Actual receipt of notice or Claims, however accomplished, shall be sufficient compliance as of the date received.
14. When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. When so furnished, the intent is that this Bond shall be construed as a statutory bond and not as a common law bond.
15. Upon requests by any person or entity appearing to be a potential beneficiary of this Bond, the Contractor and Owner shall promptly furnish a copy of this Bond or shall permit a copy to be made.
16. **Definitions**
 - 16.1 **Claim:** A written statement by the Claimant including at a minimum:
 1. The name of the Claimant;
 2. The name of the person for whom the labor was done, or materials or equipment furnished;
 3. A copy of the agreement or purchase order pursuant to which labor, materials, or equipment was furnished for use in the performance of the Construction Contract;
 4. A brief description of the labor, materials, or equipment furnished;
 5. The date on which the Claimant last performed labor or last furnished materials or equipment for use in the performance of the Construction Contract;
 6. The total amount earned by the Claimant for labor, materials, or equipment furnished as of the date of the Claim;
 - 16.2 **Claimant:** An individual or entity having a direct contract with the Contractor or with a subcontractor of the Contractor to furnish labor, materials, or equipment for use in the performance of the Construction Contract. The term Claimant also includes any individual or entity that has rightfully asserted a claim under an applicable mechanic's lien or similar statute against the real property upon which the Project is located. The intent of this Bond shall be to include without limitation in the terms of "labor, materials, or equipment" that part of the water, gas, power, light, heat, oil, gasoline, telephone service, or rental equipment used in the Construction Contract, architectural and engineering services required for performance of the work of the Contractor and the Contractor's subcontractors, and all other items for which a mechanic's lien may be asserted in the jurisdiction where the labor, materials, or equipment were furnished.
 - 16.3 **Construction Contract:** The agreement between the Owner and Contractor identified on the cover page, including all Contract Documents and all changes made to the agreement and the Contract Documents.
 - 16.4 **Owner Default:** Failure of the Owner, which has not been remedied or waived, to pay the Contractor as required under the Construction Contract or to perform and complete or comply with the other material terms of the Construction Contract.
 - 16.5 **Contract Documents:** All the documents that comprise the agreement between the Owner and Contractor.
7. The total amount of previous payments received by the Claimant; and
8. The total amount due and unpaid to the Claimant for labor, materials, or equipment furnished as of the date of the Claim.
17. If this Bond is issued for an agreement between a contractor and subcontractor, the term Contractor in this Bond shall be deemed to be Subcontractor and the term Owner shall be deemed to be Contractor.
18. Modifications to this Bond are as follows:

Section L

Insurance Exhibit

ACORDTM CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY)

PRODUCER	THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW.	
	INSURERS AFFORDING COVERAGE	NAIC #
INSURED	INSURER A:	
	INSURER B:	
	INSURER C:	
	INSURER D:	
	INSURER E:	

COVERAGES

THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. AGGREGATE LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR (ADD'L LTR)	INSRD	TYPE OF INSURANCE	POLICY NUMBER	POLICY EFFECTIVE DATE (MM/DD/YY)	POLICY EXPIRATION DATE (MM/DD/YY)	LIMITS	
		GENERAL LIABILITY ☐ COMMERCIAL GENERAL LIABILITY ☐ CLAIMS MADE ☐ OCCUR GEN'L AGGREGATE LIMIT APPLIES PER: ☐ POLICY ☐ PRO-JECT ☐ LOC				EACH OCCURRENCE	\$
						DAMAGE TO RENTED PREMISES (Ea occurrence)	\$
						MED EXP (Any one person)	\$
						PERSONAL & ADV INJURY	\$
						GENERAL AGGREGATE	\$
						PRODUCTS - COMP/OP AGG	\$
		AUTOMOBILE LIABILITY ☐ ANY AUTO ☐ ALL OWNED AUTOS ☐ SCHEDULED AUTOS ☐ HIRED AUTOS ☐ NON-OWNED AUTOS				COMBINED SINGLE LIMIT (Ea accident)	\$
						BODILY INJURY (Per person)	\$
						BODILY INJURY (Per accident)	\$
						PROPERTY DAMAGE (Per accident)	\$
		GARAGE LIABILITY ☐ ANY AUTO				AUTO ONLY - EA ACCIDENT	\$
						OTHER THAN AUTO ONLY: EA ACC	\$
						AGG	\$
		EXCESS/UMBRELLA LIABILITY ☐ OCCUR ☐ CLAIMS MADE DEDUCTIBLE RETENTION \$				EACH OCCURRENCE	\$
						AGGREGATE	\$
							\$
							\$
							\$
		WORKERS COMPENSATION AND EMPLOYERS' LIABILITY ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? If yes, describe under SPECIAL PROVISIONS below OTHER				WC STATUTORY LIMITS	OTH-ER
						E.L. EACH ACCIDENT	\$
						E.L. DISEASE - EA EMPLOYEE	\$
						DISEASE - POLICY LIMIT	\$

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES / EXCLUSIONS ADDED BY ENDORSEMENT / SPECIAL PROVISIONS

CERTIFICATE HOLDER**CANCELLATION**

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, THE ISSUING INSURER WILL ENDEAVOR TO MAIL _____ DAYS WRITTEN NOTICE TO THE CERTIFICATE HOLDER NAMED TO THE LEFT, BUT FAILURE TO DO SO SHALL IMPOSE NO OBLIGATION OR LIABILITY OF ANY KIND UPON THE INSURER, ITS AGENTS OR REPRESENTATIVES.

AUTHORIZED REPRESENTATIVE

IMPORTANT

If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must be endorsed. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

DISCLAIMER

The Certificate of Insurance on the reverse side of this form does not constitute a contract between the issuing insurer(s), authorized representative or producer, and the certificate holder, nor does it affirmatively or negatively amend, extend or alter the coverage afforded by the policies listed thereon.

Section M

Certificate of Finance Officer

CERTIFICATE OF FINANCE OFFICER

Provisions for the payment of the monies to fall due under this agreement have been made by appropriation duly made or by bonds or notes duly authorized, as required by the "Local Government Budget and Fiscal Control Act".

Finance Officer

Date: _____

Section N

Certificate of Owner's Attorney

CERTIFICATE OF OWNER'S ATTORNEY

I, the undersigned, _____, the duly authorized and acting legal representative of **The Greenville Utilities Commission of the City of Greenville, North Carolina** do hereby certify as follows:

I have examined the foregoing contract and surety bonds and the manner of execution thereof, and I am of the opinion that each of the aforesaid agreements 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.

Commission Attorney: Phillip R. Dixon

Date

Section O

Contractor's Application for Payment



Contractor's Application for Payment No. _____

Application Period:		Application Date:
To (Owner):	Greenville Utilities Commission	Via (Engineer): Rummel, Klepper & Kahl, LLP
Project:	CGP89 - Northwestern Loop High Pressure Gas Main Extension	
Owner's Contract No.:	Contractor's Project No.:	Engineer's Project No.: 1214-011

Application For Payment Change Order Summary

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

Contractor's Certification

The undersigned Contractor certifies, to the best of its knowledge, the following:

(1) All previous progress payments received from Owner on account of Work done under the Contract have been applied on account to discharge Contractor's legitimate obligations incurred in connection with the Work covered by prior Applications for Payment;

(2) Title to all Work, materials and equipment incorporated in said Work, or otherwise listed in or covered by this Application for Payment, will pass to Owner at time of payment free and clear of all Liens, security interests, and encumbrances (except such as are covered by a bond acceptable to Owner indemnifying Owner against any such Liens, security interest, or encumbrances); and

(3) All the Work covered by this Application for Payment is in accordance with the Contract Documents and is not defective.

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 or Financing Entity (if applicable)	(Date)
Contractor Signature		
By:	Date:	

Progress Estimate - Unit Price Work

Contractor's Application

[illegible]

Stored Material Summary

Contractor's Application

[illegible]

Section P

Certificate of Substantial Completion

CERTIFICATE OF SUBSTANTIAL COMPLETION

Owner: Greenville Utilities Commission	Owner's Contract No.:
Contractor:	Contractor's Project No.:
Engineer: Rummel, Klepper & Kahl, LLP	Engineer's Project No.: 1214-011
Project: GCP89 - Northwestern Loop High Pressure Gas Main Extension	Contract Name:

This [preliminary] [final] Certificate of Substantial Completion applies to:

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

Date of Substantial Completion

The Work to which this Certificate applies has been inspected by authorized representatives of Owner, Contractor, and Engineer, and found to be substantially complete. The Date of Substantial Completion of the 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.

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 shall be as provided in the Contract, except as amended as follows: *[Note: 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.]*

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: *[punch list; others]*

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.

EXECUTED BY ENGINEER:	RECEIVED:	RECEIVED:
By: _____ (Authorized signature)	By: _____ Owner (Authorized Signature)	By: _____ Contractor (Authorized Signature)
Title: _____	Title: _____	Title: _____
Date: _____	Date: _____	Date: _____

Section Q

General Conditions

STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

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ARTICLE 1 – DEFINITIONS AND TERMINOLOGY

1.01 *Defined Terms*

- A. Wherever used in the Bidding Requirements or Contract Documents, 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 form acceptable to Engineer which is to be used by Contractor during the course of the Work in requesting progress or final payments and which is to be accompanied by such supporting documentation as is required by the Contract Documents.
 4. *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, or both; 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, or both; contesting an initial decision by Engineer concerning the requirements of the Contract Documents or the acceptability of Work under the Contract Documents; contesting Engineer's decision regarding a Change Proposal; seeking resolution of a contractual issue that Engineer has declined to address; or seeking other relief with respect to the terms of the Contract; or (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. 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), hazardous waste, and any substance, product, waste, or other material of any nature whatsoever that is or becomes listed, regulated, or addressed pursuant to (a) the Comprehensive Environmental Response, Compensation and Liability Act, 42 U.S.C. §§9601 et seq. (“CERCLA”); (b) the Hazardous Materials Transportation Act, 49 U.S.C. §§5501 et seq.; (c) the Resource Conservation and Recovery Act, 42 U.S.C. §§6901 et seq. (“RCRA”); (d) the Toxic Substances Control Act, 15 U.S.C. §§2601 et seq.; (e) the Clean Water Act, 33 U.S.C. §§1251 et seq.; (f) the Clean Air Act, 42 U.S.C. §§7401 et seq.; or (g) any other federal, state, or local statute, law, rule, regulation, ordinance, resolution, code, order, or decree regulating, relating to, or imposing liability or standards of conduct concerning, any hazardous, toxic, or dangerous waste, substance, or material.
12. *Contract*—The entire and integrated written contract between the 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. Also referred to as the Project Plans in sections of the Project Specifications.
19. *Effective Date of the Contract*—The date, indicated in the Agreement, on which the Contract becomes effective.
20. *Engineer*—The individual or entity named as such in the Agreement.
21. *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.
22. *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. The presence at the Site of materials that are necessary for the execution of the Work, or that are to be incorporated in the Work, and that are controlled and contained pursuant to industry practices, Laws and Regulations, and the requirements of the Contract, does not establish a Hazardous Environmental Condition.
23. *Laws and Regulations; Laws or Regulations*—Any and all applicable laws, statutes, rules, regulations, ordinances, codes, and orders of any and all governmental bodies, agencies, authorities, and courts having jurisdiction.

24. *Liens*—Charges, security interests, or encumbrances upon Contract-related funds, real property, or personal property.
25. *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.
26. *Notice of Award*—The written notice by Owner to a Bidder of Owner's acceptance of the Bid.
27. *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.
28. *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.
29. *Progress Schedule*—A schedule, prepared and maintained by Contractor, describing the sequence and duration of the activities comprising the Contractor's plan to accomplish the Work within the Contract Times.
30. *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.
31. *Project Manual*—The written documents prepared for, or made available for, procuring and constructing the Work, including but not limited to the Bidding Documents or other construction procurement documents, geotechnical and existing conditions information, the Agreement, bond forms, General Conditions, Supplementary Conditions, and Specifications. The contents of the Project Manual may be bound in one or more volumes.
32. *Resident Project Representative*—The authorized representative of Engineer assigned to assist Engineer at the Site. As used herein, the term Resident Project Representative or "RPR" includes any assistants or field staff of Resident Project Representative.
33. *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.
34. *Schedule of Submittals*—A schedule, prepared and maintained by Contractor, of required submittals and the time requirements for Engineer's review of the submittals and the performance of related construction activities.
35. *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.
36. *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.

37. *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 furnished by Owner which are designated for the use of Contractor.
38. *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.
39. *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.
40. *Substantial Completion*—The time at which the Work (or a specified part thereof) has progressed to the point where, in the opinion of Engineer, the Work (or a specified part thereof) is sufficiently complete, in accordance with the Contract Documents, so that the Work (or a specified part thereof) can be utilized for the purposes for which it is intended. The terms “substantially complete” and “substantially completed” as applied to all or part of the Work refer to Substantial Completion thereof.
41. *Successful Bidder*—The Bidder whose Bid the Owner accepts, and to which the Owner makes an award of contract, subject to stated conditions.
42. *Supplementary Conditions*—The part of the Contract that amends or supplements these General Conditions.
43. *Supplier*—A manufacturer, fabricator, supplier, distributor, materialman, or vendor having a direct contract with Contractor or with any Subcontractor to furnish materials or equipment to be incorporated in the Work by Contractor or a Subcontractor.
44. *Technical Data*—Those items expressly identified as Technical Data in the Supplementary Conditions, with respect to either (a) subsurface conditions at the Site, or physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities) or (b) Hazardous Environmental Conditions at the Site. If no such express identifications of Technical Data have been made with respect to conditions at the Site, then the data contained in boring logs, recorded measurements of subsurface water levels, laboratory test results, and other factual, objective information regarding conditions at the Site that are set forth in any geotechnical or environmental report prepared for the Project and made available to Contractor are hereby defined as Technical Data with respect to conditions at the Site under Paragraphs 5.03, 5.04, and 5.06.
45. *Underground Facilities*—All underground pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels, or other such facilities or attachments, and any encasements containing such facilities, including but not limited to those that convey electricity, gases, steam, liquid petroleum products, telephone or other communications, fiber optic transmissions, cable television, water, wastewater, storm water, other liquids or chemicals, or traffic or other control systems.
46. *Unit Price Work*—Work to be paid for on the basis of unit prices.
47. *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.

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

1.02 Terminology

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

3. The words “perform” or “provide,” when used in connection with services, materials, or equipment, shall mean to furnish and install said services, materials, or equipment complete and ready for intended use.
 4. If the Contract Documents establish an obligation of Contractor with respect to specific services, materials, or equipment, but do not expressly use any of the four words “furnish,” “install,” “perform,” or “provide,” then Contractor shall furnish and install said services, materials, or equipment complete and ready for intended use.
- F. Unless stated otherwise in the Contract Documents, words or phrases that have a well-known technical or construction industry or trade meaning are used in the Contract Documents in accordance with such recognized meaning.

ARTICLE 2 – PRELIMINARY MATTERS

2.01 *Delivery of Bonds and Evidence of Insurance*

- A. *Bonds*: When Contractor delivers the executed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner such bonds as Contractor may be required to furnish.
- B. *Evidence of Contractor’s Insurance*: When Contractor delivers the executed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner, with copies to each named insured and additional insured (as identified in the Supplementary Conditions or elsewhere in the Contract), the certificates and other evidence of insurance required to be provided by Contractor in accordance with Article 6.
- C. *Evidence of Owner’s Insurance*: After receipt of the executed counterparts of the Agreement and all required bonds and insurance documentation, Owner shall promptly deliver to Contractor, with copies to each named insured and additional insured (as identified in the Supplementary Conditions or otherwise), 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 executed 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 specifically required by the Contract Documents), Contractor shall submit to Engineer for timely review:
 1. a preliminary Progress Schedule indicating the times (numbers of days or dates) for starting and completing the various stages of the Work, including any Milestones specified in the Contract;
 2. a preliminary Schedule of Submittals; and

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

2.04 *Preconstruction Conference; Designation of Authorized Representatives*

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

2.05 *Initial Acceptance of Schedules*

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

2.06 *Electronic Transmittals*

- A. Except as otherwise stated elsewhere in the Contract, the Owner, Engineer, and Contractor may transmit, and shall accept, Project-related correspondence, text, data, documents, drawings, information, and graphics, including but not limited to Shop Drawings and other submittals, in electronic media or digital format, either directly, or through access to a secure Project website.
- B. If the Contract does not establish protocols for electronic or digital transmittals, then Owner, Engineer, and Contractor shall jointly develop such protocols.
- C. When transmitting items in electronic media or digital format, the transmitting party makes no representations as to long term compatibility, usability, or readability of the items 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 items, or from those established in applicable transmittal protocols.

ARTICLE 3 – DOCUMENTS: INTENT, REQUIREMENTS, REUSE

3.01 *Intent*

- A. The Contract Documents are complementary; what is required by one 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 or digital versions of the Contract Documents (including any printed copies derived from such electronic or digital versions) and the printed record version, the printed record version shall govern.
- D. The Contract supersedes prior negotiations, representations, and agreements, whether written or oral.
- E. Engineer will issue clarifications and interpretations of the Contract Documents as provided herein.

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, shall mean the standard specification, manual, reference standard, code, or Laws or Regulations in effect at the time of opening of Bids (or on the Effective Date of the Contract if there were no Bids), except as may be otherwise specifically stated in the Contract Documents.
 - 2. No provision of any such standard specification, manual, reference standard, or code, or any instruction of a Supplier, shall be effective to change the duties or responsibilities of Owner, Contractor, or Engineer, or any of their subcontractors, consultants, agents, or employees, from those set forth in the part of the Contract Documents prepared by or for Engineer. No such provision or instruction shall be effective to assign to Owner, Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, any duty or authority to supervise or direct the performance of the Work or any duty or authority to undertake responsibility inconsistent with the provisions of the 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 Documents 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 Documents 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 shall take precedence in resolving any conflict, error, ambiguity, or discrepancy between such provisions of the Contract Documents and:
 - a. the provisions of any standard specification, manual, reference standard, or code, or the instruction of any Supplier (whether or not specifically incorporated by reference as a Contract Document); or
 - b. the provisions of any Laws or Regulations applicable to the performance of the Work (unless such an interpretation of the provisions of the Contract Documents would result in violation of such Law or Regulation).

3.04 *Requirements of the Contract Documents*

- A. During the performance of the Work and until final payment, Contractor and Owner shall submit to the Engineer 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 thereunder.
- 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 give written notice to Owner and Contractor 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 editions, 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 shall preclude 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 thirtieth 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 sixtieth day after the day of Bid opening or the thirtieth day after the Effective Date of the Contract, whichever date is earlier.

4.02 *Starting the Work*

- A. Contractor shall start to perform the Work on the date when the Contract Times commence to run. No Work shall 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 shall 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 shall 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 the Contract Times and Contract Price. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times.
- 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. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times. Such an adjustment shall be Contractor's sole and exclusive remedy for the delays, disruption, and interference described in this paragraph. Causes of delay, disruption, or interference that may give rise to an adjustment in Contract Times under this paragraph include but are not limited to the following:
 1. severe and unavoidable natural catastrophes such as fires, floods, epidemics, and earthquakes;
 2. abnormal weather conditions;
 3. acts or failures to act of utility owners (other than those performing other work at or adjacent to the Site by arrangement with the Owner, as contemplated in Article 8); and
 4. acts of war or terrorism.
- D. 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.
- E. Paragraph 8.03 governs 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.
- F. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times 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.

- G. Contractor must submit any Change Proposal seeking an adjustment in Contract Price or Contract Times under this paragraph within 30 days of the commencement of the delaying, disrupting, or interfering event.

ARTICLE 5 – AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS ENVIRONMENTAL CONDITIONS

5.01 *Availability of Lands*

- A. Owner shall furnish the Site. Owner shall notify Contractor of any encumbrances or restrictions not of general application but specifically related to use of the Site with which Contractor must comply in performing the Work.
- 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; 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 7.12, 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 at law; and (c) to the fullest extent permitted by Laws and Regulations, indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against any such claim, and against all costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any claim or action, legal or equitable, brought by any such owner or occupant against Owner, Engineer, or any other party indemnified hereunder to the extent caused directly or indirectly, in whole or in part

by, or based upon, Contractor's performance of the Work, or because of other actions or conduct of the Contractor or those for which Contractor is responsible.

- B. *Removal of Debris During Performance of the Work:* During the progress of the Work the Contractor shall keep the Site and other adjacent areas free from accumulations of waste materials, rubbish, and other debris. Removal and disposal of such waste materials, rubbish, and other debris shall conform to applicable Laws and Regulations.
- C. *Cleaning:* Prior to Substantial Completion of the Work Contractor shall clean the Site and the Work and make it ready for utilization by Owner. At the completion of the Work Contractor shall remove from the Site 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 known to Owner of explorations and tests of subsurface conditions at or adjacent to the Site;
 - 2. those drawings known to Owner of physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities); 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 upon the accuracy of the Technical Data (as defined in Article 1) contained in any geotechnical or environmental report prepared for the Project and made available to Contractor. 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; or
 - 2. other data, interpretations, opinions, and information contained in such reports or shown or indicated in such drawings; or
 - 3. any Contractor interpretation of or conclusion drawn from any Technical Data or any such other data, interpretations, opinions, or information.

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 either:
1. is of such a nature as to establish that any Technical Data on which Contractor is entitled to rely as provided in Paragraph 5.03 is materially inaccurate; or
 2. is of such a nature as to require a change in the Drawings or Specifications; or
 3. differs materially from that shown or indicated in the Contract Documents; or
 4. is of an unusual nature, and differs materially from conditions ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract Documents;

then Contractor shall, promptly after becoming aware thereof and before further disturbing the subsurface or physical conditions or performing any Work in connection therewith (except in an emergency as required by Paragraph 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 the necessity of Owner's obtaining 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 above; 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. *Possible Price and Times Adjustments:*
1. Contractor shall be entitled to an equitable adjustment in Contract Price or Contract Times, or both, 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 conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times.
- 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; or
 - 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 as 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, or both, then any such adjustment shall 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, or both, 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.

5.05 *Underground Facilities*

- A. *Contractor's Responsibilities:* The information and data shown or indicated in the Contract Documents with respect to existing Underground Facilities at or adjacent to the Site is based on information and data furnished to Owner or Engineer by the owners of such Underground Facilities, including Owner, or by others. Unless it is otherwise expressly provided in the Supplementary Conditions:
 - 1. Owner and Engineer do not warrant or guarantee the accuracy or completeness of any such information or data provided by others; and
 - 2. the cost of all of the following will be included in the Contract Price, and Contractor shall have full responsibility for:
 - a. reviewing and checking all information and data regarding existing Underground Facilities at the Site;
 - b. locating all Underground Facilities shown or indicated in the Contract Documents as being at the Site;
 - c. coordination of the Work with the owners (including Owner) of such Underground Facilities, during construction; and
 - d. 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 in the Contract Documents, or was not shown or indicated 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), identify the owner of such Underground Facility and give written notice to that owner and to Owner and Engineer.

- C. *Engineer's Review:* Engineer will promptly review the Underground Facility and conclude whether such Underground Facility was not shown or indicated in the Contract Documents, or was not shown or indicated with reasonable accuracy; obtain any pertinent cost or schedule information from Contractor; prepare recommendations to Owner regarding the Contractor's resumption of Work in connection with the Underground Facility in question; 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 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. *Possible Price and Times Adjustments:*
 - 1. Contractor shall be entitled to an equitable adjustment in the Contract Price or Contract Times, or both, to the extent that any existing Underground Facility at the Site that was not shown or indicated in the Contract Documents, 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. Contractor did not know of and could not reasonably have been expected to be aware of or to have anticipated the existence or actual location of the Underground Facility in question;
 - 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;
 - c. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times; and
 - d. 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, or both, then any such adjustment shall 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, or both, no later than 30 days after Owner's issuance of the Owner's written statement to Contractor regarding the Underground Facility in question.

5.06 *Hazardous Environmental Conditions at Site*

- A. *Reports and Drawings:* The Supplementary Conditions identify:
1. those reports and drawings known to Owner relating to Hazardous Environmental Conditions that have been identified at or adjacent to the Site; and
 2. 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 Article 1) contained in any geotechnical or environmental report prepared for the Project and made available to Contractor. 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; or
 2. other data, interpretations, opinions and information contained in such reports or shown or indicated in such drawings; or
 3. any Contractor interpretation of or conclusion drawn from any Technical Data or any such other data, interpretations, opinions or information.
- C. Contractor shall not be responsible for 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, or both, as a result of such Work stoppage or such special conditions under which Work is agreed to be resumed by Contractor, 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.
- 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 or 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.H shall obligate 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 shall obligate 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 all of Contractor's obligations under the Contract. These bonds shall remain in effect until one year after the date when final payment becomes due or until completion of the correction period specified in Paragraph 15.08, whichever is later, except as provided otherwise by Laws or Regulations, the Supplementary Conditions, or other specific provisions of the Contract. Contractor shall also furnish such other bonds as are required by the Supplementary Conditions or other specific provisions of the Contract.
- B. All bonds shall be in the form prescribed by the Contract except as provided otherwise by Laws or Regulations, and shall be executed by such sureties as are named in "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Circular 570 (as amended and supplemented) by the Financial Management Service, Surety Bond Branch, 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 shall show that it is effective on the date the agent or attorney-in-fact signed the accompanying bond.
- C. Contractor shall obtain the required bonds from surety companies that are duly licensed or authorized in the jurisdiction in which the Project is located to issue bonds in the required amounts.
- D. If the surety on a bond furnished by Contractor is declared bankrupt or becomes insolvent, or its right to do business is terminated in any state or jurisdiction where any part of the Project is located, or the surety ceases to meet the requirements above, then Contractor shall promptly notify Owner and Engineer and shall, within 20 days after the event giving rise to such notification, provide another bond and surety, both of which shall comply with the bond and surety requirements above.
- E. 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.
- F. Upon request, Owner shall provide a copy of the payment bond to any Subcontractor, Supplier, or other person or entity claiming to have furnished labor or materials used in the performance of the Work.

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. Contractor shall deliver to Owner, with copies to each named insured and additional insured (as identified in this Article, in the Supplementary Conditions, or elsewhere in the Contract), certificates of insurance establishing that Contractor has obtained and is

maintaining the policies, coverages, and endorsements 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 and endorsements, and documentation of applicable self-insured retentions and deductibles. Contractor may block out (redact) any confidential premium or pricing information contained in any policy or endorsement furnished under this provision.

- D. Owner shall deliver to Contractor, with copies to each named insured and additional insured (as identified in this Article, the Supplementary Conditions, or elsewhere in the Contract), certificates of insurance establishing that Owner has obtained and is maintaining the policies, coverages, and endorsements 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 and endorsements, and documentation of applicable self-insured retentions and deductibles. Owner may block out (redact) any confidential premium or pricing information contained in any policy or endorsement furnished under this provision.
- E. 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, shall not be construed as a waiver of the other party's obligation to obtain and maintain such insurance.
- F. If either party does not purchase or maintain all of 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.
- G. If Contractor has failed to obtain and maintain required insurance, Owner may exclude the Contractor from the Site, impose an appropriate set-off against payment, and exercise Owner's termination rights under Article 16.
- H. Without prejudice to any other right or remedy, if a party has failed to obtain required insurance, the other party may elect 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 shall be adjusted accordingly.
- I. Owner does not represent that insurance coverage and limits established in this Contract necessarily will be adequate to protect Contractor or Contractor's interests.
- J. The insurance and insurance limits required herein shall not be deemed as a limitation on Contractor's liability under the indemnities granted to Owner and other individuals and entities in the Contract.

6.03 *Contractor's Insurance*

- A. *Workers' Compensation:* Contractor shall purchase and maintain workers' compensation and employer's liability insurance for:
 - 1. claims under workers' compensation, disability benefits, and other similar employee benefit acts.
 - 2. United States Longshoreman and Harbor Workers' Compensation Act and Jones Act coverage (if applicable).
 - 3. claims for damages because of bodily injury, occupational sickness or disease, or death of Contractor's employees (by stop-gap endorsement in monopolist worker's compensation states).

4. Foreign voluntary worker compensation (if applicable).
- B. *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:
1. claims for damages because of bodily injury, sickness or disease, or death of any person other than Contractor's employees.
 2. claims for damages insured by reasonably available personal injury liability coverage.
 3. claims for damages, other than to the Work itself, because of injury to or destruction of tangible property wherever located, including loss of use resulting therefrom.
- C. *Commercial General Liability—Form and Content:* Contractor's commercial liability policy shall be written on a 1996 (or later) ISO commercial general liability form (occurrence form) and include the following coverages and endorsements:
1. Products and completed operations coverage:
 - a. Such insurance shall be maintained for three years after final payment.
 - b. Contractor shall furnish Owner and each other additional insured (as identified in the Supplementary Conditions or elsewhere in the Contract) evidence of continuation of such insurance at final payment and three years thereafter.
 2. Blanket contractual liability coverage, to the extent permitted by law, including but not limited to coverage of Contractor's contractual indemnity obligations in Paragraph 7.18.
 3. Broad form property damage coverage.
 4. Severability of interest.
 5. Underground, explosion, and collapse coverage.
 6. Personal injury coverage.
 7. 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); or CG 20 10 07 04 and CG 20 37 07 04 (together); or their equivalent.
 8. 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.
- D. *Automobile liability:* Contractor shall purchase and maintain automobile liability insurance against claims for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance, or use of any motor vehicle. The automobile liability policy shall be written on an occurrence basis.
- E. *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. Subject to industry-standard exclusions, the coverage afforded shall follow form as to each and every one of the underlying policies.
- F. *Contractor's pollution liability insurance:* Contractor shall purchase and maintain a policy covering third-party injury and property damage claims, including clean-up costs, as a result

of pollution conditions arising from Contractor's operations and completed operations. This insurance shall be maintained for no less than three years after final completion.

- G. *Additional insureds*: The Contractor's commercial general liability, automobile liability, umbrella or excess, and pollution liability policies shall include and list as additional insureds Owner and Engineer, and any individuals or entities identified in the Supplementary Conditions; include coverage for the respective officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of all such additional insureds; and the insurance afforded to these additional insureds shall provide primary coverage for all claims covered thereby (including as applicable those arising from both ongoing and completed operations) on a non-contributory basis. Contractor shall obtain all necessary endorsements to support these requirements.
- H. *Contractor's professional liability insurance*: If Contractor will provide or furnish professional services under this Contract, through a delegation of professional design services or otherwise, then Contractor shall be responsible for purchasing and maintaining applicable professional liability insurance. This insurance shall provide protection against claims arising out of performance of professional design or related services, and caused by a negligent error, omission, or act for which the insured party is legally liable. It shall be maintained throughout the duration of the Contract and for a minimum of two years after Substantial Completion. If such professional design services are performed by a Subcontractor, and not by Contractor itself, then the requirements of this paragraph may be satisfied through the purchasing and maintenance of such insurance by such Subcontractor.
- I. *General provisions*: The policies of insurance required by this Paragraph 6.03 shall:
 - 1. include at least the specific coverages provided in this Article.
 - 2. be written for not less than the limits of liability provided in this Article and in the Supplementary Conditions, or required by Laws or Regulations, whichever is greater.
 - 3. contain a provision or endorsement that the coverage afforded will not be canceled, materially changed, or renewal refused until at least 10 days prior written notice has been given to Contractor. Within three days of receipt of any such written notice, Contractor shall provide a copy of the notice to Owner, Engineer, and each other insured under the policy.
 - 4. remain in effect at least until final payment (and longer if expressly required in this Article) 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 Documents.
 - 5. be appropriate for the Work being performed and provide protection from claims that may arise out of or result from Contractor's performance of the Work and Contractor's other obligations under the Contract Documents, whether it is to be performed by Contractor, any Subcontractor or Supplier, or by anyone directly or indirectly employed by any of them to perform any of the Work, or by anyone for whose acts any of them may be liable.
- J. The coverage requirements for specific policies of insurance must be met by such policies, and not by reference to excess or umbrella insurance provided in other policies.

6.04 *Owner's Liability Insurance*

- A. In addition to the insurance required to be provided by Contractor under Paragraph 6.03, Owner, at Owner's option, may purchase and maintain at Owner's expense Owner's own liability insurance as will protect Owner against claims which may arise from operations under the Contract Documents.
- B. 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.

6.05 *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 full insurable replacement cost thereof (subject to such deductible amounts as may be provided in the Supplementary Conditions or required by Laws and Regulations). This insurance shall:
 - 1. include the Owner and Contractor as named insureds, and all Subcontractors, and any individuals or entities required by the Supplementary Conditions to be insured under such builder's risk policy, as insureds or named insureds. For purposes of the remainder of this Paragraph 6.05, Paragraphs 6.06 and 6.07, and any corresponding Supplementary Conditions, the parties required to be insured shall collectively be referred to as "insureds."
 - 2. be written on a builder's risk "all risk" policy form that shall at least include insurance for physical loss or damage to the Work, temporary buildings, falsework, and materials and equipment in transit, and shall insure against at least the following perils or causes of loss: fire; lightning; windstorm; riot; civil commotion; terrorism; vehicle impact; aircraft; smoke; theft; vandalism and malicious mischief; mechanical breakdown, boiler explosion, and artificially generated electric current; earthquake; volcanic activity, and other earth movement; flood; collapse; explosion; debris removal; demolition occasioned by enforcement of Laws and Regulations; water damage (other than that caused by flood); and such other perils or causes of loss as may be specifically required by the Supplementary Conditions. If insurance against mechanical breakdown, boiler explosion, and artificially generated electric current; earthquake; volcanic activity, and other earth movement; or flood, are not commercially available under builder's risk policies, by endorsement or otherwise, such insurance may be provided through other insurance policies acceptable to Owner and Contractor.
 - 3. cover, as insured property, at least the following: (a) the Work and all materials, supplies, machinery, apparatus, equipment, fixtures, and other property of a similar nature that are to be incorporated into or used in the preparation, fabrication, construction, erection, or completion of the Work, including Owner-furnished or assigned property; (b) spare parts inventory required within the scope of the Contract; and (c) temporary works which are not intended to form part of the permanent constructed Work but which are intended to provide working access to the Site, or to the Work under construction, or which are intended to provide temporary support for the Work under construction, including scaffolding, form work, fences, shoring, falsework, and temporary structures.
 - 4. cover expenses incurred in the repair or replacement of any insured property (including but not limited to fees and charges of engineers and architects).

5. extend to cover damage or loss to insured property while in temporary storage at the Site or in a storage location outside the Site (but not including property stored at the premises of a manufacturer or Supplier).
 6. extend to cover damage or loss to insured property while in transit.
 7. allow for partial occupation or use of the Work by Owner, such that those portions of the Work that are not yet occupied or used by Owner shall remain covered by the builder's risk insurance.
 8. allow for the waiver of the insurer's subrogation rights, as set forth below.
 9. provide primary coverage for all losses and damages caused by the perils or causes of loss covered.
 10. not include a co-insurance clause.
 11. include an exception for ensuing losses from physical damage or loss with respect to any defective workmanship, design, or materials exclusions.
 12. include performance/hot testing and start-up.
 13. be maintained in effect, subject to the provisions herein regarding Substantial Completion and partial occupancy or use of the Work by Owner, until the Work is complete.
- B. *Notice of Cancellation or Change:* All the policies of insurance (and the certificates or other evidence thereof) required to be purchased and maintained in accordance with this Paragraph 6.05 will contain a provision or endorsement that the coverage afforded will not be canceled or materially changed 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.
- C. *Deductibles:* The purchaser of any required builder's risk or property insurance shall pay for costs not covered because of the application of a policy deductible.
- 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 notice of such occupancy or use to the builder's risk insurer. The builder's risk insurance shall not be canceled or permitted to lapse on account of any such partial use or occupancy; rather, those portions of the Work that are occupied or used by Owner may come off the builder's risk policy, while those portions of the Work not yet occupied or used by Owner shall remain covered by the builder's risk insurance.
- E. *Additional Insurance:* 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 6.05, it may do so at Contractor's expense.
- F. *Insurance of Other Property:* If the express insurance provisions of the Contract do not require or address the insurance of a property item or interest, such as tools, construction equipment, or other personal property owned by Contractor, a Subcontractor, or an employee of Contractor or a Subcontractor, then the entity or individual owning such property item will be responsible for deciding whether to insure it, and if so in what amount.

6.06 *Waiver of Rights*

- A. All policies purchased in accordance with Paragraph 6.05, expressly including the builder's risk policy, shall contain provisions to the effect that in the event of payment of any loss or damage the insurers will have no rights of recovery against any insureds thereunder, or against Engineer or its consultants, or their officers, directors, members, partners, employees, agents, consultants, or subcontractors. 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 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 Subcontractors, all individuals or entities identified in the Supplementary Conditions as 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. None of the above waivers shall extend to the rights that any party making such waiver may have to the proceeds of insurance held by Owner or Contractor as trustee or fiduciary, or otherwise payable under any policy so issued.
- B. Owner waives all rights against Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them, for:
 - 1. loss due to business interruption, loss of use, or other consequential loss extending beyond direct physical loss or damage to Owner's property or the Work caused by, arising out of, or resulting from fire or other perils whether or not insured by Owner; and
 - 2. loss or damage to the completed Project or part thereof caused by, arising out of, or resulting from fire or other insured peril or cause of loss covered by any property insurance maintained on the completed Project or part thereof by Owner during partial 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.
- C. Any insurance policy maintained by Owner covering any loss, damage or consequential loss referred to in Paragraph 6.06.B shall contain provisions to the effect that in the event of payment of any such loss, damage, or consequential loss, the insurers will have no rights of recovery against Contractor, Subcontractors, or Engineer, or the officers, directors, members, partners, employees, agents, consultants, or subcontractors of each and any of them.
- D. Contractor shall be responsible for assuring that the agreement under which a Subcontractor performs a portion of the Work 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 any of the perils or causes of loss covered by builder's risk insurance and any other property insurance applicable to the Work.

6.07 *Receipt and Application of Property Insurance Proceeds*

- A. Any insured loss under the builder's risk and other policies of insurance required by Paragraph 6.05 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 6.05 shall 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, the damaged Work shall be repaired or replaced, the money so received applied on account thereof, and the Work and the cost thereof covered by Change Order, if needed.

ARTICLE 7 – CONTRACTOR'S RESPONSIBILITIES

7.01 *Supervision and Superintendence*

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

7.02 *Labor; Working Hours*

- A. Contractor shall provide competent, suitably qualified personnel to survey and lay out the Work and perform construction as required by the Contract Documents. Contractor shall at all times maintain good discipline and order at the Site.
- B. Except as otherwise required for the safety or protection of persons or the Work or property at the Site or adjacent thereto, and except as otherwise stated in the Contract Documents, all Work at the Site shall be performed during regular working hours, 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.

7.03 *Services, Materials, and Equipment*

- A. Unless otherwise specified in the Contract Documents, Contractor shall provide and assume full responsibility for all services, materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities, and all other facilities and incidentals necessary for the performance, testing, start up, and completion of the Work, whether or not such items are specifically called for in the Contract Documents.
- B. All materials and equipment incorporated into the Work shall be of good quality and new, except as otherwise provided in the Contract Documents. All special warranties and

guarantees required by the Specifications shall expressly run to the benefit of Owner. If required by Engineer, Contractor shall furnish satisfactory evidence (including reports of required tests) as to the source, kind, and quality of materials and equipment.

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

7.04 "Or Equals"

- A. Whenever an item of material or equipment is specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular Supplier, the 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 material or equipment, or items from other proposed suppliers under the circumstances described below.
 - 1. If Engineer in its sole discretion determines that an item of material or equipment proposed by Contractor is functionally equal to that named and sufficiently similar so that no change in related Work will be required, Engineer shall deem it an "or equal" item. For the purposes of this paragraph, a proposed item of material or equipment will be considered functionally equal to an item so named if:
 - a. in the exercise of reasonable judgment Engineer determines that:
 - 1) it is at least equal in materials of construction, quality, durability, appearance, strength, and design characteristics;
 - 2) it will reliably perform at least equally well the function and achieve the results imposed by the design concept of the completed Project as a functioning whole;
 - 3) it has a proven record of performance and availability of responsive service; and
 - 4) it is not objectionable to Owner.
 - b. Contractor certifies that, if approved and incorporated into the Work:
 - 1) there will be no increase in cost to the Owner or increase in Contract Times; and
 - 2) it will conform substantially to the detailed requirements of the item named in the Contract Documents.
- 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 shall result in any change in Contract Price. The Engineer's denial of an "or-equal" request shall be final and binding, and may not be reversed through an appeal under any provision of the Contract Documents.
- E. *Treatment as a Substitution Request:* If Engineer determines that an item of material or equipment proposed by Contractor does not qualify as an "or-equal" item, Contractor may request that Engineer consider the proposed item as a substitute pursuant to Paragraph 7.05.

7.05 Substitutes

- A. Unless the specification or description of an item of material or equipment 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 material or equipment under the circumstances described below. To the extent possible such requests shall 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 material or equipment from anyone other than Contractor.
 - 2. The requirements for review by Engineer will be as set forth in Paragraph 7.05.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 material or equipment that Contractor seeks to furnish or use. The application:
 - a. shall 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 that specified, and
 - 3) be suited to the same use as that 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 that specified, and

- 2) available engineering, sales, maintenance, repair, and replacement services.
- d. shall contain an itemized estimate of all costs or credits that will result directly or indirectly from use of such substitute item, including but not limited to changes in Contract Price, shared savings, costs of redesign, and claims of other contractors affected by any resulting change.
- B. *Engineer's Evaluation and Determination:* Engineer will be allowed a reasonable time to evaluate each substitute request, and to obtain comments and direction from Owner. Engineer may require Contractor to furnish additional data about the proposed substitute item. Engineer will be the sole judge of acceptability. No substitute will be ordered, furnished, installed, or utilized until Engineer's review is complete and Engineer determines that the proposed item is an acceptable substitute. Engineer's determination will be evidenced by a Field Order or a proposed Change Order accounting for the substitution itself and all related impacts, including changes in Contract Price or Contract Times. Engineer will advise Contractor in writing of any negative determination.
- C. *Special Guarantee:* Owner may require Contractor to furnish at Contractor's expense a special performance guarantee or other surety with respect to any substitute.
- D. *Reimbursement of Engineer's Cost:* Engineer will record Engineer's costs in evaluating a substitute proposed or submitted by Contractor. Whether or not Engineer approves a substitute so proposed or submitted by Contractor, Contractor shall reimburse Owner for the reasonable charges of Engineer for evaluating each such proposed substitute. Contractor shall also reimburse Owner for the reasonable charges of Engineer for making changes in the Contract Documents (or in the provisions of any other direct contract with Owner) resulting from the acceptance of each proposed substitute.
- E. *Contractor's Expense:* Contractor shall provide all data in support of any proposed substitute at Contractor's expense.
- F. *Effect of Engineer's Determination:* If Engineer approves the substitution request, Contractor shall execute the proposed Change Order and proceed with the substitution. The Engineer's denial of a substitution request shall be final and binding, and may not be reversed through an appeal under any provision of the Contract Documents. Contractor may challenge the scope of reimbursement costs imposed under Paragraph 7.05.D, by timely submittal of a Change Proposal.

7.06 *Concerning Subcontractors, Suppliers, and Others*

- A. Contractor may retain Subcontractors and Suppliers for the performance of parts of the Work. Such Subcontractors and Suppliers must be acceptable to Owner.
- B. Contractor shall retain specific Subcontractors, Suppliers, or other individuals or entities 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, Supplier, or other individual or entity 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 five days.

- E. Owner may require the replacement of any Subcontractor, Supplier, or other individual or entity retained by Contractor to perform any part of the Work. 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, Suppliers, or other individuals or entities 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, Supplier, or other individual or entity so identified solely on the basis of substantive, reasonable objection after due investigation. Contractor shall submit an acceptable replacement for the rejected Subcontractor, Supplier, or other individual or entity.
- F. If Owner requires the replacement of any Subcontractor, Supplier, or other individual or entity retained by Contractor to perform any part of the Work, then Contractor shall be entitled to an adjustment in Contract Price or Contract Times, or both, 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, Supplier, or other individual or entity, whether initially or as a replacement, shall constitute a waiver of the right of Owner to the completion of the Work in accordance with the Contract Documents.
- H. On a monthly basis Contractor shall submit to Engineer a complete list of all Subcontractors and Suppliers having a direct contract with Contractor, and of all other Subcontractors and Suppliers known to Contractor at the time of submittal.
- I. Contractor shall be fully responsible to Owner and Engineer for all acts and omissions of the Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work just as Contractor is responsible for Contractor's own acts and omissions.
- J. Contractor shall be solely responsible for scheduling and coordinating the work of Subcontractors, Suppliers, and all other individuals or entities performing or furnishing any of the Work.
- K. Contractor shall restrict all Subcontractors, Suppliers, and such other individuals or entities performing or furnishing any of the Work from communicating with Engineer or Owner, except through Contractor or in case of an emergency, or as otherwise expressly allowed herein.
- L. The divisions and sections of the Specifications and the identifications of any Drawings shall not control Contractor in dividing the Work among Subcontractors or Suppliers or delineating the Work to be performed by any specific trade.
- M. All Work performed for Contractor by a Subcontractor or Supplier shall be pursuant to an appropriate contractual agreement that specifically binds the Subcontractor or Supplier to the applicable terms and conditions of the Contract Documents for the benefit of Owner and Engineer.
- N. Owner may furnish to any Subcontractor or Supplier, to the extent practicable, information about amounts paid to Contractor on account of Work performed for Contractor by the particular Subcontractor or Supplier.

O. Nothing in the Contract Documents:

1. shall create for the benefit of any such Subcontractor, Supplier, or other individual or entity any contractual relationship between Owner or Engineer and any such Subcontractor, Supplier, or other individual or entity; nor
2. shall create any obligation on the part of Owner or Engineer to pay or to see to the payment of any money due any such Subcontractor, Supplier, or other individual or entity except as may otherwise be required by Laws and Regulations.

7.07 *Patent Fees and Royalties*

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

7.08 *Permits*

- A. Unless otherwise provided in the Contract Documents, Contractor shall obtain and pay for all construction permits and licenses. Owner shall assist Contractor, when necessary, in obtaining such permits and licenses. Contractor shall pay all governmental charges and inspection fees necessary for the prosecution of the Work which are applicable at the time of 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

7.09 *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.

7.10 *Laws and Regulations*

- A. Contractor shall give all notices required by and shall comply with all Laws and Regulations applicable to the performance of the Work. Except where otherwise expressly required by applicable Laws and Regulations, neither Owner nor Engineer shall be responsible for monitoring Contractor's compliance with any Laws or Regulations.
- B. If Contractor performs any Work 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 shall not be Contractor's responsibility to make certain that the Work described in the Contract Documents is in accordance with Laws and Regulations, but this shall not relieve Contractor of Contractor's obligations under Paragraph 3.03.
- C. Owner or Contractor may give 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 notice Contractor may submit a Change Proposal, or Owner may initiate a Claim.

7.11 *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.

7.12 *Safety and Protection*

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

2. all the Work and materials and equipment to be incorporated therein, whether in storage on or off the Site; and
 3. other property at the Site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, other work in progress, utilities, and Underground Facilities not designated for removal, relocation, or replacement in the course of construction.
- B. Contractor shall comply with all applicable Laws and Regulations relating to the safety of persons or property, or to the protection of persons or property from damage, injury, or loss; and shall erect and maintain all necessary safeguards for such safety and protection. Contractor shall notify Owner; the owners of adjacent property, Underground Facilities, and other utilities; and other contractors and utility owners performing work at or adjacent to the Site, when 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.
 - C. Contractor shall comply with the applicable requirements of Owner's safety programs, if any. The Supplementary Conditions identify any Owner's safety programs that are applicable to the Work.
 - D. Contractor shall inform Owner and Engineer of the specific requirements of Contractor's safety program with which Owner's and Engineer's employees and representatives must comply while at the Site.
 - E. All damage, injury, or loss to any property referred to in Paragraph 7.12.A.2 or 7.12.A.3 caused, directly or indirectly, in whole or in part, by Contractor, any Subcontractor, Supplier, or any other individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, shall be remedied by Contractor 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).
 - F. Contractor's duties and responsibilities for safety and protection shall continue until such time as all the Work is completed and Engineer has issued a notice to Owner and Contractor in accordance with Paragraph 15.06.B that the Work is acceptable (except as otherwise expressly provided in connection with Substantial Completion).
 - G. Contractor's duties and responsibilities for safety and protection shall 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.

7.13 *Safety Representative*

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

7.14 *Hazard Communication Programs*

- A. Contractor shall be responsible for coordinating any exchange of material safety data sheets or other hazard communication information required to be made available to or

exchanged between or among employers at the Site in accordance with Laws or Regulations.

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 threatened damage, injury, or loss. Contractor shall give Engineer prompt written notice if Contractor believes that any significant changes in the Work or variations from the Contract Documents have been caused thereby or are required as a result thereof. If Engineer determines that a change in the Contract Documents is required because of the action taken by Contractor in response to such an emergency, a Work Change Directive or Change Order will be issued.

7.16 *Shop Drawings, Samples, and Other Submittals*

A. *Shop Drawing and Sample Submittal Requirements:*

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

- B. *Submittal Procedures for Shop Drawings and Samples:* Contractor shall submit Shop Drawings and Samples to Engineer for review and approval in accordance with the accepted Schedule of Submittals. Each submittal will be identified as Engineer may require.

1. *Shop Drawings:*

- a. Contractor shall submit the number of copies required in the Specifications.
- b. Data shown on the Shop Drawings will be complete with respect to quantities, dimensions, specified performance and design criteria, materials, and similar data to show Engineer the services, materials, and equipment Contractor proposes to

provide and to enable Engineer to review the information for the limited purposes required by Paragraph 7.16.D.

2. *Samples:*

- a. Contractor shall submit the number of Samples required in the Specifications.
- b. Contractor shall clearly identify each Sample as to material, Supplier, pertinent data such as catalog numbers, the use for which intended and other data as Engineer may require to enable Engineer to review the submittal for the limited purposes required by Paragraph 7.16.D.

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. *Other Submittals:* Contractor shall submit other submittals to Engineer in accordance with the accepted Schedule of Submittals, and pursuant to the applicable terms of the Specifications.

D. *Engineer's Review:*

1. Engineer will provide timely review of Shop Drawings and Samples in accordance with the Schedule of Submittals acceptable to Engineer. Engineer's review and approval will be only to determine if the items covered by the submittals will, after installation or incorporation in the Work, conform to the information given in the Contract Documents and be compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents.
2. Engineer's review and approval will not extend to means, methods, techniques, sequences, or procedures of construction 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 shall not relieve Contractor from responsibility for any variation from the requirements of the Contract Documents unless Contractor has complied with the requirements of Paragraph 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.
5. Engineer's review and approval of a Shop Drawing or Sample shall not relieve Contractor from responsibility for complying with the requirements of Paragraph 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, shall 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, Sample, or other submittal shall 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.D.4.

E. *Resubmittal Procedures:*

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

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

- D. 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 shall 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 and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to the performance of the Work, provided that any such claim, cost, loss, or damage is attributable to bodily injury, sickness, disease, or death, or to injury to or destruction of tangible property (other than the Work itself), including the loss of use resulting therefrom but only to the extent caused by any negligent act or omission of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work or anyone for whose acts any of them may be liable.
- B. In any and all claims against Owner or Engineer or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors by any employee (or the survivor or personal representative of such employee) of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, the indemnification obligation under Paragraph 7.18.A shall not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for Contractor or any such Subcontractor, Supplier, or other individual or entity under workers' compensation acts, disability benefit acts, or other employee benefit acts.
- C. The indemnification obligations of Contractor under Paragraph 7.18.A shall not extend to the liability of Engineer and Engineer's officers, directors, members, partners, employees, agents, consultants and subcontractors arising out of:
 - 1. the preparation or approval of, or the failure to prepare or approve maps, Drawings, opinions, reports, surveys, Change Orders, designs, or Specifications; or
 - 2. giving directions or instructions, or failing to give them, if that is the primary cause of the injury or damage.

7.19 *Delegation of Professional Design Services*

- A. Contractor will not be required to provide professional design services unless such services are specifically required by the Contract Documents for a portion of the Work or unless such services are required to carry out Contractor's responsibilities for construction means, methods, techniques, sequences and procedures. Contractor shall not be required to provide professional services in violation of applicable Laws and Regulations.
- B. If professional design services or certifications by a design professional related to systems, materials, or equipment are specifically required of Contractor by the Contract Documents, Owner and Engineer will specify all performance and design criteria that such services must satisfy. Contractor shall cause such services or certifications to be provided by a properly licensed professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, and other submittals prepared by such professional. Shop

Drawings and other submittals related to the Work designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to Engineer.

- C. Owner and Engineer shall be entitled to rely upon the adequacy, accuracy, and completeness of the services, certifications, or approvals performed by such design professionals, provided Owner and Engineer have specified to Contractor all performance and design criteria that such services must satisfy.
- D. Pursuant to this paragraph, Engineer's review and approval of design calculations and design drawings will be only for the limited purpose of checking for conformance with performance and design criteria given and the design concept expressed in the Contract Documents. Engineer's review and approval of Shop Drawings and other submittals (except design calculations and design drawings) will be only for the purpose stated in Paragraph 7.16.D.1.
- E. Contractor shall not be responsible for the adequacy of the performance or design criteria specified by Owner or Engineer.

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 utility work at or adjacent to the Site, Owner shall provide such information to Contractor.
- C. Contractor shall afford each other contractor that performs such other work, each utility owner performing other work, and Owner, if Owner is performing other work with Owner's employees, proper and safe access to the Site, and provide a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such other work. 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.
- D. If the proper execution or results of any part of Contractor's Work depends upon work performed by others under this Article 8, 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.

8.02 *Coordination*

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

8.03 *Legal Relationships*

- A. If, in the course of performing other work at or adjacent to the Site for Owner, the Owner's employees, any other contractor working for Owner, or any utility owner 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, or both. 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 shall 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. When applicable, any such equitable adjustment in Contract Price shall 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 is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times.
- 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. 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 to 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.
- C. 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 to Contractor.

- D. 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 shall be that of the former Engineer.

9.03 *Furnish Data*

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

9.04 *Pay When Due*

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

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

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

9.06 *Insurance*

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

9.07 *Change Orders*

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

9.08 *Inspections, Tests, and Approvals*

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

9.09 *Limitations on Owner's Responsibilities*

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

9.10 *Undisclosed Hazardous Environmental Condition*

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

9.11 *Evidence of Financial Arrangements*

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

9.12 *Safety Programs*

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

ARTICLE 10 – ENGINEER'S STATUS DURING CONSTRUCTION

10.01 *Owner's Representative*

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

10.02 *Visits to Site*

- A. Engineer will make visits to the Site at intervals appropriate to the various stages of construction as Engineer deems necessary in order to observe as an experienced and qualified design professional the progress that has been made and the quality of the various aspects of Contractor's executed Work. Based on information obtained during such visits and observations, Engineer, for the benefit of Owner, will determine, in general, if the Work is proceeding in accordance with the Contract Documents. Engineer will not be required to make exhaustive or continuous inspections on the Site to check the quality or quantity of the Work. Engineer's efforts will be directed toward providing for Owner a greater degree of confidence that the completed Work will conform generally to the Contract Documents. On the basis of such visits and observations, Engineer will keep Owner informed of the progress of the Work and will endeavor to guard Owner against defective Work.
- B. Engineer's visits and observations are subject to all the limitations on Engineer's authority and responsibility set forth in Paragraph 10.08. 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 *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 Paragraph 10.08. If Owner designates another representative or agent to represent Owner at the Site who is not Engineer's consultant, agent, or employee, the responsibilities and authority and limitations thereon of such other individual or entity will be as provided in the Supplementary Conditions.

10.04 *Rejecting Defective Work*

- A. Engineer has the authority to reject Work in accordance with Article 14.

10.05 *Shop Drawings, Change Orders and Payments*

- A. Engineer's authority, and limitations thereof, as to Shop Drawings and Samples, are set forth in Paragraph 7.16.
- B. Engineer's authority, and limitations thereof, as to design calculations and design drawings submitted in response to a delegation of professional design services, if any, are set forth in Paragraph 7.19.
- C. Engineer's authority as to Change Orders is set forth in Article 11.
- D. Engineer's authority as to Applications for Payment is set forth in Article 15.

10.06 *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.

10.07 *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.

10.08 *Limitations on Engineer's Authority and Responsibilities*

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

- B. Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Engineer will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.
- C. Engineer will not be responsible for the acts or omissions of Contractor or of any Subcontractor, any Supplier, or of any other individual or entity performing any of the Work.
- D. Engineer's review of the final Application for Payment and accompanying documentation and all maintenance and operating instructions, schedules, guarantees, bonds, certificates of inspection, tests and approvals, and other documentation required to be delivered by Paragraph 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 10.08 shall also apply to the Resident Project Representative, if any.

10.09 *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 (if any) of which Engineer has been informed.

ARTICLE 11 – AMENDING THE CONTRACT DOCUMENTS; CHANGES IN THE WORK

11.01 *Amending and Supplementing Contract Documents*

- A. The Contract Documents may be amended or supplemented by a Change Order, a Work Change Directive, or a Field Order.
 - 1. *Change Orders:*
 - a. If an amendment or supplement to the Contract Documents includes a change in the Contract Price or the Contract Times, such amendment or supplement must be set forth in a Change Order. A Change Order also may be used to establish amendments and supplements of the Contract Documents that do not affect the Contract Price or Contract Times.
 - b. Owner and Contractor may amend those terms and conditions of the Contract Documents that do not 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, without the recommendation of the Engineer. Such an amendment shall be set forth in a Change Order.
 - 2. *Work Change Directives:* 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 11.04 regarding change of Contract Price. Contractor must submit any Change Proposal seeking an

adjustment of the Contract Price or the Contract Times, or both, no later than 30 days after the completion of the Work set out in the Work Change Directive. Owner must submit any Claim seeking an adjustment of the Contract Price or the Contract Times, or both, no later than 60 days after issuance of the Work Change Directive.

3. *Field Orders*: 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. If Contractor believes that a Field Order justifies an adjustment in the Contract Price or Contract Times, or both, then before proceeding with the Work at issue, Contractor shall submit a Change Proposal as provided herein.

11.02 *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. Such changes shall be supported by Engineer's recommendation, to the extent the change involves the design (as set forth in the Drawings, Specifications, or otherwise), or other engineering or technical matters. Such changes 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 shall be performed under the applicable conditions of the Contract Documents. Nothing in this paragraph shall obligate 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.

11.03 *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.

11.04 *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 shall comply with the provisions of Paragraph 11.06. Any Claim for an adjustment of Contract Price shall 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); or
 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 11.04.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 11.04.C).

- C. *Contractor's Fee*: When applicable, the Contractor's fee for overhead and profit shall be determined as follows:
1. a mutually acceptable fixed fee; or
 2. if a fixed fee is not agreed upon, then a fee based on the following percentages of the various portions of the Cost of the Work:
 - a. for costs incurred under Paragraphs 13.01.B.1 and 13.01.B.2, the Contractor's fee shall be 15 percent;
 - b. for costs incurred under Paragraph 13.01.B.3, the Contractor's fee shall be five percent;
 - c. where one or more tiers of subcontracts are on the basis of Cost of the Work plus a fee and no fixed fee is agreed upon, the intent of Paragraphs 11.01.C.2.a and 11.01.C.2.b is that the Contractor's fee shall be based on: (1) a fee of 15 percent of the costs incurred under Paragraphs 13.01.A.1 and 13.01.A.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 five 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 shall be no greater than 27 percent of the costs incurred by the Subcontractor that actually performs the work;
 - d. no fee shall 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 will be the amount of the actual net decrease in cost plus a deduction in Contractor's fee by an amount equal to five percent of such net decrease; and
 - f. when both additions and credits are involved in any one change, the adjustment in Contractor's fee shall be computed on the basis of the net change in accordance with Paragraphs 11.04.C.2.a through 11.04.C.2.e, inclusive.

11.05 *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 shall comply with the provisions of Paragraph 11.06. Any Claim for an adjustment in the Contract Times shall comply with the provisions of Article 12.
- B. An adjustment of the Contract Times shall be subject to the limitations set forth in Paragraph 4.05, concerning delays in Contractor's progress.

11.06 *Change Proposals*

- A. Contractor shall submit a Change Proposal to Engineer to request an adjustment in the Contract Times or Contract Price; appeal an initial decision by Engineer concerning the requirements of the Contract Documents or relating to the acceptability of the Work under the Contract Documents; contest a set-off against payment due; or seek other relief under

the Contract. The Change Proposal shall specify any proposed change in Contract Times or Contract Price, or both, or other proposed relief, and explain the reason for the proposed change, with citations to any governing or applicable provisions of the Contract Documents.

1. *Procedures:* Contractor shall submit each Change Proposal to Engineer promptly (but in no event later than 30 days) after the start of the event giving rise thereto, or after such initial decision. 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. The supporting data shall 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. Engineer will advise Owner regarding the Change Proposal, and consider any comments or response from Owner regarding the Change Proposal.
 2. *Engineer's Action:* Engineer will review each Change Proposal and, within 30 days after receipt of the Contractor's supporting data, either deny the Change Proposal in whole, approve it in whole, or deny it in part and approve it in part. Such actions shall 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.
 3. *Binding Decision:* Engineer's decision will be final and binding upon Owner and Contractor, unless Owner or Contractor appeals the decision by filing a Claim under Article 12.
- B. *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 that the Engineer is unable to resolve the Change Proposal. For purposes of further resolution of such a Change Proposal, such notice shall be deemed a denial, and Contractor may choose to seek resolution under the terms of Article 12.

11.07 *Execution of Change Orders*

- A. Owner and Contractor shall execute appropriate Change Orders covering:
1. changes in the Contract Price or Contract Times which are agreed to by the parties, including any undisputed sum or amount of time for Work actually performed in accordance with a Work Change Directive;
 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 11.02, (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 in the Contract Price or Contract Times, or other changes, which embody the substance of any final and binding results under Paragraph 11.06, or Article 12.

- B. If Owner or Contractor refuses to execute a Change Order that is required to be executed under the terms of this Paragraph 11.07, it shall be deemed to be of full force and effect, as if fully executed.

11.08 *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 shall be submitted 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; and
 - 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.
- 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 shall rest with the party making the Claim. In the case of a Claim by Contractor seeking an increase in the Contract Times or Contract Price, or both, 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 shall be stated in writing and submitted to the other party, with a copy to Engineer.
- D. *Mediation:*
 - 1. At any time after initiation of a Claim, Owner and Contractor may mutually agree to mediation of the underlying dispute. The agreement to mediate shall 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 shall 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 shall 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 shall 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 shall 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 shall be incorporated in a Change Order 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. To determine the value of a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price. When the value of any such adjustment is determined on the basis of Cost of the Work, Contractor is entitled only to those additional or incremental costs required because of the change in the Work or because of the event giving rise to the adjustment.
- B. *Costs Included*: Except as otherwise may be agreed to in writing by Owner, costs included in the Cost of the Work shall be in amounts no higher than those prevailing in the locality of the Project, shall not include any of the costs itemized in Paragraph 13.01.C, and shall include only the following items:
 1. Payroll costs for employees in the direct employ of Contractor in the performance of the Work under schedules of job classifications agreed upon by Owner and Contractor. Such employees shall include, without limitation, superintendents, foremen, and other personnel employed full time on the Work. Payroll costs for employees not employed full time on the Work shall be apportioned on the basis of their time spent on the Work. Payroll costs shall include, but not be limited to, salaries and wages plus the cost of fringe benefits, which shall include social security contributions, unemployment, excise, and payroll taxes, workers' compensation, health and retirement benefits, bonuses, sick leave, and vacation and holiday pay applicable

thereto. The expenses of performing Work outside of regular working hours, on Saturday, Sunday, or legal holidays, shall be included in the above to the extent authorized by Owner.

2. Cost of all materials and equipment furnished and incorporated in the Work, including costs of transportation and storage thereof, and Suppliers' field services required in connection therewith. All cash discounts shall accrue to Contractor unless Owner deposits funds with Contractor with which to make payments, in which case the cash discounts shall accrue to Owner. All trade discounts, rebates, and refunds and returns from sale of surplus materials and equipment shall accrue to Owner, and Contractor shall make provisions so that they may be obtained.
3. Payments made by Contractor to Subcontractors for Work performed by Subcontractors. If required by Owner, Contractor shall obtain competitive bids from subcontractors acceptable to Owner and Contractor and shall deliver such bids to Owner, who will then determine, with the advice of Engineer, which bids, if any, will be acceptable. If any subcontract provides that the Subcontractor is to be paid on the basis of Cost of the Work plus a fee, the Subcontractor's Cost of the Work and fee shall be determined in the same manner as Contractor's Cost of the Work and fee as provided in this Paragraph 13.01.
4. Costs of special consultants (including but not limited to engineers, architects, testing laboratories, surveyors, attorneys, and accountants) employed for services specifically related to the Work.
5. Supplemental costs including the following:
 - a. The proportion of necessary transportation, travel, and subsistence expenses of Contractor's employees incurred in discharge of duties connected with the Work.
 - b. Cost, including transportation and maintenance, of all materials, supplies, equipment, machinery, appliances, office, and temporary facilities at the Site, and hand tools not owned by the workers, which are consumed in the performance of the Work, and cost, less market value, of such items used but not consumed which remain the property of Contractor.
 - c. Rentals of all construction equipment and machinery, and the parts thereof, whether rented from Contractor or others in accordance with rental agreements approved by Owner with the advice of Engineer, and the costs of transportation, loading, unloading, assembly, dismantling, and removal thereof. All such costs shall be in accordance with the terms of said rental agreements. The rental of any such equipment, machinery, or parts shall cease when the use thereof is no longer necessary for the Work.
 - d. Sales, consumer, use, and other similar taxes related to the Work, and for which Contractor is liable, as imposed by Laws and Regulations.
 - e. Deposits lost for causes other than negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, and royalty payments and fees for permits and licenses.
 - f. Losses and damages (and related expenses) caused by damage to the Work, not compensated by insurance or otherwise, sustained by Contractor in connection with the performance of the Work (except losses and damages within the deductible amounts of property insurance established in accordance with Paragraph 6.05), provided such losses and damages have resulted from causes

other than the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable. Such losses shall include settlements made with the written consent and approval of Owner. No such losses, damages, and expenses shall be included in the Cost of the Work for the purpose of determining Contractor's fee.

- g. The cost of utilities, fuel, and sanitary facilities at the Site.
- h. Minor expenses such as communication service at the Site, express and courier services, and similar petty cash items in connection with the Work.
- i. The costs of premiums for all bonds and insurance that Contractor is required by the Contract Documents to purchase and maintain.

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

- 1. Payroll costs and other compensation of Contractor's officers, executives, principals (of partnerships and sole proprietorships), general managers, safety managers, engineers, architects, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expeditors, timekeepers, clerks, and other personnel employed by Contractor, whether at the Site or in Contractor's principal or branch office for general administration of the Work and not specifically included in the agreed upon schedule of job classifications referred to in Paragraph 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. Expenses of Contractor's principal and branch offices other than Contractor's office at the Site.
- 3. Any part of Contractor's capital expenses, including interest on Contractor's capital employed for the Work and charges against Contractor for delinquent payments.
- 4. Costs due to the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not limited to, the correction of defective Work, disposal of materials or equipment wrongly supplied, and making good any damage to property.
- 5. Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in Paragraph 13.01.B.

D. *Contractor's Fee:* When the Work as a whole is performed on the basis of cost-plus, Contractor's fee shall be determined as set forth in the Agreement. When the value of any Work covered by a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price is determined on the basis of Cost of the Work, Contractor's fee shall be determined as set forth in Paragraph 11.04.C.

E. *Documentation:* Whenever the Cost of the Work for any purpose is to be determined pursuant to this Article 13, Contractor will establish and maintain records thereof in accordance with generally accepted accounting practices and submit in a form acceptable to Engineer an itemized cost breakdown together with supporting data.

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 on account of any of the foregoing will be valid.
- C. *Contingency Allowance*: Contractor agrees that a contingency allowance, if any, is for the sole use of Owner to cover unanticipated costs.
- D. Prior to final payment, an appropriate Change Order will be issued as recommended by Engineer to reflect actual amounts due Contractor on account of Work covered by allowances, and the Contract Price shall be correspondingly adjusted.

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, subject to the provisions of the following paragraph.
- E. Within 30 days of Engineer's written decision under the preceding paragraph, Contractor may submit a Change Proposal, or Owner may file a Claim, seeking an adjustment in the Contract Price if:
 - 1. the quantity of any item of Unit Price Work performed by Contractor differs materially and significantly from the estimated quantity of such item indicated in the Agreement;
 - 2. there is no corresponding adjustment with respect to any other item of Work; and
 - 3. Contractor believes that it is entitled to an increase in Contract Price as a result of having incurred additional expense or Owner believes that Owner is entitled to a decrease in Contract Price, and the parties are unable to agree as to the amount of any such increase or decrease.

ARTICLE 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 will have access to the Site and the Work at reasonable times for their observation, inspection, and testing. Contractor shall provide them proper and safe conditions for such access and advise them of Contractor's safety procedures and programs so that they may comply therewith as applicable.

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 shall be governed by the provisions of Paragraph 14.05.
- C. If Laws or Regulations of any public body having jurisdiction require any Work (or part thereof) specifically to be inspected, tested, or approved by an employee or other representative of such public body, Contractor shall assume full responsibility for arranging and obtaining such inspections, tests, or approvals, pay all costs in connection therewith, and furnish Engineer the required certificates of inspection or approval.
- D. Contractor shall be responsible for arranging, obtaining, and paying for all inspections and tests required:
 - 1. by the Contract Documents, unless the Contract Documents expressly allocate responsibility for a specific inspection or test to Owner;
 - 2. to attain Owner's and Engineer's acceptance of materials or equipment to be incorporated in the Work;
 - 3. by manufacturers of equipment furnished under the Contract Documents;
 - 4. for testing, adjusting, and balancing of mechanical, electrical, and other equipment to be incorporated into the Work; and
 - 5. for acceptance of materials, mix designs, or equipment submitted for approval prior to Contractor's purchase thereof for incorporation in the Work.

Such inspections and tests shall 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 shall 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 notice of all defective Work of which Owner or Engineer has actual knowledge will be given to Contractor.
- D. *Correction, or Removal and Replacement:* Promptly after receipt of written notice of defective Work, Contractor shall correct all such defective Work, whether or not fabricated, installed, or completed, or, if Engineer has rejected the defective Work, remove it from the Project and replace it with Work that is not defective.
- E. *Preservation of Warranties:* When correcting defective Work, Contractor shall take no action that would void or otherwise impair Owner's special warranty and guarantee, if any, on said Work.
- F. *Costs and Damages:* In addition to its correction, removal, and replacement obligations with respect to defective Work, Contractor shall pay all claims, costs, losses, and damages arising out of or relating to defective Work, including but not limited to the cost of the inspection, testing, correction, removal, replacement, or reconstruction of such defective Work, fines levied against Owner by governmental authorities because the Work is defective, and the costs of repair or replacement of work of others resulting from defective Work. Prior to final payment, if Owner and Contractor are unable to agree as to the measure of such claims, costs, losses, and damages resulting from defective Work, then Owner may impose a reasonable set-off against payments due under Article 15.

14.04 *Acceptance of Defective Work*

- A. If, instead of requiring correction or removal and replacement of defective Work, Owner prefers to accept it, Owner may do so (subject, if such acceptance occurs prior to final payment, to Engineer's confirmation that such acceptance is in general accord with the design intent and applicable engineering principles, and will not endanger public safety). Contractor shall pay all claims, costs, losses, and damages attributable to Owner's evaluation of and determination to accept such defective Work (such costs to be approved by Engineer as to reasonableness), and for the diminished value of the Work to the extent not otherwise paid by Contractor. If any such acceptance occurs prior to final payment, the necessary revisions in the Contract Documents with respect to the Work shall 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 special 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, or both, directly attributable to such uncovering, exposure, observation, inspection, testing, replacement, and reconstruction. If the parties are unable to agree as to the amount or extent thereof, 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 shall not give rise to any duty on the part of Owner to exercise this right for the benefit of Contractor, any Subcontractor, any Supplier, any other individual or entity, or any surety for, or employee or agent of any of them.

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 rejected Work as required by Engineer, or if Contractor fails to perform the Work in accordance with the Contract Documents, or if Contractor fails to comply with any other provision of the Contract Documents, then Owner may, after seven 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 on account of 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. If payment is requested on the basis of materials and equipment not incorporated in the Work but delivered and suitably stored at the Site or at another location agreed to in writing, the Application for Payment shall also be accompanied by a bill of sale, invoice, or other documentation warranting that Owner has received the materials and equipment free and clear of all Liens, and evidence that the materials and equipment are covered by appropriate property insurance, a warehouse bond, or other arrangements to protect Owner's interest therein, all of which must be satisfactory to Owner.
 2. Beginning with the second Application for Payment, each Application shall include an affidavit of Contractor stating that all previous progress payments received on account of the Work have been applied on account to discharge Contractor's legitimate obligations associated with prior Applications for Payment.
 3. The amount of retainage with respect to progress payments will be as stipulated in the Agreement.
- C. *Review of Applications:*
1. Engineer will, within 10 days after receipt of each Application for Payment, including each resubmittal, either indicate in writing a recommendation of payment and present the Application to Owner, or return the Application to Contractor indicating in writing Engineer's reasons for refusing to recommend payment. In the latter case, Contractor may make the necessary corrections and resubmit the Application.
 2. Engineer's recommendation of any payment requested in an Application for Payment will constitute a representation by Engineer to Owner, based on Engineer's observations of the executed Work as an experienced and qualified design professional, and on Engineer's review of the Application for Payment and the accompanying data and schedules, that to the best of Engineer's knowledge, information and belief:

- a. the Work has progressed to the point indicated;
 - b. the quality of the Work is generally in accordance with the Contract Documents (subject to an evaluation of the Work as a functioning whole prior to or upon Substantial Completion, the results of any subsequent tests called for in the Contract Documents, a final determination of quantities and classifications for Unit Price Work under Paragraph 13.03, and any other qualifications stated in the recommendation); and
 - c. the conditions precedent to Contractor's being entitled to such payment appear to have been fulfilled in so far as it is Engineer's responsibility to observe the Work.
3. By recommending any such payment Engineer will not thereby be deemed to have represented that:
- a. inspections made to check the quality or the quantity of the Work as it has been performed have been exhaustive, extended to every aspect of the Work in progress, or involved detailed inspections of the Work beyond the responsibilities specifically assigned to Engineer in the Contract; or
 - b. there may not be other matters or issues between the parties that might entitle Contractor to be paid additionally by Owner or entitle Owner to withhold payment to Contractor.
4. Neither Engineer's review of Contractor's Work for the purposes of recommending payments nor Engineer's recommendation of any payment, including final payment, will impose responsibility on Engineer:
- a. to supervise, direct, or control the Work, or
 - b. for the means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or
 - c. for Contractor's failure to comply with Laws and Regulations applicable to Contractor's performance of the Work, or
 - d. to make any examination to ascertain how or for what purposes Contractor has used the money paid on account of the Contract Price, or
 - e. to determine that title to any of the Work, materials, or equipment has passed to Owner free and clear of any Liens.
5. Engineer may refuse to recommend the whole or any part of any payment if, in Engineer's opinion, it would be incorrect to make the representations to Owner stated in Paragraph 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 on account of Contractor's conduct in the performance or furnishing of the Work, or Owner has incurred costs, losses, or damages on account of Contractor's conduct in the performance or furnishing of the Work, including but not limited to claims, costs, losses, or damages from workplace injuries, adjacent property damage, non-compliance with Laws and Regulations, and patent infringement;
 - b. Contractor has failed to take reasonable and customary measures to avoid damage, delay, disruption, and interference with other work at or adjacent to the Site;
 - c. Contractor has failed to provide and maintain required bonds or insurance;
 - d. Owner has been required to remove or remediate a Hazardous Environmental Condition for which Contractor is responsible;
 - e. Owner has incurred extra charges or engineering costs related to submittal reviews, evaluations of proposed substitutes, tests and inspections, or return visits to manufacturing or assembly facilities;
 - f. the Work is defective, requiring correction or replacement;
 - g. Owner has been required to correct defective Work in accordance with Paragraph 14.07, or has accepted defective Work pursuant to Paragraph 14.04;
 - h. the Contract Price has been reduced by Change Orders;
 - i. an event that would constitute a default by Contractor and therefore justify a termination for cause has occurred;
 - j. liquidated 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;
 - l. there are other items entitling 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 shall 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 shall be treated as an amount due as determined by Paragraph 15.01.C.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 seven days after the time of payment by Owner.

15.03 *Substantial Completion*

- A. When Contractor considers the entire Work ready for its intended use Contractor shall notify Owner and Engineer in writing that the entire Work is substantially complete and request that Engineer issue a certificate of Substantial Completion. Contractor shall at the same time submit to Owner and Engineer an initial draft of punch list items to be completed or corrected before final payment.
- B. Promptly after Contractor's notification, Owner, Contractor, and Engineer shall make an inspection of the Work to determine the status of completion. If Engineer does not consider the Work substantially complete, Engineer will notify Contractor in writing giving the reasons therefor.
- C. If Engineer considers the Work substantially complete, Engineer will deliver to Owner a preliminary certificate of Substantial Completion which shall 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 seven 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 E for that part of the Work.
 - 2. At any time Contractor may notify Owner and Engineer in writing that Contractor considers any such part of the Work substantially complete and request Engineer to issue a certificate of Substantial Completion for that part of the Work.
 - 3. Within a reasonable time after either such request, Owner, Contractor, and Engineer shall make an inspection of that part of the Work to determine its status of completion. If Engineer does not consider that part of the Work to be substantially complete, Engineer will notify Owner and Contractor in writing giving the reasons therefor. If Engineer considers that part of the Work to be substantially complete, the provisions of Paragraph 15.03 will apply with respect to certification of Substantial Completion of that part of the Work and the division of responsibility in respect thereof and access thereto.
 - 4. No use or occupancy or separate operation of part of the Work may occur prior to compliance with the requirements of Paragraph 6.05 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 7.11), and other documents, Contractor may make application for final payment.

2. The final Application for Payment shall 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 disputes that Contractor believes are unsettled; and
 - e. complete and legally effective releases or waivers (satisfactory to Owner) of all Lien rights arising out of the Work, and of Liens filed in connection with the Work.
3. In lieu of the releases or waivers of Liens specified in Paragraph 15.06.A.2 and as approved by Owner, Contractor may furnish receipts or releases in full and an affidavit of Contractor that: (a) the releases and receipts include all labor, services, material, and equipment for which a Lien could be filed; and (b) all payrolls, material and equipment bills, and other indebtedness connected with the Work for which Owner might in any way be responsible, or which might in any way result in liens or other burdens on Owner's property, have been paid or otherwise satisfied. If any Subcontractor or Supplier fails to furnish such a release or receipt in full, Contractor may furnish a bond or other collateral satisfactory to Owner to indemnify Owner against any Lien, or Owner at its option may issue joint checks payable to Contractor and specified Subcontractors and Suppliers.

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

1. If, on the basis of Engineer's observation of the Work during construction and final inspection, and Engineer's review of the final Application for Payment and accompanying documentation as required by the Contract Documents, Engineer is satisfied that the Work has been completed and Contractor's other obligations under the Contract have been fulfilled, Engineer will, within ten days after receipt of the final Application for Payment, indicate in writing Engineer's recommendation of final payment and present the Application for Payment to Owner for payment. Such recommendation shall 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. At the same time Engineer will also give written notice to Owner and Contractor that the Work is acceptable, subject to the provisions of Paragraph 15.07. 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. *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.
- D. *Payment Becomes Due:* Thirty days after the presentation to Owner of the final Application for Payment and accompanying documentation, the amount recommended by Engineer (less any further sum Owner is entitled to set off against Engineer's recommendation,

including but not limited to set-offs for liquidated damages and set-offs allowed under the provisions above with respect to progress payments) will become due and shall be paid by Owner to Contractor.

15.07 *Waiver of Claims*

- A. The making of final payment will not constitute a waiver by Owner of claims or rights against Contractor. Owner expressly reserves claims and rights arising from unsettled Liens, from defective Work appearing after final inspection pursuant to Paragraph 15.05, from Contractor's failure to comply with the Contract Documents or the terms of any special guarantees specified therein, from outstanding Claims by Owner, or from Contractor's continuing obligations under the Contract Documents.
- 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 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 terms of any applicable special guarantee required by the Contract Documents, or by any specific provision of the Contract Documents), any Work is found to be defective, or if the repair of any damages to the Site, adjacent areas that Contractor has arranged to use through construction easements or otherwise, and other adjacent areas used by Contractor as permitted by Laws and Regulations, is found to be defective, then 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 other adjacent areas;
 - 2. correct such defective Work;
 - 3. if the defective Work has been rejected by Owner, remove it from the Project and replace it with Work that is not defective, and
 - 4. satisfactorily correct or repair or remove and replace any damage to other Work, to the work of others, or to other land or areas resulting therefrom.
- B. If Contractor does not promptly comply with the terms of Owner's written instructions, or in an emergency where delay would cause serious risk of loss or damage, Owner may have the defective Work corrected or repaired or may have the rejected Work removed and replaced. Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or repair or such removal and replacement (including but not limited to all costs of repair or replacement of work of others).
- C. In special circumstances where a particular item of equipment is placed in continuous service before Substantial Completion of all the Work, the correction period for that item may start to run from an earlier date if so provided in the Specifications.
- D. Where defective Work (and damage to other Work resulting therefrom) has been corrected or removed and replaced under this paragraph, the correction period hereunder with respect to such Work will be extended for an additional period of one year after such correction or removal and replacement has been satisfactorily completed.

- E. Contractor's obligations under this paragraph are in addition to all other obligations and warranties. The provisions of this paragraph shall not 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, or both, directly attributable to any such suspension. Any Change Proposal seeking such adjustments shall 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) ten 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) 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 seven days of receipt of notice of intent to terminate begins to correct its failure to perform and proceeds diligently to cure such failure.
- E. If Owner proceeds as provided in Paragraph 16.02.B, Contractor shall not be entitled to receive any further payment until the Work is completed. If the unpaid balance of the Contract Price exceeds the cost to complete the Work, including all related claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals) sustained by Owner, such excess will be paid to Contractor. If the cost to complete the Work including such related claims, costs, losses,

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

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

16.03 *Owner May Terminate For Convenience*

- A. Upon seven days written notice to Contractor and Engineer, Owner may, without cause and without prejudice to any other right or remedy of Owner, terminate the Contract. In such case, Contractor shall be paid for (without duplication of any items):
 - 1. completed and acceptable Work executed in accordance with the Contract Documents prior to the effective date of termination, including fair and reasonable sums for overhead and profit on such Work;
 - 2. expenses sustained prior to the effective date of termination in performing services and furnishing labor, materials, or equipment as required by the Contract Documents in connection with uncompleted Work, plus fair and reasonable sums for overhead and profit on such expenses; 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 on account of loss of anticipated overhead, profits, or revenue, 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 seven days written notice to Owner and Engineer, and provided Owner or Engineer do not remedy such suspension or failure within that time, terminate the contract and recover from Owner payment on the same terms as provided in Paragraph 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, seven days after written notice to Owner and Engineer, stop the Work until payment is made of all such amounts due Contractor, including interest thereon. The provisions of this paragraph are not intended to preclude Contractor from submitting a Change Proposal for an adjustment in Contract Price or Contract Times or otherwise for

expenses or damage directly attributable to Contractor's stopping the Work as permitted by this paragraph.

ARTICLE 17 – FINAL RESOLUTION OF DISPUTES

17.01 *Methods and Procedures*

- A. *Disputes Subject to Final Resolution:* The following disputed matters are subject to final resolution under the provisions of this Article:
 - 1. A timely appeal of an approval in part and denial in part of a Claim, or of a denial in full; and
 - 2. Disputes between Owner and Contractor concerning the Work or obligations under the Contract Documents, and arising 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; or
 - 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 Documents requires the giving of written notice, it will be deemed to have been validly given if:
 - 1. delivered in person, by a commercial courier service or otherwise, to the individual or to a member of the firm or to an officer of the corporation for which it is intended; or
 - 2. delivered at or sent by registered or certified mail, postage prepaid, to the last business address known to the sender of the notice.

18.02 *Computation of Times*

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

18.03 *Cumulative Remedies*

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

18.04 *Limitation of Damages*

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

18.05 *No Waiver*

- A. A party's non-enforcement of any provision shall not constitute a waiver of that provision, nor shall 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 or completion of the Contract or termination 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 *Headings*

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

Section R

Supplementary Conditions

SUPPLEMENTARY CONDITIONS

ARTICLE 1 – DEFINITIONS AND TERMINOLOGY

SC-1.01 *Defined Terms*

- A. Add to the list of definitions in Paragraph 1.01.A by inserting the following as numbered items in their proper alphabetical positions:

Geotechnical Data Report (GDR) — The factual report that collects and presents data regarding actual subsurface conditions at or adjacent to the Site, including Technical Data and other geotechnical data, prepared by or for Owner in support of the Geotechnical Baseline Report. The GDR's content may include logs of borings, trenches, and other site investigations, recorded measurements of subsurface water levels, the results of field and laboratory testing, and descriptions of the investigative and testing programs. The GDR does not include an interpretation of the data. If opinions, or interpretive or speculative non-factual comments or statements appear in a document that is labeled a GDR, such opinions, comments, or statements are not operative parts of the GDR and do not have contractual standing. Subject to that exception, the GDR is a Contract Document.

Operator Qualifications (OQ) – Each operator of a natural gas system must prepare a written Operator Qualification Plan in accordance with the criteria set forth in Title 49, CFR Part 192, Subpart N. The Greenville Utilities Commission Gas Department (Owner) requires contractors that perform covered tasks on its system that are identified in the Gas Department's Operator Qualification Plan to provide their own Operator Qualification Plan and qualification records of individuals that will perform covered tasks on the Work included under this Contract. The Owner will review the Contractor's OQ plan for compliance with the requirements of §192.805, and review the Contractor's OQ records for compliance with §192.807.

ARTICLE 2 – PRELIMINARY MATTERS

SC-NONE

ARTICLE 3 – DOCUMENTS; INTENT, REQUIREMENTS, REUSE

SC-NONE

ARTICLE 4 – COMMENCEMENT AND PROGRESS OF THE WORK

SC-NONE

ARTICLE 5 – AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS ENVIRONMENTAL CONDITIONS

SC-5.01 *Availability of Lands*

- A. Add as Paragraph 5.01.D by inserting the following:

Owner's rights to install the Northwestern Loop High Pressure Gas Main Extension are provided through Grants of Easement from the property owners and encroachment agreements with jurisdictional authorities. Owner shall furnish the site for the pipeline to the Contractor along with

such conditions and requirements for carrying out the Work on the site. The Contractor shall honor all conditions imposed on the Owner for use of site.

B. Add as Paragraph 5.01.E by inserting the following:

Owner will own both sites intended for the two proposed district regulator stations.

SC-5.03 Subsurface and Physical Conditions

A. Delete Paragraphs 5.03 of the General Conditions in its entirety and replace with the following provisions:

SC/GBR-5.03 Subsurface and Physical Conditions

A. Geotechnical Data Report:

1. This Contract contains a Geotechnical Data Report (GDR), identified as follows: *“Geotechnical Data Report, US 264 HDD Crossings, Greenville, North Carolina, S&ME Project No. 1358-14-033”*, July 28, 2014 prepared by S&ME, Greensboro, North Carolina.
2. The GDR is incorporated as a Contract Document. The GDR is to be used in conjunction with other Contract Documents, including the Drawings and Specifications.
3. The GDR describes certain select subsurface conditions that are anticipated to be encountered by Contractor during construction in specified locations. These may include ground, geological, groundwater, and other subsurface geotechnical conditions.
4. The GDR conditions shall be used to assist in the administration of the Contract’s differing site conditions clause at locations where subsurface conditions were determined in the GDR.
5. The GDR conditions shall not be used to make differing site conditions determinations at locations that have not been evaluated in the GDR.
6. The descriptions of subsurface conditions provided in the GDR are based on geotechnical investigations, laboratory tests, interpretation, interpolation, extrapolation, and analyses. Neither Owner, Engineer, nor any geotechnical or other consultant warrants or guarantees that actual subsurface conditions will be as described in the GDR, nor is the GDR intended to warrant or guarantee the use of specific means or methods of construction.
7. The behavior of the ground during construction depends substantially upon the Contractor’s selected means, methods, techniques, sequences, and procedures of construction.
8. The GBR shall not reduce or relieve Contractor of its responsibility for the planning, selection, and implementation of safety precautions and programs incident to Contractor’s means, methods, techniques, sequences, and procedures of construction, or to the Work.

SC-5.04 Differing Subsurface and Physical Conditions

A. Delete Paragraphs 5.04 of the General Conditions in its entirety and replace with the following provisions:

SC/GBR-5.04 Differing Subsurface or Physical Conditions

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

1. differs materially from conditions shown or indicated in the GDR, to the extent the GDR is inapplicable; or
3. differs materially from conditions shown or indicated in Contract Documents other than the GDR, to the extent the GDR are inapplicable; or
4. to the extent the GDR are inapplicable, 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; or
5. to the extent the GDR is inapplicable, is of such a nature as to require a change in the Drawings or Specifications; or
6. to the extent the GDR is inapplicable, 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 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 the necessity of Owner's obtaining 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 SC/GBR 5.04.A above; obtain any pertinent cost or schedule information from Contractor; prepare recommendations to Owner regarding the Contractor's resumption or continuation 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 or continuation 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. Possible Price and Times Adjustments:

1. Contractor shall be entitled to an equitable adjustment in Contract Price or Contract Times, or both, 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 SC/GBR 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 of the General Conditions; and,
 - c. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times.
- 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; or
 - 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 as required by Paragraph SC/GBR 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, or both, then any such adjustment shall 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, or both, 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.

SC-5.06 Hazardous Environmental Conditions

A. SC 5.06 Delete Paragraphs 5.06.A and 5.06.B in their entirety and insert the following:

- A. No reports or drawings related to Hazardous Environmental Conditions at the Site are known to Owner.
- B. Not Used.

ARTICLE 6 – BONDS AND INSURANCE

SC-6.02 Insurance—General Provisions

A. 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.

SC-6.03 Contractor's Liability Insurance

- A. This is a mandatory Supplementary Condition**, because it is the location for specifying the limits of the coverages for the insurance required in Paragraph 6.03 of the General Conditions.

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

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

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

State:	<u>Statutory</u>
Federal, if applicable (e.g., Longshoreman's):	<u>Statutory</u>
Employer's Liability:	
Bodily injury, each accident	\$ <u>1,000,000</u>
Bodily injury by disease, each employee	\$ <u>1,000,000</u>
Bodily injury/disease aggregate	\$ <u>1,000,000</u>

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

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

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

Bodily Injury:	
Each person	\$ <u>1,000,000</u>
Each accident	\$ <u>1,000,000</u>
Property Damage:	
Each accident	\$ <u>1,000,000</u>
<i>[or]</i>	
Combined Single Limit of	\$ <u>1,000,000</u>

4. Excess or Umbrella Liability:

Per Occurrence	\$ 4,000,000
General Aggregate	\$ 4,000,000

6. Additional Insureds: In addition to Owner and Engineer, include as additional insureds the following: None

SC-6.05 Property Insurance

- A.** Builder's Risk Deductible: *Not applicable.*
- B.** Builder's Risk—Supplemental Insureds: *Not applicable.*
- C.** Builder's Risk—Supplemental Requirements: *Not applicable.*

ARTICLE 7 – CONTRACTOR'S RESPONSIBILITIES

SC-7.02 Labor; Working Hours

Paragraph 7.02.B of the General Conditions restricts Contractor to working during "regular hours" Monday through Friday, and no work is permitted on "legal holidays."

A. SC-7.02.B. Add the following new subparagraphs immediately after Paragraph 7.02.B:

1. Regular working hours for work outside of the NCDOT right-of-way limits of the Highway 264 Bypass will be 8:00 am to 5:00 pm.
2. Regular working hours for work inside of the NCDOT right-of-way limits of the Highway 264 Bypass will be 9:00 am to 3:30 pm.
3. **Owner's holidays are:**
 - a. New Year's Day – January 1 and 2, 2015
 - b. Martin Luther King's Jr. Day – January 19, 2015
 - c. Good Friday – April 3, 2015
 - d. Memorial Day – May 25, 2015
 - e. Independence Day – July 3, 2015
 - f. Labor Day – September 7, 2015
 - g. Veteran's Day – November 11, 2015
 - h. Thanksgiving – November 26 and 27, 2015
 - i. Christmas – December 24 and 25, 2015

B. SC-7.02.B. Amend the first and second sentences of Paragraph 7.02.B to state “...all Work at the Site shall be performed during regular working hours, Monday through Friday. Contractor, with prior approval of Owner, may perform Work on Sunday that requires lane closures within the NCDOT Highway 264 Bypass right-of-way.”

C. SC-7.02.C. Add the following new paragraph immediately after Paragraph 7.02.B:

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

D. SC-7.02.C. Add the following new subparagraph immediately after Paragraph 7.02.C:

1. For purposes of administering the foregoing requirement, additional overtime costs are defined as all time in excess of 40 hours per week or time worked on scheduled holidays or weekends that occur as a result of Contractor’s request and not the Owner’s request.

SC-7.09 Taxes

A. SC 7.09 Add a new paragraph immediately after Paragraph 7.09.A:

- B. Owner is exempt from payment of sales and compensating use taxes of the State of North Carolina and of cities and counties thereof on all materials to be incorporated into the Work.
 1. Owner will furnish the required certificates of tax exemption to Contractor for use in the purchase of supplies and materials to be incorporated into the Work.
 2. Owner’s exemption does not apply to construction tools, machinery, equipment, or other property purchased by or leased by Contractor, or to supplies or materials not incorporated into the Work.

ARTICLE 8 – OTHER WORK AT THE SITE

SC-8.02 Coordination

- A. Paragraph 8.02 of the General Conditions requires that if in addition to retaining Contractor, Owner will arrange to have others perform work at the Site. Owner does not intend to have other’s work on the Construction site unless they are Owner’s crews performing routine maintenance functions.

ARTICLE 9 – OWNER’S RESPONSIBILITIES

SC-9.13 Owner’s Site Representative

- A. No modifications to this Section of the General Conditions.

ARTICLE 10 – ENGINEER’S STATUS DURING CONSTRUCTION

SC-10.03 *Project Representative*

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

- B. The Resident Project Representative (RPR) will be Engineer's representative at the Site, will act as directed by and under the supervision of Engineer, and will confer with Engineer regarding RPR's actions.
 1. General: RPR's dealings in matters pertaining to the Work in general shall be with Engineer and Contractor. RPR's dealings with Subcontractors shall only be through or with the full knowledge and approval of Contractor. RPR shall generally communicate with Owner only with the knowledge of and under the direction of Engineer.
 2. Schedules: Review the progress schedule, schedule of Shop Drawing and Sample submittals, and Schedule of Values prepared by Contractor and consult with Engineer concerning acceptability.
 3. Conferences and Meetings: Attend meetings with Contractor, such as preconstruction conferences, progress meetings, job conferences, and other Project-related meetings, and prepare and circulate copies of minutes thereof.
 4. Liaison:
 - a. Serve as Engineer’s liaison with Contractor. Working principally through Contractor’s authorized representative or designee, assist in providing information regarding the provisions and intent of the Contract Documents.
 - b. Assist Engineer in serving as Owner’s liaison with Contractor when Contractor’s operations affect Owner’s on-Site operations.
 - c. Assist in obtaining from Owner additional details or information, when required for proper execution of the Work.
 5. Interpretation of Contract Documents: Report to Engineer when clarifications and interpretations of the Contract Documents are needed and transmit to Contractor clarifications and interpretations as issued by Engineer.
 6. Shop Drawings and Samples:
 - a. Record date of receipt of Samples and Contractor-approved Shop Drawings.
 - b. Receive Samples which are furnished at the Site by Contractor, and notify Engineer of availability of Samples for examination.
 - c. Advise Engineer and Contractor of the commencement of any portion of the Work requiring a Shop Drawing or Sample submittal for which RPR believes that the submittal has not been approved by Engineer.
 7. Modifications: Consider and evaluate Contractor’s suggestions for modifications in Drawings or Specifications and report such suggestions,

together with RPR's recommendations, if any, to Engineer. Transmit to Contractor in writing decisions as issued by Engineer.

8. Review of Work and Rejection of Defective Work:

- a. Conduct on-Site observations of Contractor's work in progress to assist Engineer in determining if the Work is in general proceeding in accordance with the Contract Documents.
- b. Report to Engineer whenever RPR believes that any part of Contractor's work in progress is defective, will not produce a completed Project that conforms generally to the Contract Documents, or will imperil the integrity of the design concept of the completed Project as a functioning whole as indicated in the Contract Documents, or has been damaged, or does not meet the requirements of any inspection, test or approval required to be made; and advise Engineer of that part of work in progress that RPR believes should be corrected or rejected or should be uncovered for observation, or requires special testing, inspection or approval.

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

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

10. Records:

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

11. Reports:

- a. Furnish to Engineer periodic reports as required of progress of the Work and of Contractor's compliance with the Progress Schedule and schedule of Shop Drawing and Sample submittals.
- b. Draft and recommend to Engineer proposed Change Orders, Work Change Directives, and Field Orders. Obtain backup material from Contractor.

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

7. Accept Shop Drawing or Sample submittals from anyone other than Contractor.
8. Authorize Owner to occupy the Project in whole or in part.

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

SC-13.01 Cost of the Work

- A.** Equipment rental charges, particularly with respect to Contractor-owned equipment, can sometimes lead to disagreements. To reduce the possibility of such disagreements, the following Supplementary Condition may be used. Note that it requires a published reference or method for determining the costs.

SC 13.01.B.5.c Delete Paragraph 13.01.B.5.c in its entirety and insert the following in its place:

- c. Construction Equipment and Machinery:
 - 1) Costs of construction equipment and machinery shall be included by the Contractor in the Unit Prices bid for the Work.

SC-13.03 Unit Price Work

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

- E.** The unit price of an item of Unit Price Work shall be subject to reevaluation and adjustment under the following conditions:
 1. if the extended price of a particular item of Unit Price Work amounts to 5% percent or more over the Contract Price (based on estimated quantities at the time of Contract formation) and the variation in the quantity of that particular item of Unit Price Work actually furnished or performed by Contractor differs by more than 20% percent from the estimated quantity of such item indicated in the Agreement; and
 2. if there is no corresponding adjustment with respect to any other item of Work; and
 3. if Contractor believes that Contractor has incurred additional expense as a result thereof, Contractor may submit a Change Proposal, or if Owner believes that the quantity variation entitles Owner to an adjustment in the unit price, Owner may make a Claim, seeking an adjustment in the Contract Price.

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

SC-15.03 Substantial Completion

- A.** Paragraph 15.03.A of the General Conditions requires Contractor to give notice that the Work is substantially complete; Paragraph 15.03.B requires an inspection of the Work to determine whether Engineer agrees that the Work is substantially complete. If the Work is not substantially complete, and must be inspected again at a later point, then the following Supplementary Condition, if included in the Contract, would allow Owner to recover the cost of the re-inspection.

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

1. If some or all of the Work has been determined not to be at a point of Substantial Completion and will require re-inspection or re-testing by Engineer, the cost of such re-inspection or re-testing, including the cost of time, travel and living expenses, shall 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 Article 15.

ARTICLE 17 – FINAL RESOLUTION OF DISPUTES

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

SC-17.02 Mediation/Binding Arbitration

- A. *Mediation/Binding Arbitration:* In the event of a dispute between the Parties which the Parties are unable to resolve, the Parties shall submit their dispute to non-binding mediation before a mutually agreeable mediator prior to initiating litigation. If the Parties are unable to agree upon a mediator within thirty (30) days after failing to resolve the dispute, either Party may petition a Court of competent jurisdiction for the designation of a qualified mediator for these purposes. Each Party shall bear its own costs and expenses of participating in the mediation (including, without limitation, reasonable attorneys' fees), and each Party shall bear one-half (½) of the costs and expenses of the mediator. Unless otherwise agreed, the Parties will hold mediation in Greenville, North Carolina. The matters discussed or revealed in the mediation session shall not be revealed in any subsequent litigation.
- B. In the event the matter is not resolved in mediation, either Party may request arbitration. The Parties shall jointly select an Arbitrator, and shall be bound by the decision of the Arbitrator with respect to any dispute between the parties with respect to this Agreement. If the parties are unable to mutually agree upon an Arbitrator, the Parties shall each select an Arbitrator, and the two Arbitrators so selected shall select a third Arbitrator, and the decision of the majority of the Arbitrators shall be conclusive and binding upon the Parties. The Parties at all times agree to equally split the costs of any Arbitrator(s) selected in an effort to resolve the dispute between the Parties. Any party desiring to resolve a dispute under the terms of this Agreement shall notify the other Party in writing, and the Parties shall seek to agree upon a mutually agreed-upon Arbitrator within a period of ten (10) days from the date of such written demand. If the Parties are unable to agree within such ten (10) day period, the Parties shall each select an Arbitrator, and the two (2) Arbitrators so selected shall select a third Arbitrator within fifteen (15) days from the date of the written demand for arbitration, and a decision shall be rendered by the Arbitrator(s) so selected within five (5) days after such Arbitrator(s) is selected.
- C. Arbitration shall be conducted in accordance with the American Arbitration Association construction industry rules.

SC-17.03 Attorneys' Fees

- A. No modifications to this Section of the General Conditions

Section S

Work Change Directives

Work Change Directive No.

Date of Issuance:

Effective Date:

Owner: Greenville Utilities Commission

Owner's Contract No.:

Contractor:

Contractor's Project No.:

Engineer: Rummel, Klepper & Kahl, LLP

Engineer's Project No.: 1214-011

Project: GCP89 - Northwestern Loop High
Pressure Gas Main Extension

Contract Name:

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

Description:

Attachments: *[List documents supporting change]*

Purpose for Work Change Directive:

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

☐ Non-agreement on pricing of proposed change.

☐ Necessity to proceed for schedule or other Project reasons.

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

Contract Price \$ [increase] [decrease].

Contract Time days [increase] [decrease].

Basis of estimated change in Contract Price:

☐ Lump Sum

☐ Unit Price

☐ Cost of the Work

☐ Other

RECOMMENDED:

AUTHORIZED BY:

RECEIVED:

By:

Engineer (Authorized Signature)

By:

Owner (Authorized Signature)

By:

Contractor (Authorized Signature)

Title:

Title:

Title:

Date:

Date:

Date:

Approved by Funding Agency (if applicable)

By:

Date:

Title:

Section T

Change Orders

Change Order No. _____

Date of Issuance:	Effective Date:
Owner: Greenville Utilities Commission	Owner's Contract No.:
Contractor:	Contractor's Project No.:
Engineer: Rummel, Klepper & Kahl, LLP	Engineer's Project No.: 1214-011
Project: GCP89 – Northwestern Loop High Pressure Gas Main Extension	Contract Name:

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

Description:

Attachments: *[List documents supporting change]*

CHANGE IN CONTRACT PRICE	CHANGE IN CONTRACT TIMES <i>[note changes in Milestones if applicable]</i>
Original Contract Price: \$ _____	Original Contract Times: Substantial Completion: _____ Ready for Final Payment: _____ days or dates
[Increase] [Decrease] from previously approved Change Orders No. ____ to No. ____: \$ _____	[Increase] [Decrease] from previously approved Change Orders No. ____ to No. ____: Substantial Completion: _____ Ready for Final Payment: _____ days
Contract Price prior to this Change Order: \$ _____	Contract Times prior to this Change Order: Substantial Completion: _____ Ready for Final Payment: _____ days or dates
[Increase] [Decrease] of this Change Order: \$ _____	[Increase] [Decrease] of this Change Order: Substantial Completion: _____ Ready for Final Payment: _____ days or dates
Contract Price incorporating this Change Order: \$ _____	Contract Times with all approved Change Orders: Substantial Completion: _____ Ready for Final Payment: _____ days or dates

RECOMMENDED:		ACCEPTED:		ACCEPTED:	
By: _____	By: _____	By: _____	By: _____	By: _____	By: _____
Engineer (if required)	Owner (Authorized Signature)	Contractor (Authorized Signature)			
Title: _____	Title _____	Title _____			
Date: _____	Date _____	Date _____			

Approved by Funding Agency (if applicable)

By: _____ Date: _____
Title: _____

Section U

Field Orders

Field Order No. _____

Date of Issuance:

Effective Date:

Owner: Greenville Utilities Commission

Owner's Contract No.:

Contractor:

Contractor's Project No.:

Engineer: Rummel, Klepper & Kahl, LLP

Engineer's Project No.: 1214-011

Project: GCP89 – Northwestern Loop High
Pressure Gas Main Extension

Contract Name:

Contractor is hereby directed to promptly execute this Field Order, issued in accordance with General Conditions Paragraph 11.01, for minor changes in the Work without changes in Contract Price or Contract Times. If Contractor considers that a change in Contract Price or Contract Times is required, submit a Change Proposal before proceeding with this Work.

Reference:

Specification(s)

Drawing(s) / Detail(s)

Description:

Attachments:

ISSUED:

RECEIVED:

By: _____
Engineer (Authorized Signature)

By: _____
Contractor (Authorized Signature)

Title: _____

Title: _____

Date: _____

Date: _____

Copy to: Owner

Section V

Technical Specifications

DOCUMENT 000100 – TECHNICAL SPECIFICATIONS TABLE OF CONTENTS

SPECIFICATION	DESCRIPTION	DATED
DIVISION 00	Procurement and Contracting Requirements	
000100	Technical Specifications Table of Contents	
000115	List of Drawing Sheets	
DIVISION 01	General Requirements	
011000	Summary of Work	
013100	Project Management and Coordination	
013200	Construction Progress Documentation	
013300	Submittal Procedure	
015100	Environmental Protection	
015200	Erosion and Sediment Control	
017419	Construction Waste Management and Disposal	
017839	Project Record Documents	
019113	General Commissioning Requirements	
019115	Pipeline Cleaning, Testing, Drying, Tie-In, Purging, and Gas-Up	
019120	Regulator Station Cleaning, Testing, Tie-In, Purging, and Gas-Up	
DIVISION 03	Concrete	
033000	Cast In Place Concrete	
DIVISION 05	Metals	
055101	Natural Gas Pipeline Welding	
055110	Steel Natural Gas Pipeline Construction	
055120	Regulator Station Construction	
DIVISION 26	Electrical	
264200	Cathodic Protection	
264210	AC Mitigation	
DIVISION 31	Earthwork	
311000	Clearing	
315001	Excavation, Trenching and Backfilling for Pipeline	
315010	Horizontal Directional Drilling	
315050	Jacking and Boring	
DIVISION 32	Exterior Improvements	
321100	Regulator Station Site Work	
321216	Asphalt Paving	
323113	Chain Link Fences and Gates	
329100	ROW Restoration	

END OF DOCUMENT 000100

DOCUMENT 000115 - LIST OF CONTRACT DRAWING SHEETS

1.1 LIST OF DRAWINGS

- A. Drawings: Drawings consist of the Contract Plans and Details listed in the Table of Contents on the cover page of the separately bound drawing sets titled:
1. **GCP89 - Western Loop High Pressure Gas Main**, dated June 1, 2015
 2. , as modified by subsequent Addenda and Contract modifications.
 3. **GCP89 - Highway 43 District Regulator Station**, dated June 1, 2015, as modified by subsequent Addenda and Contract modifications.
 4. **GCP89 - Old River Road District Regulator Station**, dated June 1, 2015, as modified by subsequent Addenda and Contract modifications.
- B. List of Contract Plan Sheets according to drawing set:
1. **GCP89 - Northwestern Loop High Pressure Gas Main Extension**, dated **June 1, 2015**.

Sheet Number	Sheet Description	Date
-	COVER SHEET	
G-1	GENERAL NOTES AND DRAWING LEGEND	
G-2	SPECIAL EASEMENT REQUIREMENTS	
A-1	PLAN AND PROFILE SHEET - STA 10+00 TO STA 24+75	
A-1A	PLAN SHEET - STA 10+00 TO STA 24+75	
A-1B	GATE 3 REGULATOR STATION SITE PLAN	
A-2	PLAN AND PROFILE SHEET - STA 24+75 TO STA 39+00	
A-2A	PLAN SHEET - STA 24+75 TO STA 39+00	
A-3	PLAN AND PROFILE SHEET - STA 39+00 TO STA 53+50	
A-4	PLAN AND PROFILE SHEET - STA 53+50 TO STA 62+25	
A-5	PLAN AND PROFILE SHEET - STA 62+25 TO STA 75+50	
A-6	PLAN AND PROFILE SHEET - STA 75+50 TO STA 89+50	
A-6A	PLAN AND PROFILE SHEET - STA 10+00 TO STA 13+65	
A-7	PLAN AND PROFILE SHEET - STA 89+50 TO STA 103+00	
A-8	PLAN AND PROFILE SHEET - STA 103+00 TO STA 116+75	
A-9	PLAN AND PROFILE SHEET - STA 116+75 TO STA 130+50	

Sheet Number	Sheet Description	Date
A-10	PLAN AND PROFILE SHEET - STA 130+50 TO STA 144+10	
A-11	PLAN AND PROFILE SHEET - STA 144+10 TO STA 158+50	
A-12	PLAN AND PROFILE SHEET - STA 158+50 TO STA 172+50	
A-13	PLAN AND PROFILE SHEET - STA 172+50 TO STA 176+32	
D-1	BILL OF MATERIALS	
D-2	PIPELINE DETAILS	
D-3	PIPELINE DETAILS	
ES-1	PIPELINE DETAILS	
ES-2	EROSION AND SEDIMENT CONTROL NOTES	
ES-3	EROSION AND SEDIMENT CONTROL NOTES	
ES-4	EROSION AND SEDIMENT CONTROL NOTES	
ES-5	EROSION AND SEDIMENT CONTROL NOTES	
CP-1	CATHODIC PROTECTION DETAILS AND BILL OF MATERIALS	
ACM-1	AC MITIGATION DETAILS	
ACM-2	AC MITIGATION DETAILS	
ACM-3	AC MITIGATION DETAILS AND BILL OF MATERIALS	
GT-1	GEOTECHNICAL BORE DATA	
GT-2	GEOTECHNICAL BORE DATA	
GT-3	GEOTECHNICAL BORE DATA	
GT-4	GEOTECHNICAL BORE DATA	
TC-0	TRAFFIC CONTROL KEY PLAN	
TC-1	TRAFFIC CONTROL NOTES, DRAWING LEGEND, AND PLAN AT CE-1	
TC-2	TRAFFIC CONTROL PLAN AT CONSTRUCTION ENTRANCE CE-1	
TC-3	TRAFFIC CONTROL PLAN AT CONSTRUCTION ENTRANCE CE-1	
TC-4	TRAFFIC CONTROL PLAN AT CONSTRUCTION ENTRANCE CE-1	
TC-5	TRAFFIC CONTROL PLAN AT CONSTRUCTION ENTRANCE CE-2	
TC-6	TRAFFIC CONTROL PLAN AT CONSTRUCTION ENTRANCE CE-2	

Sheet Number	Sheet Description	Date
TC-7	TRAFFIC CONTROL PLAN AT CONSTRUCTION ENTRANCE CE-2	
TC-8	TRAFFIC CONTROL PLAN AT CONSTRUCTION ENTRANCE CE-2	
TC-9	TRAFFIC CONTROL PLAN AT CONSTRUCTION ENTRANCE CE-2	
TC-10	TRAFFIC CONTROL PLAN AT CONSTRUCTION ENTRANCE CE-4	
TC-11	TRAFFIC CONTROL PLAN AT CONSTRUCTION ENTRANCE CE-4	
TC-12	TRAFFIC CONTROL PLAN AT CONSTRUCTION ENTRANCE CE-4	
TC-13	TRAFFIC CONTROL PLAN AT CONSTRUCTION ENTRANCE CE-4	
TC-14	TRAFFIC CONTROL PLAN AT CONSTRUCTION ENTRANCE CE-5	
TC-15	TRAFFIC CONTROL PLAN AT CONSTRUCTION ENTRANCE CE-5	
TC-16	TRAFFIC CONTROL PLAN AT CONSTRUCTION ENTRANCE CE-5	
TC-17	STANDARD TRAFFIC CONTROL DETAILS	

2. GCP89 – Highway 43 District Regulator Station, dated June 1, 2015.

Sheet Number	Sheet Description	Date
DR1-0	COVER SHEET	
DR1-1	BILL OF MATERIALS, DRAWING LEGEND AND GENERAL NOTES	
DR1-2	EXISTING CONDITIONS PLAN	
DR1-3	EXISTING SITE CONDITIONS PLAN	
DR1-4	PROPOSED SITE PLAN	
DR1-5	PROPOSED SITE GRADING PLAN	
DR1-6	PROPOSED SITE PLAN DETAIL	
DR1-7	PROPOSED PIPING PLAN	
DR1-8	PIPING SECTION AND DETAILS	
DR1-9	PIPELIN SECTION AND TIE-IN DETAIL	
DR1-10	PIPING SECTION	
DR1-11	PIPING SECTION AND DETAIL	

3. GCP89 – Old River Road District Regulator Station, dated June 1, 2015.

Sheet Number	Sheet Description	Date
DR2-0	COVER SHEET	
DR2-1	BILL OF MATERIALS, DRAWING LEGEND AND GENERAL NOTES	
DR2-2	EXISTING CONDITIONS PLAN	
DR2-3	PROPOSED SITE GRADING PLAN	
DR2-4	PROPOSED SITE PLAN	
DR2-5	PROPOSED SITE PLAN DETAIL	
DR2-6	PROPOSED PIPING PLAN	
DR2-7	PIPING SECTION AND DETAILS	
DR2-8	PIPING SECTION AND DETAILS	
DR2-9	PIPING SECTION	
DR2-10	PIPING SECTION AND DETAIL	

END OF DOCUMENT 000115

SECTION 011000 – SUMMARY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:

- 1. Project description.
- 2. Work covered by Contract Documents.
- 3. Work by Owner.
- 4. Owner-furnished products.
- 5. Contractor-furnished products.
- 6. Access to site.
- 7. Coordination with land owners and/or tenants
- 8. Work restrictions.
- 9. Specification and drawing conventions.
- 10. Miscellaneous provisions.

- B. Related Requirements:

- 1. Requirements resulting from permitting, easement and land acquisition
- 2. The WORK covered by these Specifications consists of the performance of all operations and the furnishing of all labor, equipment, supplies, incidental materials, and other facilities as required for the construction of the natural gas pipeline and two district regulator stations complete, tested, and accepted.
- 3. All WORK on the natural gas system and regulator stations shall be performed in accordance with:
 - a. Title 49 of the Code of Federal Regulations, Chapter I, Part 192 (49 CFR 192), "Transportation of Natural and Other Gas by Pipeline: Minimum Federal Safety Standards," and any other applicable standards which are hereby incorporated into these Specifications by reference.
 - b. The Greenville Utilities Commission Gas Department Natural Gas Operations and Maintenance Plan.
 - c. The pipeline is designed to meet the requirements for a natural gas main to be operated at less than 20% SMYS.
- 4. Safety

- a. Suitable barricades, lights, applicable signs, flagmen, and watchmen shall be provided when required by the Engineer and/or the North Carolina Department of Transportation in all areas in which Work is performed. All safety related equipment specified herein shall be in full compliance with the minimum governing regulation subject to approval of the Engineer and shall be included in the Contract price.
- b. General construction operations applicable to gas facilities installation shall be performed in accordance with Title 29 of the Code of Federal Regulations, Chapter I (29 CFR 1926), "Occupational Safety and Health Standards for the Construction Industry"; and any other applicable standards, which are hereby incorporated into these Specifications by reference.

1.3 PROJECT INFORMATION

- A. Project Identification: GCP89 - Northwestern Loop High Pressure Gas Main Extension.
 - 1. Project Location: Pitt County, North Carolina.
- B. Owner: Greenville Utilities Commission of the City of Greenville, North Carolina.
 - 1. Owner's Representative: F. Durward Tyson, Jr., P.E.
- C. Engineer: Rummel, Klepper & Kahl, LLP (RK&K).
- D. Engineer's Consultants: The Engineer has retained the following design professionals who have prepared designated portions of the Contract Documents:
 - 1. Stroud Engineering, PA – Project Surveying.
 - 2. S&ME – Project Geotechnical Services.
 - 3. Diversified Energy Services – Project Property and Easement Negotiations
- E. Construction Manager: Rummel, Klepper & Kahl, LLP.
 - 1. Construction Manager has been engaged for this Project to serve as an advisor to Owner and to provide assistance in administering the Contract for Construction between Owner and Contractor, according to a separate contract between Owner and Construction Manager.

1.4 WORK COVERED BY CONTRACT DOCUMENTS

- A. The Work of Project is defined by the Contract Documents and consists of the following:
 - 1. Fabricate, install, clean, test, purge, gas-up, tie-in, and commission:

- a. Approximately 3.3 miles of 6-inch API 5L GRB, 0.280-inch wall thickness, coated steel line pipe by conventional direct burial, horizontal directional drilling, and jack and bore methods;
 - b. Two district regulator stations complete with site, access, piping, equipment, electrification, SCADA interfacing, and fencing construction.
 - 2. The Contractor shall provide all cathodic protection (CP) Work as specified herein and described in the project Plans and Details. The steel pipeline shall contain an impressed current cathodic protection (CP) system.
 - a. Contractor shall commission the impressed current system.
 - 3. The Contractor shall provide all Alternating Current (AC) mitigation Work as specified herein and described in the project Plans and Details.
 - a. Contractor shall commission the impressed current system.
- B. Type of Contract:
- 1. Project will be constructed under a single prime contract.
 - a. GCP89 – Northwestern Loop High Pressure Gas Main Extension
 - b. Contract will be awarded as a Unit Price Contract.

1.5 PHASED CONSTRUCTION

- A. The Work shall be conducted in one (1) phase.
- B. Before commencing Work, submit an updated copy of Contractor's construction schedule showing the sequence, commencement and completion dates for the Work.

1.6 WORK BY OWNER

- A. General: Cooperate fully with Owner so work may be carried out smoothly, without interfering with or delaying work under this Contract or work by Owner. Coordinate the Work of this Contract with work performed by Owner.
- B. Preceding Work: Owner will perform the following construction operations at Project site. Those operations are scheduled to be substantially complete before work under this Contract begins.
 - 1. Purchase property for two district regulator sites.
 - 2. Acquire all easements identified during design as required for construction.
 - 3. Acquire all temporary work space (temporary construction easements) identified during design as required for construction.
 - 4. Acquire all highway encroachment agreements identified as needed during design.

5. Provide electric and telecommunication service to the two district regulator sites.
 6. Acquire all state and federal permits required for construction and testing.
 - C. Concurrent Work: Owner will perform the following construction operations at Project site. Those operations will be conducted simultaneously with work under this Contract.
 1. Installation of electric and telecommunication/SCADA services to regulator station sites and rectifier.
 2. Connection of Contractor installed station wiring to junction boxes, meters, terminal boxes, and RTUs will be completed by the Owner.
 - D. Subsequent Work: Owner will perform the following additional work at site after Substantial Completion. Completion of that work will depend on successful completion of preparatory work under this Contract.
 1. Install SCADA connections at district regulator stations.
- 1.7 WORK UNDER SEPARATE CONTRACTS
- A. There are no planned separate contracts.
- 1.8 FUTURE WORK
1. Not used.
- 1.9 PURCHASE CONTRACTS
1. Not used.
- 1.10 OWNER-FURNISHED MATERIALS
- A. Owner will furnish products and materials indicated on the Bills of Materials in the Project Drawings. The Work includes receiving, unloading, handling, storing, protecting, and installing Owner-furnished products, testing, and tying-in to the existing natural gas distribution system. The Contractor shall regulate supplies so that at all times there will be a sufficient quantity of material on site to prevent delaying the Work.
- 1.11 CONTRACTOR-FURNISHED PRODUCTS
- A. Contractor shall furnish all products, materials, equipment not listed as Owner-Furnished in the in these Specifications.
 - B. Contractor-Furnished, Owner-Installed Products:
-

1. None.

1.12 ACCESS TO SITE

- A. General: Contractor shall have full use of Project site for construction operations during construction period. Contractor's use of Project site is limited only by Owner's right to perform work or to retain other contractors on portions of Project.
- B. Work restrictions apply to accessing site from NC Hwy 264 Bypass.

1.13 WORK RESTRICTIONS

- A. Work Restrictions, General: Comply with restrictions on construction operations.
 1. Comply with limitations on use of public streets and with other requirements of authorities having jurisdiction.
 2. Comply with NCDOT Highway Encroachment requirements for limited access and specific work hours along the NC Hwy 264 Bypass.
- B. On-Site Work Hours: During normal business working hours of 8:00 a.m. to 5:00 p.m., Monday through Friday, unless otherwise indicated.
 1. Weekend Hours: As approved by Owner.
 2. Early Morning Hours: As approved by Owner.
 3. Hours for Utility Shutdowns: Not applicable.
 4. The following general conditions apply to work involving access to the site from NC Hwy 264 Bypass, and work within the NCDOT Hwy 264 right-of-way unless modified by NCDOT or otherwise directed by Owner/Engineer:
 - a. Do not close or narrow lanes as follows:
 - 1) 3:30 PM to 9:00 AM Monday through Saturday
 - 2) Lane closures will be allowed on Sunday during daylight hours
 - b. Do not close or narrow travel lanes during holidays and special events as follows:
 - 1) Holiday
 - a) For any unexpected occurrence that creates unusually high traffic volumes, as directed by the Engineer;
 - b) For New Years between the hours of 3:30 PM December 31st to 9:00 AM January 2nd. If New Years Day is on a Friday, Saturday, Sunday, or Monday, then until 9:00AM the following Tuesday;
 - c) For Easter, between the hours of 3:30 PM Thursday and 8:00 AM Monday;
 - d) For Memorial Day, between the hours of 3:30 PM Friday and 8:00 AM Tuesday;
 - e) For Independence Day, between the hours of 3:30 PM the day before Independence Day and 8:00 AM the day after Independence Day. If Independence Day is on a Friday, Saturday, Sunday, or Monday, then between the hours of 3:30 PM the Thursday before Independence Day and 8:00 AM the Tuesday after Independence Day; and

f) The day of the Spring ECU Football Game.

C. Employee Screening: Comply with Owner's requirements for drug, alcohol and background screening of Contractor personnel working on Project site.

1. Maintain list of approved screened personnel with Owner's representative.

1.14 SPECIFICATION AND DRAWING CONVENTIONS

A. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:

1. Imperative mood and streamlined language are generally used in the Specifications. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.
2. Specification requirements are to be performed by Contractor unless specifically stated otherwise.
3. In addition to the Specifications, the project Drawings (Plans) include notes, details, conditions, and special provisions that supplement and clarify the project Specification, Plans and Permit requirements. The requirements of these notes, details, conditions, and special provisions are to be performed by the Contractor.
4. The Steel Alignment Sheets were developed from digital files obtained from the NCDOT. All features shown on these drawings, such as the trees, roads, edge of pavement, and buildings are located on these sheets as seen from the aerial photography and not a site survey. A planimetric site survey was performed within the existing utility easements to verify and correct the drawings where needed. The contour lines are developed from LIDAR at a 10-foot contour interval with 2-foot interpolated contour lines. Additional topographic surveys were performed at the crossing locations to provide more accurate vertical detail for design and at the regulator station sites. The pipe was positioned from a field investigation of the pipeline route and is located on the alignment sheets in reference to existing rights of way, structures, fence lines, or edge of pavement (EP) as determine in the field. The location of existing structures and pavement edges on the alignment sheets may be distorted slightly in some areas, however the dimensional call outs of the pipe location is accurate to true physical conditions. Underground utilities are shown on the plans as located by Greenville Utilities and locating services provided through Carolina One-Call. Utility locations were verified with existing mapping and surface features, and test holes where indicated on the plans.

B. Division 01 General Requirements: Requirements of Sections in Division 01 apply to the Work of all Sections in the Specifications.

1.15 MISCELLANEOUS PROVISIONS

A. None.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 011000

SECTION 013100 - PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:
 - 1. General coordination procedures.
 - 2. Coordination drawings.
 - 3. Requests for Information (RFIs).

1.3 DEFINITIONS

- A. RFI: Request from Owner, Construction Manager, Engineer, or Contractor seeking information required by or clarifications of the Contract Documents.

1.4 INFORMATIONAL SUBMITTALS

- A. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work. Include the following information in tabular form:
 - 1. Name, address, and telephone number of entity performing subcontract or supplying products.
 - 2. Services subcontractor will perform.
- B. Key Personnel Names: Within 10 working days of starting construction operations, submit a list of key personnel assignments, including superintendent and other personnel in attendance at Project site. Identify individuals and their duties and responsibilities; list addresses and telephone numbers, including, office, and cellular telephone numbers and e-mail addresses. Provide names, addresses, and telephone numbers of individuals assigned as alternates in the absence of individuals assigned to Project.
 - 1. Submit the list to the Owner's Project Manager, Engineer and key Contractor and Subcontractor staff.

2. The Gas Department requires contractors that perform covered tasks on its system that are identified in the Gas Department's Operator Qualification Plan to ***provide their own Operator Qualification Plan and individual qualifications***.
 - a. Owner will review the Contractor's Operator Qualification Plan, including their defined covered tasks. The review shall determine:
 - 1) If the plan meets the requirements of §192.805, and
 - 2) If the identified covered tasks meet the requirements of the work to be performed on the GUC's natural gas system.
 - b. Owner will review the Contractor's individual employee qualifications to determine if all anticipated tasks to be performed during the work have qualified individuals to perform or to supervise the work.
3. As applicable, post copies of list in project meeting room and in temporary field offices.

1.5 GENERAL COORDINATION PROCEDURES

- A. Coordination: Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations, included in different Sections, that depend on each other for proper installation, connection, and operation.
 1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
 2. Coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair.
 3. Make adequate provisions to accommodate items scheduled for later installation.
- B. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities and Owner's construction crews to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:
 1. Preparation of Contractor's construction schedule.
 2. Preparation of the schedule of values.
 3. Installation and removal of temporary facilities and controls.
 4. Delivery and processing of submittals.
 5. Progress meetings.
 6. Preinstallation conferences.
 7. Project closeout activities.
 8. Startup and adjustment of systems.
- C. Conservation: Coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water, and materials. Coordinate use of temporary utilities to minimize waste.

1. Salvage materials and equipment involved in performance of, but not actually incorporated into, the Work. See other Sections for disposition of salvaged materials that are designated as Owner's property.

1.6 COORDINATION DRAWINGS

- A. Not used.

1.7 REQUESTS FOR INFORMATION (RFIs)

- A. General: Immediately on discovery of the need for additional information or interpretation of the Contract Documents, Contractor shall prepare and submit an RFI in the form specified.
 1. Coordinate and submit RFIs in a prompt manner so as to avoid delays in Contractor's work or work of subcontractors.
- B. Content of the RFI: Include a detailed, legible description of item needing information or interpretation and the following:
 1. Project name.
 2. Project number.
 3. Date.
 4. Name of Contractor.
 5. Name of Engineer and Construction Manager.
 6. RFI number, numbered sequentially.
 7. RFI subject.
 8. Specification Section number and title and related paragraphs, as appropriate.
 9. Drawing number and detail references, as appropriate.
 10. Field dimensions and conditions, as appropriate.
 11. Contractor's suggested resolution. If Contractor's suggested resolution impacts the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
 12. Contractor's signature.
 13. Attachments: Include sketches, descriptions, measurements, photos, Product Data, Shop Drawings, coordination drawings, and other information necessary to fully describe items needing interpretation.
 - a. Include dimensions, survey station(s), and details of affected materials, assemblies, and attachments on attached sketches.
- C. RFI Forms: Software-generated form with substantially the same content as indicated above, acceptable to Engineer.
 1. Attachments shall be electronic files in Adobe Acrobat PDF format.
- D. Engineer's and Construction Manager's Action: Engineer and Construction Manager will review each RFI, determine action required, and respond. Allow five (5) working days for Engineer's

response for each RFI. RFIs received by Engineer or Construction Manager after 1:00 p.m. will be considered as received the following working day.

1. The following Contractor-generated RFIs will be returned without action:
 - a. Requests for approval of submittals.
 - b. Requests for approval of substitutions.
 - c. Requests for approval of Contractor's means and methods.
 - d. Requests for coordination information already indicated in the Contract Documents.
 - e. Requests for adjustments in the Contract Time or the Contract Sum.
 - f. Requests for interpretation of Engineer's actions on submittals.
 - g. Incomplete RFIs or inaccurately prepared RFIs.
2. Engineer's action may include a request for additional information, in which case Engineer's time for response will date from time of receipt of additional information.
3. ENGINEER's action on RFIs that may result in a change to the Contract Time or the Contract Sum may be eligible for Contractor to submit Change Proposal according to Section 012600 "Contract Modification Procedures."
 - a. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Engineer in writing within five (5) days of receipt of the RFI response.
- E. On receipt of Engineer's and Construction Manager's action, immediately distribute the RFI response to affected parties. Review response and notify Engineer within five (5) days if Contractor disagrees with response.
 1. Identification of related Field Order, Work Change Directive, and Proposal Request, as appropriate.

1.8 PROJECT WEB SITE

- A. Not used.

1.9 PROJECT MEETINGS

- A. General: Construction Manager will schedule and conduct meetings and conferences at Project site unless otherwise indicated.
- B. Preconstruction Conference: Owner will schedule and conduct Schedule and conduct a preconstruction conference before starting construction, at a time convenient to Owner and Engineer, according to the project schedule and after execution of the Agreement.
 1. Minutes: Entity responsible for conducting meeting will record and distribute meeting minutes.

- C. Pre-Commissioning Cleaning, Testing, Drying, Purging, and Gas-up Conference: Construction Manager will schedule a conference a minimum of ten (10) working days prior to the commencement of facility commissioning.
 - 1. A minimum of five working days prior to the conference, Contractor shall deliver his written plan for Cleaning, Testing, Drying, Purging, Tying-in, and Gas-up of the pipeline and facilities.
 - 2. Contractor will review his commissioning procedure with Owner, Engineer and Construction Manager and all personal critical to the success of the commissioning.
 - 3. Contractor shall present and discuss his commissioning safety plan.
 - 4. Requirements apply to pipeline and regulator stations.

- D. Project Closeout Conference: Construction Manager will schedule and conduct a project closeout conference, at a time convenient to Owner and Engineer, but no later than ten (10) days prior to the scheduled date of Substantial Completion.
 - 1. Conduct the conference to review requirements and responsibilities related to Project closeout.
 - 2. Attendees: Authorized representatives of Owner, Construction Manager, Engineer, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the meeting. Participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
 - 3. Agenda: Discuss items of significance that could affect or delay Project closeout, including the following:
 - a. Preparation of record documents.
 - b. Procedures required prior to inspection for Substantial Completion and for final inspection for acceptance.
 - c. Submittal of written warranties.
 - d. Preparation of Contractor's punch list.
 - e. Procedures for processing Applications for Payment at Substantial Completion and for final payment.
 - f. Submittal procedures.
 - 4. Minutes: Entity conducting meeting will record and distribute meeting minutes.

- E. Progress Meetings: Construction Manager will conduct progress meetings at biweekly intervals.
 - 1. Attendees: In addition to representatives of Owner, Construction Manager, and Engineer, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
 - 2. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.

- a. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's construction schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
 - 1) Review schedule for next period.
- b. Review present and future needs of each entity present, including the following:
 - 1) Interface requirements.
 - 2) Sequence of operations.
 - 3) Deliveries.
 - 4) Off-site fabrication.
 - 5) Access.
 - 6) Site utilization.
 - 7) Temporary facilities and controls.
 - 8) Progress cleaning.
 - 9) Quality and work standards.
 - 10) Status of correction of deficient items.
 - 11) Field observations.
 - 12) Status of RFIs.
 - 13) Status of proposal requests.
 - 14) Pending changes.
 - 15) Status of Change Orders.
 - 16) Pending claims and disputes.
 - 17) Documentation of information for payment requests.
3. Minutes: Entity responsible for conducting the meeting will record and distribute the meeting minutes to each party present and to parties requiring information.
 - a. Schedule Updating: Revise Contractor's construction schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 013100

SECTION 013200 - CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:
 - 1. Startup construction schedule.
 - 2. Contractor's construction schedule.
 - 3. Construction schedule updating reports.
 - 4. Daily construction reports.
 - 5. Special reports.
- B. Related Requirements:
 - 1. Section 013300 "Submittal Procedures" for submitting schedules and reports.

1.3 DEFINITIONS

- A. Activity: A discrete part of a project that can be identified for planning, scheduling, monitoring, and controlling the construction project. Activities included in a construction schedule consume time and resources.
 - 1. Critical Activity: An activity on the critical path that must start and finish on the planned early start and finish times.
 - 2. Predecessor Activity: An activity that precedes another activity in the network.
 - 3. Successor Activity: An activity that follows another activity in the network.
- B. Cost Loading: The allocation of the schedule of values for the completion of an activity as scheduled. The sum of costs for all activities must equal the total Contract Sum unless otherwise approved by Engineer.
- C. CPM: Critical path method, which is a method of planning and scheduling a construction project where activities are arranged based on activity relationships. Network calculations determine when activities can be performed and the critical path of Project.
- D. Critical Path: The longest connected chain of interdependent activities through the network schedule that establishes the minimum overall Project duration and contains no float.

- E. Event: The starting or ending point of an activity.
- F. Float: The measure of leeway in starting and completing an activity.
 - 1. Float time is not for the exclusive use or benefit of either Owner or Contractor, but is a jointly owned, expiring Project resource available to both parties as needed to meet schedule milestones and Contract completion date.
 - 2. Free float is the amount of time an activity can be delayed without adversely affecting the early start of the successor activity.
 - 3. Total float is the measure of leeway in starting or completing an activity without adversely affecting the planned Project completion date.
- G. Resource Loading: The allocation of manpower and equipment necessary for the completion of an activity as scheduled.

1.4 INFORMATIONAL SUBMITTALS

- A. Format for Submittals: Submit required submittals in the following format:
 - 1. PDF electronic file, or.
 - 2. Two paper copies.
- B. Startup construction schedule.
- C. Contractor's Construction Schedule: Initial schedule, of size required to display entire schedule for entire construction period.
 - 1. Submit a working electronic copy of schedule in PDF format and labeled to comply with requirements for submittals. Submit to all parties that need to know the schedule. Include type of schedule (initial or updated) and date on label, or
 - 2. Submit paper copies to all parties involved with the work that need to know the schedule.

1.5 QUALITY ASSURANCE

- A. Prescheduling Conference: Conduct conference at Project site to comply with requirements in Section 013100 "Project Management and Coordination." Review methods and procedures related to the preliminary construction schedule and Contractor's construction schedule, including, but not limited to, the following:
 - 1. Review software limitations and content and format for reports.
 - 2. Verify availability of qualified personnel needed to develop and update schedule.
 - 3. Discuss constraints, including work stages and interim milestones.
 - 4. Review requirements for tests and inspections by independent testing and inspecting agencies.
 - 5. Review time required for Project closeout and startup procedures, including commissioning activities.

6. Review and finalize list of construction activities to be included in schedule.
7. Review procedures for updating schedule.

1.6 COORDINATION

1. Coordinate Contractor's schedule with Owner's service date requirements.

PART 2 - PRODUCTS

2.1 CONTRACTOR'S CONSTRUCTION SCHEDULE, GENERAL

- A. Time Frame: Extend schedule from date established for the Notice to Proceed to date of Substantial Completion.
- B. Activities: Include activities such as installation of erosion and sediment control measures, clearing and grubbing, constructing construction entrances, stringing pipe, welding, x-raying, hydrotesting, etc. on the schedule.
- C. Constraints: Include constraints and work restrictions indicated in the Contract Documents and show how the sequence of the Work is affected.
 1. Work Restrictions: Show the effect of the following items on the schedule:
 - a. Uninterruptible services.
 - b. Use of premises restrictions.
 - c. NCDOT work restrictions along NC Hwy 264 Bypass
 - d. Seasonal variations.
 - e. Environmental control.
 2. Other Constraints: As imposed by permit, encroachment and easement requirements.
- D. Milestones: Include milestones indicated in the Contract Documents in schedule, including, but not limited to, the Notice to Proceed, Substantial Completion, and final completion, and the following interim milestones:
 1. Mobilization.
 2. Start and finish dates for each spread or portion of work.
 3. NDT (x-ray) test dates.
 4. Start of drilling and proposed completion of each horizontal directional drill (HDD) or crossing.
 5. All cleaning (pigging) dates.
 6. All testing dates,
 7. All drying dates.
 8. All tie-in dates.
 9. All gas-up dates.
 10. Regulator station start of construction dates.
 11. Regulator station testing dates.
 12. Regulator station tie-in dates.
 13. Regulator station completion dates.

- E. Upcoming Work Summary: Prepare summary report indicating activities scheduled to occur or commence prior to submittal of next schedule update. Summarize the following issues:
 - 1. Unresolved issues.
 - 2. Unanswered Requests for Information.
 - 3. Pending modifications affecting the Work and Contract Time.
- F. Recovery Schedule: When periodic update indicates the Work is ten (10) or more calendar days behind the current approved schedule, submit a separate recovery schedule indicating means by which Contractor intends to regain compliance with the schedule. Indicate changes to working hours, working days, crew sizes, and equipment required to achieve compliance; and date by which recovery will be accomplished.

2.2 STARTUP CONSTRUCTION SCHEDULE

- A. Bar-Chart Schedule: Submit startup, horizontal, bar-chart-type construction schedule within seven (7) days of date established for commencement of the Work.
- B. Contract Modifications: For each proposed contract modification and concurrent with its submission, address the time-impact of the proposed change on the overall project schedule.
- C. Schedule Updating: Maintain an up to date construction schedule during construction.
- D. Value Summaries:
 - 1. Prepare list for ease of comparison with payment requests; coordinate timing with invoice submittals.
 - a. In both value summary lists, tabulate "actual percent complete" and "cumulative value completed" with total at bottom.
 - b. Submit value summary reports with each regularly scheduled monthly invoice submittal.
 - c. Submit value summaries on form included in Section O of the Contract Documents.

2.3 REPORTS

- A. Daily Construction Reports: Prepare a daily construction report recording the following information concerning events at Project site:
 - 1. List of subcontractors at Project site.
 - 2. Material delivered to job site.
 - 3. Materials installed.
 - 4. High and low temperatures and general weather conditions, including presence of rain or snow.
 - 5. Accidents.
 - 6. Meetings and significant decisions.
 - 7. Unusual events (see special reports).

8. Stoppages, delays, shortages, and losses.
 9. Emergency procedures.
 10. Orders and requests of authorities having jurisdiction.
 11. Change Orders received and implemented.
 12. Change Directives received and implemented.
 13. Tie-ins made.
 14. Equipment or system tests and startups.
 15. Partial completions and occupancies.
 16. Substantial Completions authorized.
- B. Site Condition Reports: Immediately on discovery of a difference between site conditions and the Contract Documents, prepare and submit a detailed report. Submit with a Request for Information. Include a detailed description of the differing conditions, together with recommendations for changing the Contract Documents.

2.4 SPECIAL REPORTS

- A. General: Submit special reports directly to Engineer within one (1) day(s) of an occurrence. Distribute copies of report to parties affected by the occurrence.
- B. Reporting Unusual Events: When an event of an unusual and significant nature occurs at Project site, whether or not related directly to the Work, prepare and submit a special report. List chain of events, persons participating, response by Contractor's personnel, evaluation of results or effects, and similar pertinent information. Advise Engineer in advance when these events are known or predictable.

PART 3 - EXECUTION

3.1 CONTRACTOR'S CONSTRUCTION SCHEDULE

- A. Contractor's Construction Schedule Updating: At bi-weekly intervals, update schedule to reflect actual construction progress and activities. Issue schedule one day before each regularly scheduled progress meeting.
1. Revise schedule immediately after each meeting or other activity where revisions have been recognized or made. Issue updated schedule concurrently with the report of each such meeting.
 2. As the Work progresses, indicate final completion percentage for each activity.
- B. Distribution: Distribute copies of approved schedule to Engineer, Construction Manager, Owner, separate contractors, testing and inspecting agencies, and other parties identified by Contractor with a need-to-know schedule responsibility.
1. Post copies in temporary field offices if applicable.
 2. When revisions are made, distribute updated schedules to the same parties and post in the same locations. Delete parties from distribution when they have completed their

- assigned portion of the Work and are no longer involved in performance of construction activities.
3. Digital distribution of PDF schedules is acceptable as long as receiving parties have capability of receiving and reading on a timely basis.

END OF SECTION 013200

SECTION 013300 - SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes requirements for the submittal schedule and administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other submittals.
- B. Related Requirements:
 - 1. Section 013100 "Project Management and Coordination" for submitting Operator Qualification Plan and employee qualifications.
 - 2. Section 013100 "Project Management and Coordination" for submitting proof of participating in a DOT approved Drug and Alcohol Screening Program.
 - 3. Section 013200 "Construction Progress Documentation" for submitting schedules and reports, including Contractor's construction schedule.
 - 4. Section 013200 "Construction Progress Documentation" for submitting Applications for Payment and the schedule of values.
 - 5. Section O "Contractor's Application for Payment" for payment application form.
 - 6. Section 015200 "Welding Natural Gas Pipeline" for welders' qualifications and for submitting x-ray test results and records.
 - 7. Section 017839 "Project Record Documents" for submitting pipeline record Drawings, horizontal directional drill bore plots, and regulator station record drawings.
 - 8. Section 019113 "Pipeline Cleaning, Testing, drying, Tie-in, Purging, and Gas-up" for submitting hydrostatic test records.
 - 9. Section 019120 "Regulator Station Testing, Tie-in, Purging, Gas-up and Commissioning" for submitting air test records.

1.3 DEFINITIONS

- A. Action Submittals: Written and graphic information and physical samples that require Engineer's and Construction Manager's responsive action. Action submittals are those submittals indicated in individual Specification Sections as "action submittals."
- B. Informational Submittals: Written and graphic information and physical samples that do not require Engineer's and Construction Manager's responsive action. Submittals may be rejected for not complying with requirements. Informational submittals are those submittals indicated in individual Specification Sections as "informational submittals."

- C. File Transfer Protocol (FTP): Communications protocol that enables transfer of files to and from another computer over a network and that serves as the basis for standard Internet protocols. An FTP site is a portion of a network located outside of network firewalls within which internal and external users are able to access files.
- D. Portable Document Format (PDF): An open standard file format licensed by Adobe Systems used for representing documents in a device-independent and display resolution-independent fixed-layout document format.
- E. SharePoint Site: A dedicated site on a server that contains project files and is accessible by the project team and Owner and others given permission by the site owner.

1.4 SUBMITTALS

- A. The Contractor shall transmit submittals on the Contractor's letterhead and transmittal form.
- B. Submittal Description (SD): Drawings, diagrams, layouts, schematics, descriptive literature, illustrations, schedules, performance and test data, and similar materials to be furnished by the Contractor explaining in detail specific portions of the WORK required by the contract.
- C. The following items, SD-01 through SD-06, are descriptions of data to be submitted for the project. The requirements to actually furnish the applicable items will be called out in each specification.

SD-01 Preconstruction Submittals

Submittals which are required prior to a notice to proceed on a new contract. Submittals required prior to the start of the next major phase of the construction on a multi-phase contract. Schedules or tabular list of data or tabular list including location, features, or other pertinent information regarding products, materials, equipment, or components to be used in the WORK, submitted prior to contract notice to proceed or next major phase of construction.

SD-03 Product Data

Data composed of catalog cuts, brochures, circulars, specifications and product data, and printed information in sufficient detail and scope to verify compliance with requirements of the contract documents.

SD-06 Test Reports

Include: written reports of a manufacturer's findings of his product during shop tests; written reports by Contractor or his subcontractors including final test reports and daily logs reporting on the progress of daily activities or attesting that the Work has been installed in accordance with the contract plans and specifications.

SD-07 Certificates

A document, required of the Contractor, or through the Contractor by way of a supplier, installer, manufacturer, or other lower tier subcontractor, the purpose of which is to further the quality or orderly progression of a portion of the Work by documenting procedures, acceptability of methods or personnel, qualifications, or other verification of quality.

SD-08 Manufacturer's Instructions

Preprinted material describing installation of a product, system, or material, including special notices and material safety data sheets, if any concerning impedances, hazards, and safety precautions.

SD-11 Closeout Submittals

Include special requirements necessary to properly close out a construction contract; for example: as-built data, manufacturer's help and product lines necessary to maintain equipment.

1.5 SUBMITTAL ADMINISTRATIVE REQUIREMENTS

A. Marking

1. Permanent marking shall be provided on each submittal to identify it by contract number; transmittal date; Contractor's, subcontractor's, and supplier's name, address(es) and telephone number(s); submittal name; specification and/or drawing reference; and similar information to distinguish it from other submittals. Submittal identification shall include space to receive the review action by Engineer.

1.6 SUBMISSION REQUIREMENTS

A. Schedules

1. Within 10 days of notice to proceed, the Contractor shall provide, for approval by Engineer, the following schedule of submittals:
 - a. A schedule of technical submittals required by the specifications and drawings. Schedule shall indicate the specification or drawing reference requiring the submittal; the material, item, or process for which the submittal is required; the "SD" number and identifying title of the submittal; the Contractor's anticipated submission date and the approval need date. Alternatively, the Contractor may utilize the submittal schedule provided by the Engineer.
 - b. Submittals called for by the contract documents will be listed on the above schedule.

- c. Copies of schedule shall be re-submitted monthly annotated by the Contractor with actual submission and approval dates. When all items on a schedule have been fully approved, no further re-submittal of the schedule is required.
- B. Data Submittals
 - 1. As applicable, four [4] complete sets of indexed and bound product data shall be submitted. One [1] set, marked with review notations by Engineer, will be returned to the Contractor.
 - a. Very few product data submittals by Contractor are anticipated for this Project.

1.7 ENGINEER'S REVIEW

- A. Review Notations
 - 1. Engineer will review submittals and provide pertinent notation within 10 calendar days after date of submission. Submittals will be returned to the Contractor with the following notations:
 - a. Submittals marked "approved" authorize the Contractor to proceed with the WORK covered.
 - b. Submittals marked "approved as noted" authorize the Contractor to proceed with the WORK covered provided he takes no exception to the corrections. Notes shall be incorporated prior to submission of the final submittal.
 - c. Submittals marked "return for correction" require the Contractor to make the necessary corrections and revisions and to re-submit them for approval in the same routine as before, prior to proceeding with any of the Work depicted by the submittal.
 - d. Submittals marked "not approved" or "disapproved" indicate noncompliance with the contract requirements and shall be re-submitted with appropriate changes.
No item of requiring a submittal shall be accomplished until the submittals are approved or approved as noted.
 - e. Contractor shall make corrections required by Engineer. If the Contractor considers any correction or notation on the returned submittals to constitute a change to the contract drawings or specifications; notice as required under the clause entitled, "Changes" shall be given to Engineer.
 - f. If changes are necessary to approved submittals, the Contractor shall make such revisions and submission of the submittals in accordance with the procedures above. No item of Work requiring a submittal change shall be accomplished until the changed submittals are approved.

PART 2 - PRODUCTS

2.1 Not Applicable

PART 3 - EXECUTION

A. Not Applicable

END OF SECTION 013300

SECTION 015100 – ENVIRONMENTAL PROTECTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.
- B. 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. U.S. National Archives and Records Administration (NARA)
 - a. 33 CFR 328 (25 August 1993)
 - 1) Definition of Waters of the United States
 - b. 40 CFR 261 (01 July 2012)
 - 1) Identification and Listing of Hazardous Waste
 - c. 49 CFR 171 – 178 (01 October 2012)
 - 1) Hazardous Materials Regulations
 - 2. U.S. Army Corps of Engineers (USACE)
 - a. Wetlands Delineation Manual (January 1987)
 - 1) Corps of Engineers Wetlands Delineation Manual Technical Report Y-87-1

1.2 DEFINITIONS

- A. Environmental Pollution and Damage:
Environmental pollution and damage is the presence of chemical, physical, or biological elements or agents which adversely affect human health or welfare; unfavorably alter ecological balances of importance to human life; affect other species of importance to humankind; or degrade the environment aesthetically, culturally and/or historically.
- B. Environmental Protection:
Environmental protection is the prevention/control of pollution and habitat disruption that may occur to the environment during construction. The control of environmental pollution and damage requires consideration of land, water, and air; biological and cultural resources; and includes management of visual aesthetics; noise; solid, chemical, gaseous, and liquid waste; radiant energy and radioactive material as well as other pollutants.
- C. Contractor Generated Hazardous Waste:
Contractor generated hazardous waste means materials that, if abandoned or disposed of, may meet the definition of a hazardous waste. These waste streams would typically consist of material brought on site by the Contractor to execute Work, but are not fully consumed during the course of construction. Examples include, but are not limited to, excess paint thinners (i.e. methyl ethyl ketone, toluene etc.), waste thinners, excess paints, excess solvents, waste solvents, and excess pesticides, and contaminated pesticide equipment rinse water.

- D. Land Application for Discharge Water:
The term "Land Application" for discharge water implies that the Contractor shall discharge water at a rate which allows the water to percolate into the soil. No sheeting action, soil erosion, discharge into storm sewers, discharge into defined drainage areas, or discharge into the "waters of the United States" shall occur. Land Application shall be in compliance with all applicable Federal, State, and local laws and regulations.
- E. Surface Discharge:
The term "Surface Discharge" implies that the water is discharged with possible sheeting action and subsequent soil erosion may occur. Waters that are surface discharged may terminate in drainage ditches, storm sewers, creeks, and/or "waters of the United States" and would require a permit to discharge water from the governing agency.
- F. Waters of the United States:
All waters which are under the jurisdiction of the Clean Water Act, as defined in 33 CFR 328.
- G. Wetlands:
Wetlands means those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, and bogs. Official determination of whether or not an area is classified as a wetland must be done in accordance with Wetlands Delineation Manual.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 LAND RESOURCES

- A. The Contractor shall confine all activities to areas defined by the drawings and specifications. Prior to the beginning of any construction, the Contractor shall identify any land resources to be preserved within the Work area. Except in areas indicated on the drawings or specified to be cleared, the Contractor shall not remove, cut, deface, injure, or destroy land resources including trees, shrubs, vines, grasses, topsoil, and land forms without approval. No ropes, cables, or guys shall be fastened to or attached to any trees for anchorage unless specifically authorized. The Contractor shall provide effective protection for land and vegetation resources at all times as defined in the following subparagraphs. Stone, soil, or other materials displaced into uncleared areas shall be removed by the Contractor.
- B. WORK Area Limits
 - 1. Prior to commencing construction activities, the Contractor shall mark the areas that need not be disturbed under this contract. Isolated areas within the general WORK area which are not to be disturbed shall be marked. Monuments and markers shall be protected before construction operations commence. The Contractor's personnel shall be knowledgeable of the purpose for marking and/or protecting particular objects.

C. Landscape

1. Trees, shrubs, vines, grasses, land forms and other landscape features indicated and defined on the drawings to be preserved shall be clearly identified by marking, fencing, or wrapping with boards, or any other approved techniques. The Contractor shall restore landscape features damaged or destroyed during construction operations outside the limits of the approved Work area.

D. Erosion and Sediment Controls

1. The Contractor shall be responsible for providing erosion and sediment control measures in accordance with the specifications and plans and all Federal, State, and local laws and regulations. The area of bare soil exposed at any one time by construction operations should be kept to a minimum. The Contractor shall construct or install temporary and permanent erosion and sediment control best management practices (BMPs) as indicated on the drawings. BMPs may include, but not be limited to, vegetation cover, stream bank stabilization, slope stabilization, silt fences construction of terraces, interceptor channels, sediment traps, inlet and outfall protection, diversion channels, and sedimentation basins. Any temporary measures shall be removed after the area has been stabilized.

E. CONTRACTOR Facilities and WORK Areas

1. Erosion and sediment controls shall be provided for on-site borrow and spoil areas to prevent sediment from entering nearby waters. Temporary excavation and embankments for plant and/or Work areas shall be controlled to protect adjacent areas.

F. Water Resources

1. The Contractor shall monitor construction activities to prevent pollution of surface and ground waters. Toxic or hazardous chemicals shall not be applied to soil or vegetation unless otherwise indicated. All water areas affected by construction activities shall be monitored by the Contractor.

G. Stream Crossings

1. Stream crossings shall allow movement of materials or equipment without violating water pollution control standards of the Federal, State, and local governments. Construction of stream crossing structures shall be in compliance with Clean Water Act Section 404, Nation Wide Permit No. 12, and Section 10 of Rivers and Harbors Act.

H. Wetlands

1. The Contractor shall not enter, disturb, destroy, or allow discharge of contaminants into any wetlands. The Contractor shall be responsible for the protection of the wetlands shown on the drawings in accordance with all Environmental Permits and Approvals.

3.2 BURNING

- A. Burning shall not be allowed on the project site.

3.3 SOLID WASTES

- A. Solid wastes (excluding clearing debris) shall be placed in containers which are emptied on a regular schedule. Handling, storage, and disposal shall be conducted to prevent contamination. Segregation measures shall be employed so that no hazardous or toxic waste will become co-mingled with solid waste. Waste materials shall be disposed of in a timely manner at an authorized disposal facility.
- B. **CONTRACTOR GENERATED HAZARDOUS WASTES/EXCESS HAZARDOUS MATERIALS**
 - 1. Hazardous wastes are defined in 40 CFR 261, or are as defined by applicable State and local regulations. Hazardous materials are defined in 49 CFR 171 - 178. The Contractor shall, at a minimum, manage and store hazardous waste in accordance with all Federal, State and local laws and regulations. The Contractor shall take sufficient measures to prevent spillage of hazardous and toxic materials during dispensing. The Contractor shall segregate hazardous waste from other materials and wastes, shall protect it from the weather by placing it in a safe covered location, and shall take precautionary measures such as berming or other appropriate measures against accidental spillage. The Contractor shall be responsible for storage, describing, packaging, labeling, marking, and placarding of hazardous waste and hazardous material in accordance with 49 CFR 171 - 178, State, and local laws and regulations. The Contractor shall transport Contractor generated hazardous waste in accordance with the Environmental Protection Agency and the Department of Transportation laws and regulations. The Contractor shall dispose of hazardous waste in compliance with Federal, State and local laws and regulations. Spills of hazardous or toxic materials shall be immediately reported to the Engineer and the Owner. Cleanup and cleanup costs due to spills shall be the Contractor's responsibility. The disposition of Contractor generated hazardous waste and excess hazardous materials are the Contractor's responsibility.
- C. **FUEL AND LUBRICANTS**
 - 1. Storage, fueling and lubrication of equipment and motor vehicles shall be conducted in a manner that affords the maximum protection against spill and evaporation. Fuel, lubricants and oil shall be managed and stored in accordance with all Federal, State, Regional, and local laws and regulations. Used lubricants and used oil to be discarded shall be stored in marked corrosion-resistant containers and recycled or disposed in accordance with State, and local laws and regulations. There shall be no storage of fuel on the project site. Fuel must be brought to the project site each day that WORK is performed.
- D. **WASTE WATER**
 - 1. Disposal of waste water shall be as specified below.
 - a. Waste water from construction activities, such as on site material processing, clean-up, test water, etc. shall not be allowed to enter water ways or to be discharged prior to being treated to remove pollutants. The Contractor shall dispose of the construction related waste water in accordance with all requirements of Project Permits, Pitt County, and the City of Greenville.
 - b. Water generated from the flushing of lines after hydrostatic testing shall be emptied into the dewatering structure constructed by the Contractor as shown in the Project Plans, in accordance with the Project Permits and all Federal, State,

and Local laws and regulations. The Contractor shall discharge the water at a slow enough rate that allows it to fill the containment structure without damaging it or overflowing the straw/hay bale perimeter.

E. HISTORICAL, ARCHAEOLOGICAL, AND CULTURAL RESOURCES

1. Existing historical, archaeological, and cultural resources within the Contractor 's Work area will be shown on the construction drawings. The Contractor shall protect these resources and shall be responsible for their preservation during the life of the Contract. If during excavation or other construction activities any previously unidentified or unanticipated historical, archaeological, and cultural resources are discovered or found, all activities that may damage or alter such resources shall be temporarily suspended. Resources covered by this paragraph include but are not limited to: any human skeletal remains or burials; artifacts; shell, midden, bone, charcoal, or other deposits; rock or coral alignments, pavings, wall, or other constructed features; and any indication of agricultural or other human activities. Upon such discovery or find, the Contractor shall immediately notify Engineer so that the appropriate authorities may be notified and a determination made as to their significance and what, if any, special disposition of the finds should be made. The Contractor shall cease all activities that may result in impact to or the destruction of these resources. The Contractor shall secure the area and prevent employees or other persons from trespassing on, removing, or otherwise disturbing such resources.

F. BIOLOGICAL RESOURCES

1. The Contractor shall minimize interference with, disturbance to, and damage to fish, wildlife, and plants including their habitat. The Contractor shall be responsible for the protection of threatened and endangered animal and plant species including their habitat in accordance with Federal, State, Regional, and local laws and regulations.

G. POST CONSTRUCTION CLEANUP

1. The Contractor shall clean up all areas used for construction. The Contractor shall, unless otherwise instructed in writing by Engineer, obliterate all signs of temporary construction facilities such as haul roads, Work area, structures, foundations of temporary structures, stockpiles of excess or waste materials, and other vestiges of construction prior to final acceptance of the Work. The disturbed area shall be graded, filled and the entire area seeded unless otherwise indicated.

END OF SECTION 015100

SECTION 015200 – EROSION AND SEDIMENT CONTROL

PART 1 - GENERAL

1.1 Related Documents

- A. Drawings, more specifically Plan Sheets ES-1 through ES-5 for erosion and sediment control details, general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, Apply to this Section.
- B. SECTION 015100 – Environmental Protection
- C. SECTION 017419 – Construction Waste Management
- D. SECTION 329100 – ROW Restoration
- E. SECTION 329200 – Turf and Grasses

1.2 The Contractor shall implement the erosion and sediment control and prevention measures specified in the Plans and this section in a manner which will meet the requirements of Section 01500 Environmental Protection, and the requirements of the North Carolina Department of Environment and Natural Resources (NCDENR) Erosion and Sediment Control Permit.

1.3 Contractor must comply with the requirement of the Erosion and Sediment Control Plan, approved May12, 2015, and the requirements of NPDES General Stormwater Permit NCG010000 (Construction Activities). Approval also includes the following conditions:

- A. In the event of a conflict between the requirements of the Sedimentation Pollution Control Act, the submitted plan and/or the contract specifications, the more restrictive requirement shall prevail;
- B. The land disturbing activity shall be conducted in accordance with the approved erosion and sedimentation control plan;
- C. The latest approved erosion and sediment control plan will be used during periodic unannounced inspections to determine compliance and a copy of the plan must be on file at the job site. If it is determined that the implemented plan is inadequate, this office may require the installation of additional measures and/or that the plan be revised to comply with state law.
- D. All site revisions, including those required by other local, state or federal agencies, which affect site layout, drainage patterns, limits of disturbance and/or disturbed acreage must be submitted to this office for approval a minimum of 15 day prior implementing the revision;

- E. Revisions exceeding the approved scope of this project without this office's prior approval of the plan showing the changes can be considered a violation. Failure to comply with any part of the approved plan or with any requirements of this program could result in appropriate legal action (civil or criminal) against the financially responsible party. Legal actions could include Stop Work Orders, the assessing of a civil penalty of up to \$5000 for the initial violation and/or a civil penalty of up to \$5000 per day for each day the site is out of compliance;
- F. The Certificate of Plan Approval must be posted at the primary entrance to the job site and remain until the site is permanently stabilized;
- G. In cases of natural disaster related changes to the proposed land disturbing activity, all appropriate actions and adequate measure installations may be performed to prevent sediment damage, prior to submitting and receiving approval of the revised plan. A revised plan must be submitted for approval as soon as possible, but no later than 15 days after all emergency actions have been performed;
- H. Erosion and sediment control measures or devices are to be constructed and/or installed to safely withstand the runoff resulting from a 10 year storm event (25 year storm event in High Quality Zones). The 10 year storm event is generally equivalent to a storm producing 6.5 - 7 inches in 24 hours or at the rate of 6.5 - 7 inches in 1 hour, depending on the location of the project within the region;
- I. No earthen material is to be brought on or removed from the project site, until the off- site borrow and/or disposal sites are identified as part of the erosion control plan. If an off-site borrow and/or disposal site is to be utilized, submit the Permit name and identification number, prior to use;
- J. A buffer zone, sufficient to restrain visible sedimentation within the 25% of the width closest to the land disturbance, must be provided and maintained between the land- disturbing activity and any adjacent property or watercourse;
- K. In order to comply with the intent of the Act, the scheduling of the land-disturbing activities is to be such that both the area of exposure and the time between the land disturbance and the providing of a ground cover is minimized;
- L. Unless a temporary, manufactured, lining material has been specified, a clean straw mulch must be applied, at the minimum rate of 2 tons/acre, to all seeded areas. The mulch must cover at least 75% of the seeded area after it is either tacked, with an acceptable tacking material, or crimped in place;
- M. New or affected cut or filled slopes must be at an angle that can be retained by vegetative cover or other adequate erosion-control devices or structures appropriate, and must be provided with a ground cover sufficient to restrain erosion within 21 calendar days of completion of any phase (rough or final) of grading (Annual Rye Grass is not in the approved seeding specifications nor is it an acceptable substitute for the providing of a temporary ground cover);
- N. A permanent ground cover sufficient to restrain erosion, must be provided within the shorter of 15 working or 90 calendar days (if in a High Quality Zone, the shorter of 15 working or 60

calendar days) after completion of construction or development on II any portion of the tract (ANNUAL RYE GRASS IS NOT in the APPROVED seeding specifications NOR is it an ACCEPTABLE substitute for the providing of a nurse cover for the permanent grass cover); and

- O. All sediment and erosion control details for this project must conform to the standards as shown in the current Erosion & Sediment Control Planning and Design Manual; These details must be utilized for construction and are incorporated in the plan. The Design Manual may be found on-line at: <http://portal.ncdenr.org/web/lr/publications> .

1.4 The following shall be submitted in accordance with Section 013300 Submittal Procedures:

- A. SD-01 Preconstruction Submittals:
 - 1. Erosion and Sediment Control Inspection Report Form
- B. SD-07 Certificates
 - 1. Manufacturer's certificates, or specifications for materials proposed by the Contractor for use in erosion and sedimentation control on the Project. Certificates or specifications shall state that the materials meet the requirements of NCDENR for the purposes intended.

1.5 EROSION AND SEDIMENT CONTROLS

- A. The Contractor shall install and maintain the erosion and sediment controls as indicated in the Plans and these Specifications. The Contractor shall install all permanent erosion and sediment control measures such as seeding, mulching and tacking within 15 working days or 60 calendar days (whichever is shorter) following restoration of trenchline and workspace. Other measures such as silt fences, sediment traps, temporary diverters and other temporary measures shall be installed simultaneously with the land disturbing activity. Some measures will be required to be installed prior to land disturbing activities and are defined in the Plans. The Contractor is responsible for maintaining all erosion and sediment control measures during construction until Engineer and the Owner releases the Contractor from this phase of the project. The Owner will then assume the responsibility of maintaining permanent measures and removing temporary measures such as silt fences. The controls and measures required by the Contractor are described below.
- B. Stabilization Practices
 - 1. The stabilization practices to be implemented shall include temporary seeding, mulching, protection of trees, preservation of mature vegetation, etc.
- C. Structural Practices
 - 1. Structural practices shall be implemented to divert flows from exposed soils, temporarily store flows, or otherwise limit runoff and the discharge of pollutants from exposed areas of the site. Structural practices shall be implemented in a timely manner during the construction process to minimize erosion and sediment runoff. Structural practices including the location and details of installation and construction are shown on the Project Plans.

- D. Silt Fences
 - 1. The Contractor shall provide silt fences as a temporary structural practice to minimize erosion and sediment runoff. Silt fences shall be properly installed to effectively retain sediment immediately after completing each phase of WORK where erosion would occur in the form of sheet and rill erosion (e.g. clearing and grubbing, excavation, embankment, and grading). Silt fences shall be installed in the locations indicated on the drawings. Final removal of silt fence barriers shall be upon approval by Engineer.
- E. Refer to the Project Plans for specific details on erosion and sediment control measures, location, and sequencing. Erosion and sediment control details are included on Plan Sheets ES-1 through ES-5.
- F. Refer to the Project Plans for restoration details including seed, mulch, tack and fertilizer requirements.

PART 2 - PRODUCTS

2.1 MATERIALS FOR SILT FENCES

- A. The Contractor shall use material as indicated in the project plans.
 - 1. Certificate or Affidavit
 - a. A certificate or affidavit shall be provided attesting that the fabric and factory seams meet chemical, physical, and manufacturing requirements specified in the Project Plans. The Contractor shall submit a certificate or affidavit signed by a legally authorized official from the company manufacturing the filter fabric.
 - 2. Silt fences and erosion and sedimentation control materials shall be supplied by the Contractor.

2.2 MATERIALS FOR TEMPORARY CONSTRUCTION ENTRANCES

- A. Refer to the Project Plans for the locations and construction requirements of temporary construction entrances; and Specifications for the materials to be used.

PART 3 - EXECUTION

3.1 INSTALLATION OF SILT FENCES

- A. Silt fences shall be installed as shown on the Project Plans. Silt fences shall be removed upon approval by Engineer.

3.2 MAINTENANCE

- A. The Contractor shall maintain the temporary and permanent vegetation, erosion and sediment control measures, and other protective measures in good and effective operating condition by

performing routine inspections to determine condition and effectiveness, by restoration of destroyed vegetative cover, and by repair of erosion and sediment control measures and other protective measures. The following procedures shall be followed to maintain the protective measures.

1. Silt Fence Maintenance
 - a. Silt fences shall be inspected in accordance with paragraph 3.3, INSPECTIONS. Any required repairs shall be made promptly. Close attention shall be paid to the repair of damaged silt fence resulting from end runs and undercutting. Should the fabric on a silt fence decompose or become ineffective, and the barrier is still necessary, the fabric shall be replaced promptly. Sediment deposits shall be removed when deposits reach one-third of the height of the barrier. When a silt fence is no longer required, it shall be removed. The immediate area occupied by the fence and any sediment deposits shall be shaped to an acceptable grade. The areas disturbed by this shaping shall be seeded in accordance with the Specifications and Project Plans.
2. Stone Temporary Construction Entrances
 - a. As soon as practical after completion of restoration of the portion of the site being accessed via a temporary construction entrance, the entrances inclusive of all materials shall be removed.
 - b. Refer to SECTION 329100 – ROW Restoration for additional site restoration requirements and SECTION 329200 – Turf and Grasses for additional seeding and sodding Specifications.

3.3 INSPECTIONS

A. General

1. The Contractor shall inspect disturbed areas of the construction site, areas used for storage of materials that are exposed to precipitation that have not been finally stabilized, stabilization practices, structural practices, other controls, and area where vehicles exit the site at least once every seven (7) calendar days and within 24 hours of the end of any storm that produces 0.5 inches or more rainfall at the site. Sites with final stabilization shall be inspected at least once every month.

B. Inspections Details

1. Disturbed areas and areas used for material storage that are exposed to precipitation shall be inspected for evidence of, or the potential for, pollutants entering the drainage system. Erosion and sediment control measures identified in the Storm Water Pollution Prevention Plan shall be observed to ensure that they are operating correctly. Discharge locations or points shall be inspected to ascertain whether erosion control measures are effective in preventing significant impacts to receiving waters. Locations where vehicles exit the site shall be inspected for evidence of offsite sediment tracking.

C. Erosion and Sediment Control Inspection Reports

1. For each erosion and sediment control inspection conducted, the Contractor shall prepare an Erosion and Sediment Control Inspection Report summarizing the scope of the inspection, name(s) and qualifications of personnel making the inspection, the date(s) of the inspection, major observations relating to the implementation of the Storm Water Pollution Prevention Plan, maintenance performed, and actions taken. The

report shall be furnished to Engineer within 24 hours of the inspection. A copy of the inspection report shall be maintained on the job site.

END OF SECTION 015200

SECTION 017419 - CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for the following:
 - 1. Salvaging nonhazardous construction waste.
 - 2. Recycling nonhazardous construction waste.
 - 3. Disposing of nonhazardous construction waste.
- B. Related Requirements:
 - 1. Section 311000 – Clearing, for disposition of waste resulting from site clearing.

1.3 DEFINITIONS

- A. Construction Waste: Building and site improvement materials and other solid waste resulting from construction or repair operations. Construction waste includes packaging.
- B. Disposal: Removal off-site of construction waste and subsequent sale, recycling, reuse, or deposit in landfill or incinerator acceptable to authorities having jurisdiction.
- C. Recycle: Recovery of construction waste for subsequent processing in preparation for reuse.
- D. Salvage: Recovery of construction waste and subsequent sale or reuse in another facility.
- E. Salvage and Reuse: Recovery of demolition or construction waste and subsequent incorporation into the Work.

- 1.4 A. General: Practice efficient waste management in the use of materials in the course of the Work. Use all reasonable means to divert construction waste from landfills and incinerators. Facilitate recycling and salvage of materials.

1.5 QUALITY ASSURANCE

- A. Contractor shall appoint a person to ensure that construction waste is handled according to Contractor's waste management plan.

1.6 WASTE MANAGEMENT PLAN

- A. General: Develop a waste management plan identifying the type of waste that will be encountered during construction and how that waste will be handled. It may be handled by disposal, recycling, salvage, and/or salvage for reuse.

PART 2 - PRODUCTS – (Not Used)

PART 3 - EXECUTION

3.1 PLAN IMPLEMENTATION

- A. General: Implement waste management plan. Provide handling, containers, storage, signage, transportation, and other items as required to implement waste management plan during the entire duration of the Contract.

3.2 DISPOSAL OF WASTE

- A. General: Except for items or materials to be salvaged, recycled, or otherwise reused, remove waste materials from Project site and legally dispose of them in a landfill or incinerator acceptable to authorities having jurisdiction.
 - 1. Except as otherwise specified, do not allow waste materials that are to be disposed of accumulate on-site.
 - 2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
- B. Burning: Burning of waste materials is not permitted on the project site.
- C. Disposal: Remove waste debris from clearing and grubbing and dispose of off-site at areas approved for vegetation waste.

END OF SECTION 017419

SECTION 017839 - PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for project record documents, including the following:
 - 1. Record Drawings.
 - 2. Record Specifications.
 - 3. Record Product Data for materials not provided by Owner.
 - 4. X-ray record film and radiography inspection records.
 - 5. Pipeline test records.
 - 6. Regulator Station test records.
 - 7. Miscellaneous record submittals.
- B. Related Requirements:
 - 1. Section 019113 – General commissioning
 - 2. Section 019115 – Pipeline Cleaning, Testing, Drying, Tie-In, Purging, and Gas-Up
 - 3. Section 019120 – Regulator Station Cleaning, Testing, Tie-In, Purging, and Gas-Up
 - 4. Section 055101 – Natural Gas Pipeline Welding
 - 5. Section 055110 – Steel Natural Gas Pipeline Construction
 - 6. Section 055120 – Regulator Station Construction
 - 7. Section 264200 – Cathodic Protection
 - 8. Section 264210 – AC Mitigation
 - 9. Section 315010 – Horizontal Directional Drilling

1.3 CLOSEOUT SUBMITTALS

- A. Record Drawings: Comply with the following:
 - 1. Number of Copies: Submit copies of record Drawings as follows:
 - a. Final Submittal:
 - 1) Submit one (1) full size paper-copy set(s) of marked-up record prints for the GCP89-Northwestern Loop HP Gas Main Extension and for both district regulator stations.
 - 2) Submit PDF electronic files of scanned record prints.

- 3) Print each drawing sheet, whether or not changes and additional information were recorded.
- B. Miscellaneous Record Submittals: See other Related Requirements above referencing other Specification Sections for record-keeping requirements and submittals in connection with various construction, testing and commissioning activities. Submit one (1) paper copy and annotated PDF electronic files of each submittal.

PART 2 - PRODUCTS

2.1 RECORD DRAWINGS

- A. Record Prints: Maintain one set of marked-up paper copies of the Contract Drawings and Shop Drawings, incorporating new and revised drawings as modifications are issued.
1. Preparation: Mark record prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to provide information for preparation of corresponding marked-up record prints.
 - a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
 - b. Accurately record information in an acceptable drawing technique.
 - c. Record data as soon as possible after obtaining it.
 - d. Record and check the markup before enclosing concealed installations.
 - e. Cross-reference record prints to corresponding photographic documentation as applicable.
 2. Content: Types of items requiring marking include, but are not limited to, the following:
 - a. Dimensional changes to Drawings.
 - b. Revisions to details shown on Drawings.
 - c. Locations and depths of pipe installation and of underground utilities.
 - d. Revisions to routing of piping and conduits.
 - e. Revisions to electrical circuitry.
 - f. Actual equipment locations.
 - g. Changes made by Change Order or Work Change Directive.
 - h. Changes made following Engineer's written orders.
 - i. Details not on the original Contract Drawings.
 - j. Field records for variable and concealed conditions.
 3. Mark the Contract Drawings and Shop Drawings completely and accurately. Use personnel proficient at recording graphic information in production of marked-up record prints.
 4. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.

5. Mark important additional information that was either shown schematically or omitted from original Drawings.
 6. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.
- B. Record Digital Data Files: Immediately before inspection for Certificate of Substantial Completion, review marked-up record prints with Engineer and Construction Manager. When authorized, prepare a full set of corrected digital data files of the Contract Drawings, as follows:
1. Format: Annotated PDF electronic file.
 2. Refer instances of uncertainty to Engineer through Construction Manager for resolution.
 - a. See Section 013300 - Submittal Procedures for requirements related to use of Engineer's digital data files.
- C. Format: Identify and date each record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location.
1. Record Prints: Organize record prints and any newly prepared record Drawings into same order as the original drawing set. Bind the record drawing set. Include identification on cover sheets.
 2. Format: Annotated PDF electronic file.
 - a. Project name.
 - b. Date.
 - c. Designation "PROJECT RECORD DRAWINGS."
 - d. Name of Engineer and Construction Manager.
 - e. Name of Contractor.

2.2 RECORD SPECIFICATIONS

- A. Preparation: Mark Specifications to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and contract modifications.
1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
 2. Note related Change Orders, record Product Data, and record Drawings where applicable.
- B. Format: Submit record Specifications as scanned PDF electronic file(s) of marked-up paper copy of Specifications.

2.3 RECORD PRODUCT DATA

- A. Preparation: Mark Product Data to indicate the actual product installation where installation varies substantially from Construction Plans and Specifications.

1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
 2. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.
 3. Note related Change Orders, record Specifications, and record Drawings where applicable.
- B. Format: Submit record Product Data as scanned PDF electronic file(s) of marked-up paper copy of Product Data.

2.4 MISCELLANEOUS RECORD SUBMITTALS

- A. Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.
- B. Format: Submit miscellaneous record submittals as paper copy and/or scanned PDF electronic file(s) of marked-up miscellaneous record submittals.
1. Include miscellaneous record submittals directory organized by Specification Section number and title, electronically linked to each item of miscellaneous record submittals.

PART 3 - EXECUTION

3.1 RECORDING AND MAINTENANCE

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

END OF SECTION 017839

SECTION 019113 – GENERAL COMMISSIONING REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes general requirements that apply to implementation of commissioning without regard to specific systems, assemblies, or components.
- B. Related Requirements:
 - 1. Section 017839 - Project Record Documents
 - 2. Section 055101 - Natural Gas Pipeline Welding
 - 3. Section 019115 - Pipeline Cleaning, Testing, Drying, Tie-In, Purging and Gas-Up
 - 4. Section 055110 - Steel Natural Gas Pipeline Construction
 - 5. Section 264200 - Cathodic Protection
 - 6. Section 264210 - AC Mitigation
 - 7. Section 019120 - Regulator Station Cleaning, Testing, Tie-In, Purging, and Gas-Up

1.3 DEFINITIONS

- A. Commissioning Plan: A document that outlines the organization, schedule, allocation of resources, and documentation requirements of the commissioning process.
- B. Pipeline Commissioning: Performing all testing, dewatering, cleaning, drying, purging, and gas-up required to deliver an operating pipeline complete to the Owner packed with gas at the prescribed pressure. Includes commissioning of the impressed current cathodic protection system, and the AC mitigation system.
- C. District Regulator Station Commissioning: Performing all testing, cleaning, drying, electrification, SCADA interfacing, gas-up, set-up, and site work as required to deliver an operating regulator station to the Owner.

1.4 OWNER'S RESPONSIBILITIES

- A. Provide assistance with Owner's crews/personnel as needed during commissioning.
 - 1. ***Owner will make connections of conductors at RTU and program RTU at district regulator stations.***
- B. Approve Contractor's commissioning plan

- C. Operate all valves introducing gas into the new facilities from the existing system and downstream of the new facilities at the connection to the existing polyethylene distribution system.
- D. Witness commissioning procedure.
- E. Accept and take operation of the commissioned pipeline and regulator stations.

1.5 CONTRACTOR'S RESPONSIBILITIES

- A. Prepare a pipeline commissioning plan inclusive of:
 - 1. Staff responsibilities;
 - 2. Testing, Dewatering, Cleaning, Drying, Purging, Tie-In, and Gas-up;
 - 3. Commissioning records procedures; and
 - 4. Safety plan, including emergency procedures and contacts.
- B. Prepare a regulator station commissioning plan for each station inclusive of:
 - 1. Staff responsibilities;
 - 2. Cleaning, Testing, Tie-In, Purging, and Gas-up;
 - 3. Commissioning records procedures; and
 - 4. Safety plan, including emergency procedures and contacts.
- C. Notify Owner a minimum of 72 hours prior to conducting commissioning
- D. Contractor shall assign representatives with expertise and authority to act on its behalf and shall schedule them to participate in and perform commissioning process activities.
- E. Perform all testing of the pipeline and regulator station piping and equipment as required by these Specifications.
- F. Provide as-built record drawings
- G. Provide complete testing records
 - 1. Signed and certified by Contractor
 - 2. Signed as witnessed by Owner's representative, and or Engineer.

1.6 CONSTRUCTION ADMINISTRATION'S RESPONSIBILITIES

- A. Witness construction.
- B. Represent Owner in commissioning.
- C. Provide construction checklists and commissioning process test procedures.
- D. Conduct pre-commissioning meeting.
- E. Verify the execution of commissioning process activities.

- F. Witness systems, assemblies, equipment, and component startup.
- G. Compile test data, inspection reports, and certificates; include them in the commissioning process report.

PART 2 - PRODUCTS – (Not Used)

PART 3 - EXECUTION – (Not Used)

END OF SECTION 019113

SECTION 019115 – PIPELINE CLEANING, TESTING, DRYING, TIE-IN, PURGING AND GAS-UP

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. A. Section includes requirements that apply to cleaning, testing, drying, tying-in purging, gassing-up, and placing the gas main into service, or a service-ready condition.
- B. Related Requirements:
 - 1. Section 017839 - Project Record Documents
 - 2. Section 055110 - Steel Natural Gas Pipeline Construction
 - 3. Section 019120 - Regulator Station Cleaning, Testing, Tie-in, Purging, and Gas-up
- C. The pipeline shall be leak and strength tested by hydrostatic (water) testing. The purpose of the leak and strength test is to ensure the strength and integrity of the pipeline and to establish the maximum allowable operating pressure (MAOP). The Owner shall maintain the resulting test records on file for the life of the pipeline.
 - 1. Length as planned: 16,824 feet.
 - 2. Pipe Specification: API 5L GR-B, 6.625-inc OD, 0.280-inch wall thickness
- D. Short sections of pipe and fittings used to make connections and tie in the pipeline into the regulator station piping shall not be hydrotested. These sections shall have their weld joints 100% radiographically tested (x-ray).

PART 2 - PRODUCTS

2.1 MATERIALS

- A. The CONTRACTOR shall use material as indicated in the project plans.
- B. Test Water Source
 - 1. Test water is available from the fire hydrant at the north end of the pipeline located at the dead end of Riverview Road near the ROW of the NC Hwy 264 Bypass.
 - 2. Ten (10) days prior to the scheduled hydrostatic testing, Contractor shall contact the Greenville Utilities Commission Customer Service at 401 S. Greene Street, Greenville, NC, to arrange for a temporary hydrant water meter to be set at the hydrant.
- C. Test Water Disposal

1. The Contractor shall ensure that all federal, state, and local regulations are adhered to, to assure compliance with respect to usage and/or disposal of the water. In disposing of the water after testing, care should be taken to prevent damage to vegetation and excessive erosion or contamination of streams, rivers, or other waterbodies including groundwater.
2. A dewatering structure is included in the project plans. Contractor is responsible for acquiring approval from Engineer and all jurisdictional authorities should Contractor propose to use other means of disposal.

PART 3 - EXECUTION

3.1 SAFETY

- A. Work performed under this contract shall comply with OSHA requirements in 29 CFR 1910 and 29 CFR 1926, and state specific OSHA requirements where applicable. The Contractor shall develop and implement a Safety and Health Program (SHP) which incorporates requirements in OSHA standards 29 CFR 1910 and 29 CFR 1926.
- B. Suitable barricades, lights, applicable signs, flagmen, and watchmen shall be provided when required by the Engineer and/or the North Carolina Department of Transportation in all areas in which Work is performed. All safety related equipment specified herein shall be in full compliance with the minimum governing regulation subject to approval of the Engineer and shall be included in the Contract price.
- C. All pressure tests shall be conducted with due regard for the safety of people and property. During the pressure test appropriate precautions shall be taken to keep people not engaged in the testing operations clear of the testing area while the hydrostatic test is in progress.
- D. Only approved tools are to be used for test assemblies and plugs. Any tool or fitting that shows evidence of wear or damage that may affect its safe use shall be repaired or replaced.
- E. Take every reasonable precaution to protect employees and the public during testing.
- F. Construction in the immediate vicinity of the pipeline shall be discontinued during the period of the strength test and not commence until the pipeline has been blown-down to 100 psig or lower internal pressure.
- G. During pigging of the pipeline, the Contractor shall ensure that the exiting pigs are contained within the ditchline and that they cannot escape and cause damage to people or property.
- H. Before the hydrostatic test, notify and obtain the approval from responsible agencies (e.g., Department of Environment and Natural Resources, Water Resources Division and local agencies, etc.) and dispose of the water in accordance with applicable regulations and the project Plans and Permits.

- I. If possible, avoid the use of hoses for filling and de-watering. If hoses must be used, they shall be securely staked and chained to the ground. Hoses and connecting fittings used for the test shall be rated equal to, or above, the maximum hydrostatic test pressure.
- J. During purging operations it is important that all possible sources of ignition be eliminated. Open flames, sparks, heated materials, and materials that can ignite spontaneously in the presence of gas shall not be in the area of purging, especially the vent areas.
- K. Static electricity is one of the major concerns for purging operations and is one of the most difficult ignition hazards to control. Static electricity is often present during purging and it is more serious when the relative humidity is low. To eliminate static electricity during the purging operation the pipe and other equipment used in the purge operation shall be grounded. Before disconnecting pipes and equipment, a bond wire shall be attached to the pipe at two points to provide a connection across the proposed disconnection.

3.2 PRE-TEST MEETING

- A. The Contract shall notify the Engineer ten working days before beginning testing and cleaning operations. At least three days before the test, a pre-test meeting shall be held to define responsibilities, review the safety aspects, Contract procedures, and schedules for the test. Representatives from the Owner, Engineer and the Contractor shall attend the meeting.

3.3 PREPARATION

- A. With the exception of certain bellholes required for the installation and operation of testing equipment, each test segment shall be completely backfilled along its entire length prior to testing. Testing and inspection of the piping segment shall be conducted by the Contractor and witnessed by representatives of the Engineer. During the test, additional Contractor personnel should be available to make adjustments or repairs.
- B. Verify the pressure differentials due to elevation. The pressure gradient for water is 0.433 psi per foot of elevation in this location. Actual pipeline elevations may vary from what is shown in the project plans due to depth of installation, sag and over bends, and fitting pipe into the ditch. Contractor should take care to locate the highest and lowest points of the pipeline as installed and record their elevations.
- C. Pre-Test Actions
 - 1. The Contractor shall ensure that adequate communications equipment is available for the test.
 - 2. The Contractor shall ensure the accuracy of all pressure gauges being used in the test. Calibration records shall be available upon request.
 - 3. The Contractor shall have sufficient tools and personnel available to perform any necessary repairs.
 - 4. Before beginning the fill and test, the Contractor shall prepare a test plan. The test plan should include:
 - a. Piping segment to be filled and tested.
 - b. Fill sequence and monitoring plan.

- c. Estimated volume of line-fill for the test segment. (contractor's estimate)
- d. Desired test pressures.
- e. Shut-in sequence to isolate test segments (if required). When required, test segments shall not be isolated with valves, but by being separated from the system.
- f. Communication requirements.
- g. Designate the person to be in charge of the testing.
5. The Contractor shall ensure that all mainline valves in the piping segment to be tested are completely open.
6. The Contractor 's test plan shall be submitted to the Engineer for approval.
7. The Contractor shall schedule and conduct the pre-test meeting.

3.4 TESTING AND CLEANING

- A. The steel gas main shall be cleaned and pressure tested after installation. Testing shall meet the requirements of 49 CFR Part 192, Sub-part J, B31.8 and as otherwise specified herein.
- B. Test Pressure
 1. The following table sets the hydrostatic testing volume and pressure requirements according to the project plans. Contractor is responsible for verifying all parameters with actual installation conditions.

Hydrostatic Testing Volume and Pressure Parameters		
Length	16,824 feet	
Highest elevation	80 feet ASL	Pipe depth @ Gate #3
Lowest elevation	-13 fee BSL	Below Tar River
Desired MAOP	560 psig	
Required test pressure	840 psig	
Estimated pressure at fill point	815 psig	At pipe depth
Maximum allowable test pressure	840 psig	At fill point pipe depth
Water fill volume	25,288 gallons	
Approximate water for testing	25,348 gallons	
Approximate total water required	25,500 gallons	

- C. Test Duration
 1. Once the pipe test pressure is reached and it has stabilized, the pressure shall be maintained for eight (8) hours.
- D. Pipeline Filling for Testing
 1. The Contractor shall use a pump or pumps to fill the pipeline with water. Filling shall be continuous and follow directly behind one or more poly pigs to minimize the amount of air in the line. The pipeline shall be filled with a flow rate of approximately 200 GPM (a fill rate of 2.2 feet per second requiring approximately 3.39 hours to fill). The quantity of water pumped into the pipeline shall be monitored by metering the water, and by calculating the volume of line filled. The high elevation point vent valve assemblies shall be open when filling begins. Contractor personnel shall attend the vents. After the pig

passes the vent and a full stream of water with no trapped air exits the valve, the vent valve assemblies shall be closed. If necessary, a period of temperature stabilization between the ground and fill water should be provided.

2. The Contractor shall take a flow meter reading at the time the pig is launched and again as the pig is received at the end of the pipeline to get a reading of the line fill in the pipeline. After the pig has arrived in the receiver, the pump rate shall be slowed and the discharge pressure shall be gradually increased, in 50 psig increments or less, until the desired pressure is reached.

E. Test Procedure

1. The Contractor shall furnish accurate pressure and temperature gauges and a clock or strip type-recording instrument capable of recording an eight- (8) hour test. The Contractor shall also furnish a deadweight tester accurate to plus or minus 1-psig, to calibrate the pressure recorder. Accuracy and reliability of test instruments are the responsibility of the Contractor. The Contractor shall ensure that all gauges and instruments have been calibrated within 12 months of the test date. Calibrated back-up instruments are recommended.
2. For pressurizing the pipeline during the test, the Contractor shall use a pump with a capacity to provide a reasonable pressurizing rate. The pressure rating of the pump must be higher than the anticipated maximum test pressure. The Contractor shall develop a pressure-volume plot during pressurizing operations by recording pump strokes on an X-axis and pressure on a Y-axis. The Contractor shall use this plot to help ensure that the pipeline does not exceed 50% SMYS during testing.
3. The design pressure of the test heads and piping and the rated pressure of hoses and valves in the test manifold shall be no less than the anticipated test pressure. All equipment shall be inspected prior to the test to determine that it is in satisfactory condition.
4. Pressurization Sequence
 - a. At a uniform rate, raise the pressure in the pipeline to the required test pressure.
 - b. Monitor the pressure and check the pipeline for leakage. If any section of the pipeline shows leakage, the Contractor shall make any repairs or replacements required until a satisfactory leak test is obtained. After the leak is repaired, a new test period must be started at the test pressure.
 - c. When the test pressure is reached and stabilized from pressuring operations, a hold period shall commence. During this period, test medium may be added as required to maintain the minimum test pressure. The addition of small amounts of test medium due to temperature changes or small leakage around the test headers is normal. However, the requirement to add large or continuous amounts of test medium indicates leakage and should be investigated.
 - d. The length of the leak/strength test period shall be eight (8) hours. An eight-(8) or a twelve-(12) hour pressure-recording clock with a strip or clock chart shall be used to record the test. Pressure and temperature readings shall be recorded at fifteen-minute intervals for the first hour of the test and at 30-minute intervals thereafter. The pressures shall be verified from the dead weight tester. The pressure and temperature readings shall be recorded on a field pressure test report. The Contractor representative performing the test, the witnesses, and the inspector shall sign the test records. The records shall be delivered to the Engineer upon the successful completion of the pressure test.

- e. The Contractor is responsible for repairing any damage to the pipeline and the surrounding area resulting from the test and for retesting the pipeline until a satisfactory leak/strength test has been obtained.

F. Test Records

1. The Contractor shall provide the Leak/Strength Test Report to the Engineer after a successful test has been conducted. In addition to the Leak/Strength field pressure test report, a pressure-recording chart will be made to document the test and to validate the MAOP of the pipeline. The recording chart used should be appropriate for the test pressures and duration listed above. The recording pens shall be in good condition, cleaned and filled with sufficient ink to last the duration of the test. The chart shall be included in the Final Leak/Strength Test Report. Documentation on the chart shall include:
 - a. Exact time and pressure at the start and at the end of the test.
 - b. Job project number.
 - c. Test description and location.
 - d. Test date(s).
 - e. Environmental factors (temperature, raining, snowing, etc.).
 - f. Name of person entering the data.
 - g. Pipe sizes, grades, and wall thickness information.
 - h. Length of tested pipeline.
 - i. Test medium and duration.
 - j. Maximum and minimum test pressures.
 - k. Pressure at high and low elevations.
 - l. Name of Contractor and person responsible for the test.
 - m. Recording gauge number, range, and last calibration date.
 - n. The location of the recording gauge on the pipeline.

G. Dewatering

1. After testing the Contractor shall remove the water from the pipeline by draining the pipe using air compressors and pigs. The air compressors shall have sufficient capacity to remove the water at about the same rate as the filling rate. A valve shall be used to control the amount of water being discharged from the test segment.
2. Contractor shall utilize a dewatering structure as shown in the project Plans. If alternate means of dewatering are proposed, Contractor is responsible for obtaining all necessary permits and approvals.

H. Cleaning and Drying

1. After dewatering, the Contractor shall clean and dry the pipeline. For cleaning, the Contractor shall use a brush pig to displace a slug of water (at least 500 gallons) injected into the pipeline. After the brush pig, a second slug of water shall be injected followed by a poly pig for cleaning. Short slugs of water batched between two pigs are desired as long as there is enough water to keep the pigs apart and maintain a velocity of about three feet per second. This process will be repeated until the entire pipeline is cleaned to the Engineer's requirements and satisfaction. Air compressors shall be used to displace the pigs and water slugs.
2. After dewatering and cleaning, the Contractor shall dry the pipeline using clean super dry air. Soft foam pigs shall be pushed through the pipeline by the super dry air. The pigs

- are used to absorb any remaining free water in the cleaned pipeline. After the pipeline is dry, wire brush pigs shall be pushed through the pipeline to remove any water bearing debris from the pipe wall. After the wire brush pigs are pushed through the pipeline, soft foam pigs are again pushed through the pipe section to absorb the loosened debris.
3. After pipeline drying, dew-point readings shall be made to determine when the line has been dried sufficiently. The specific target dew point will be -35 degrees F.

3.5 PURGING AND GAS-UP

- A. Prior to beginning purging and gas-up operations, the Contractor shall complete the tie-in to the NC Hwy 43 District Regulator Station inlet piping and shall complete the tie-in to the Old River Road District Regulator Station inlet piping. The inlet riser and valve at each station shall be used as a vent stack during purging.
- B. The Contractor shall purge the natural gas steel pipeline of air with natural gas. The Owner (GREENVILLE UTILITIES COMMISSION) will provide the natural gas to purge and pack the pipeline. The air and natural gas shall be separated by a slug of nitrogen (inert gas). The purpose of the slug of nitrogen is to prevent the air and natural gas from meeting and mixing during the purge.
 1. Contractor shall provide a written purging plan to Owner and Engineer for approval prior to beginning purging.
 2. Pipeline will be considered purged of air and nitrogen when a consistent reading of 100% gas is obtained on a calibrated combustible gas detector.
- C. After the pipeline is successfully purged the pipeline will be packed with natural gas to the operational pressure.
- D. The pipeline will be purged and gassed-up from the Piedmont Gate No.3 to the north in two (2) stages.
 1. Stage one (1) begins at Gate No.3 and continues to the Old River Road Station at the northern end of the pipeline.
 - a. The valve at the supply line to the NC Hwy 43 District Regulator Station shall be closed during the stage one (1) purge and gas-up.
 2. Stage two (2) begins whenever the stage one (1) purge is completed.
 - a. Prior to beginning stage two (2), the mainline valve to the north of the NC Hwy 43 District Regulator Station supply line shall be closed.
 - b. The inlet riser valve at the Hwy 43 regulator station shall be closed.
 - c. The station supply valve at the Hwy 43 station will be opened.
 - d. The purge of this short section of main supplying the Hwy 43 station will be controlled at the station inlet riser valve and temporary vent stack.
- E. Detailed procedures for the purging operation shall be provided by the Contractor and approved by the Engineer. A general overview of purging procedures are as follows:
 1. Ensure that all the applicable parties have approved the purge and gas-up procedures.
 2. Ensure notification of all jurisdictional and safety agencies.
 3. Ensure that the required personnel are available and prepared.
 4. Ensure that the required purging and communication equipment is on hand.
 5. Isolate each pipeline segment to be purged by using the inline valves.

6. Open the valve at the vent stack in the end of the segment to be purged (Stage 1).
 7. Inject a slug of nitrogen into the pipeline at the beginning of the segment being purged followed by the natural gas, maintaining the required pressure on the gauge at the bypass fitting.
 8. Follow the progress of the purge by observing a gravitometer (or combustible gas indicator) at the vent. Specific gravities will decrease from air to nitrogen to gas.
 9. Stop the injection of the gas and close the vent stack valve when the indicator at the vent indicates 100% natural gas.
 10. Isolate the section of pipeline to the north of the Hwy 43 Regulator Station by closing the mainline valve.
 11. Purge the short section of main feeding the Hwy 43 Regulator Station through the open supply valve and control the purge with the station inlet riser valve.
 12. Remove the purge fittings, hoses, etc., and plug the injection fittings.
 13. Open the mainline valve north of the Hwy 43 Regulator Station and pack the pipeline segment to the desire pressure.
 14. Observe the pipeline segment pressure and check the segment for leaks.
- F. Following completion of gas up a Purging, Pipeline Cleaning, Drying, and Gas-Up Report shall be provided to the Engineer.
- G. Safety
1. The purging and gas-up operations shall be performed in accordance with Title 29 of the Code of Federal Regulations, Chapter I (29 CFR 1926), "Occupational Safety and Health Standards for the Construction Industry"; and any other applicable standards.

END OF SECTION 019115

SECTION 019115 – REGULATOR STATION CLEANING, TESTING, TIE-IN, PURGING, AND GAS-UP

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes requirements that apply to cleaning, testing, tying-in purging, gassing-up, and placing the two (2) district regulator stations into service, or a service-ready condition.
- B. Related Requirements:
 - 1. Section 017839 - Project Record Documents
 - 2. Section 055120 - Regulator Station Construction
 - 3. Section 019115 - Pipeline Cleaning, Testing, Drying, Tie-in, Purging, and Gas-up
- C. Each facility shall be pressure tested as specified in these procedures. The contractor shall provide the necessary materials, fittings, flanges, spool pieces, appurtenances, labor and pumps required to pressurize each facility in a satisfactory and efficient manner. All pressure testing shall be done in the presence of the GUC. Tests done without supervision will not be accepted and the contractor shall be required to retest at his expense.
- D. The Contractor will be required to test each facility in its entirety, without the meters, regulators or control valves within the piping runs. The inlet and outlet piping will be capped at their future connection points. Each facility shall be pressure tested using compressed air or nitrogen. Water shall not be used as a test medium for the testing of these facilities. The method and procedure for each pressure test shall be subject to the approval of the Engineer. Natural gas shall not be admitted into any facility prior to the GUC's approval and the successful completion of all required pressure tests.
- E. The Regulator Stations shall be leak and strength tested by pneumatic (air or inert gas) testing. The purpose of the leak and strength test is to ensure the strength and integrity of the station piping and to establish the maximum allowable operating pressure (MAOP) of the facilities. The Owner shall maintain the resulting test records on file for the life of the stations.
 - 1. Pipe Specification: API 5L GR-B, 6.625-inc OD, 0.280-inch wall thickness
- F. Short sections of pipe and fittings used to make connections and tie in the pipeline into the regulator station pipeline shall not be pressure tested. These sections shall have their weld joints 100% radiographically (x-ray) tested.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. The Contractor shall use material as indicated in the project plans.
- B. Test Medium
 - 1. Clean compressed air or nitrogen shall be used to test the regulator stations.
- C. Miscellaneous, valves, fittings, gauges and materials
 - 1. The Contractor shall supply all materials required for completing the testing.

PART 3 - EXECUTION

3.1 SAFETY

- A. Contractor shall notify Engineer five (5) working days prior to beginning pressure testing of a regulator station.
- B. 24 hours prior to conducting a regulator station pressure test, Contractor shall hold a planning meeting with the Engineer and all parties that will participate in the testing.
- C. All pressure tests shall be conducted with due regard for the safety of people and property. During the pressure test appropriate precautions shall be taken to keep people not engaged in the testing operations clear of the testing area while the pneumatic test is in progress.
- D. Only approved tools are to be used for test assemblies and plugs. Any tool or fitting that shows evidence of wear or damage that may affect its safe use shall be repaired or replaced.
- E. Take every reasonable precaution to protect employees and the public during testing.
- F. Construction in the immediate vicinity of the regulator station being tested shall be discontinued during the period of the strength test and not commence until the station has been blown-down to 100 psig or lower internal pressure.
- G. Hoses and connecting fittings used for the test shall be rated equal to, or above, the maximum pneumatic test pressure.
- H. During purging operations it is important that all possible sources of ignition be eliminated. Open flames, sparks, heated materials, and materials that can ignite spontaneously in the presence of gas shall not be in the area of purging, especially the vent areas.
- I. Static electricity is one of the major concerns for purging operations and is one of the most difficult ignition hazards to control. Static electricity is often present during purging and it is more serious when the relative humidity is low. To eliminate static electricity during the purging operation the pipe and other equipment used in the purge operation shall be

grounded. Before disconnecting pipes and equipment, a bond wire shall be attached to the pipe at two points to provide a connection across the proposed disconnection.

3.2 PRE-TEST MEETING

- A. The Contractor shall notify the Engineer five (5) working days before beginning testing and cleaning operations. At least 24 hours before the test, a pre-test meeting shall be held to define responsibilities, review the safety aspects, Contractor procedures, and schedules for the test. Representatives from the Owner, Engineer and the Contractor shall attend the meeting.

3.3 PREPARATION

- A. Forty-eight (48) hours prior to commencing any testing operations, the contractor shall submit a test schedule to the GUC for approval.
- B. Pre-Test Actions
 - 1. The Contractor shall ensure that adequate communications equipment is available for the test.
 - 2. The Contractor shall ensure the accuracy of all pressure gauges being used in the test. Calibration records shall be available upon request.
 - 3. The Contractor shall have sufficient tools and personnel available to perform any necessary repairs.
 - 4. Before beginning the fill and test, the Contractor shall prepare a test plan. The test plan should include:
 - a. Regulator Station piping to be filled and tested.
 - b. Fill sequence and monitoring plan.
 - c. Estimated of time required to increase pressure to required test pressure based on equipment and method of pressurizing. (contractor's estimate)
 - d. Desired test pressures.
 - e. Shut-in sequence. Test segments shall not be isolated with valves.
 - f. Communication requirements.
 - g. Designate the person to be in charge of the testing.
 - 5. The Contractor shall ensure that all regulator station piping is separated and isolated from upstream and downstream piping.
 - 6. The Contractor's test plan shall be submitted to the Engineer for approval.
 - 7. The Contractor shall schedule and conduct the pre-test meeting.

3.4 TESTING AND CLEANING

- A. Prior to testing, each facility shall be thoroughly cleaned to remove all foreign matter which may have been trapped inside the pipe during construction. The contractor shall provide the required equipment to clean the facility of all debris. The facility shall be tested as soon as possible following satisfactory cleaning.

B. Test Pressure

1. The following table sets the pneumatic testing pressure requirements. Contractor is responsible for verifying all parameters with actual installation conditions.

Pneumatic Testing Pressure Parameters	
Desired MAOP	560 psig
Required test pressure	840 psig
Maximum allowable test pressure	850 psig
Minimum Test Duration	Not less than 4 hours

C. Test Duration

1. Once the pipe test pressure is reached and it has stabilized, the pressure shall be maintained for four (4) hours.

D. Test Procedure

1. The Contractor shall furnish accurate pressure and temperature gauges and a clock or strip type-recording instrument capable of recording a 4-hour test. The Contractor shall also furnish a deadweight tester accurate to plus or minus 1-psig, to calibrate the pressure recorder. Accuracy and reliability of test instruments are the responsibility of the Contractor. The Contractor shall ensure that all gauges and instruments have been calibrated within 12 months of the test date. Calibrated back-up instruments are recommended. The contractor shall provide evidence of recent and accurate calibration of all chart-recording instruments.
2. The design pressure of the test heads and piping and the rated pressure of hoses and valves in the test manifold shall be no less than the anticipated test pressure. All equipment shall be inspected prior to the test to determine that it is in satisfactory condition.
3. Pressurization Sequence
 - a. Record the ambient pressure and temperature at the beginning and end of the testing and each time the pressure is recorded during the testing.
 - b. At a uniform rate, raise the pressure in the pipeline to the required test pressure.
 - c. Monitor the pressure and check the station piping for leakage. If any section of the piping shows leakage, the Contractor shall make any repairs or replacements required until a satisfactory leak test is obtained. After any leaks are repaired, a new test period must be started at the test pressure.
 - d. When the test pressure is reached and stabilized from pressuring operations, a hold period shall commence.
 - e. The length of the leak/strength test period shall be four (4) hours. An eight-(8) hour pressure-recording clock with a strip or clock chart shall be used to record the test. Pressure and temperature readings shall be recorded at fifteen-minute intervals for the first hour of the test and at 30-minute intervals thereafter.
 - f. The pressures shall be verified from the dead weight tester.
 - g. The date and time of the commencement and completion of the pressure test shall be recorded on the pressure chart. The pressure and temperature readings shall be recorded on a GUC test record form. The Contractor representative performing the test, the witnesses, and the inspector shall sign the test records and the test pressure recording chart. The original test chart shall be submitted

to the Engineer along with an Owner (GUC) test record form. The records shall be delivered to the Engineer upon the successful completion of the pressure test.

- h. The Contractor is responsible for repairing any damage to the station piping and the surrounding area, and repairing any leaks resulting from the test and for retesting the regulator station until a satisfactory leak/strength test has been obtained.

E. Test Records

- 1. The Contractor shall provide the Leak/Strength Test Report to the ENGINEER after a successful test has been conducted. In addition to the Leak/Strength field pressure test report, a pressure-recording chart will be made to document the test and to validate the MAOP of the regulator station. The recording chart used should be appropriate for the test pressures and duration listed above. The recording pens shall be in good condition, cleaned and filled with sufficient ink to last the duration of the test. The chart shall be included in the Final Leak/Strength Test Report. Documentation on the chart shall include:
 - a. Exact date, time, pressure, and temperature at the start and at the end of the test.
 - b. Job project number.
 - c. Test description and location.
 - d. Environmental factors (temperature, raining, snowing, etc.).
 - e. Name of person entering the data.
 - f. Pipe sizes, grades, and wall thickness information.
 - g. Test medium and duration.
 - h. Maximum and minimum test pressures.
 - i. Name of Contractor and person responsible for the test.
 - j. Recording gauge number, range, and last calibration date.
 - k. The location of the recording gauge on the regulator station piping.

3.5 TIE-IN CONNECTION PREPARATION

- A. Upon the successful completion of the pressure test and the facility has been cleaned and approved in every respect to the satisfaction of the Owner and Engineer, the contractor shall remove blind caps and spool pieces used for testing and install the meters, regulators and control valves.
- B. The contractor will not be responsible for operating valves in the distribution system to admit of natural gas into the facilities.

3.6 TIE-IN CONNECTIONS

- A. It is the responsibility of the contractor to connect the work to inlet and outlet piping as shown on the Plans. The contractor shall install the appropriate spool pieces, elbows, tees, transition fittings, and valves in accordance with the drawings to complete the tie-in.
- B. Under no circumstances shall the contractor operate any valves within the GUC system. GUC personnel shall perform all valve operations as required to administer gas into each facility.

- C. Five days prior to the scheduled tie-in of each regulator station, the Contractor shall provide a written start-up and commissioning plan for each regulator station for the Owner and Engineer to approve. The Contractor shall be required to perform all activities required to startup and commission the meter and regulator stations, except operating existing system valves to introduce gas into the stations.

3.7 PURGING AND GAS-UP

- A. Contractor shall provide a written purging plan for each station 24 hours prior to beginning purging operations for Owner and Engineer approval.
- B. Prior to beginning purging and gas-up operations, the Contractor shall complete the tie-in to the inlet riser and valve at each station that is to be used as a vent stack during purging of the Northwestern Loop High Pressure Gas Main Extension.
- C. The Contractor shall purge the regulator station piping of air with natural gas. The GUC will provide the natural gas to purge and pack the regulator station.
- D. Regulator stations will be considered purged of air or nitrogen when a consistent reading of 100% gas is obtained on a calibrated combustible gas detector.
- E. After the regulator station is successfully purged the station will be packed with natural gas to the operational pressure.

3.8 COMMISSIONING

- A. Contractor shall ensure that all station mechanical components function as designed and intended inclusive of valves, regulators, pilots, and meters as part of the commissioning procedure.
- B. After the facilities have been placed into service, sensing line connections and equipment, connections not included in the pressure test, shall be leak tested with a foam leak solution to detect leaks. If leaks or defects at the connection points or within the equipment are discovered during the tests; they shall be repaired or replaced, and re-tested by the contractor, at the contractor's expense, as directed by the Engineer.

END OF SECTION 019120

SECTION 033000 - CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes cast-in-place concrete, including formwork, reinforcement, concrete materials, mixture design, placement procedures, and finishes, for the following:
 - 1. Pipe support foundations.
 - 2. Fence post foundations.
- B. Related Sections:
 - 1. Section 055120 – Regulator Station Construction
 - 2. Section 323113 – Chain Link Fences and Gates

1.3 DEFINITIONS

- A. Cementitious Materials: Portland cement alone or in combination with one or more of the following: blended hydraulic cement, fly ash and other pozzolans, ground granulated blast-furnace slag, and silica fume; subject to compliance with requirements.

1.4 ACTION SUBMITTALS

- A. Design Mixtures: For each concrete mixture. Submit alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.
- B. Formwork Shop Drawings

1.5 INFORMATIONAL SUBMITTALS

- A. Material Certificates: For each of the following, signed by manufacturers:
 - 1. Cementitious materials.
 - 2. Admixtures.
 - 3. Curing compounds.

- B. Field quality-control reports.

1.6 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment.
 - 1. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities."
- B. Welding Qualifications: Qualify procedures and personnel according to AWS D1.4/D 1.4M, "Structural Welding Code - Reinforcing Steel" as applicable.
- C. ACI Publications: Comply with the following unless modified by requirements in the Contract Documents:
 - 1. ACI 301, "Specifications for Structural Concrete," Sections 1 through 5.
 - 2. ACI 117, "Specifications for Tolerances for Concrete Construction and Materials."

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Steel Reinforcement: Deliver, store, and handle steel reinforcement to prevent bending and damage. Avoid damaging coatings on steel reinforcement.

PART 2 - PRODUCTS

- 2.1 NCDOT approved for intended use.

2.2 FORM-FACING MATERIALS

- A. Smooth-Formed Finished Concrete: Form-facing panels that will provide continuous, true, and smooth concrete surfaces. Furnish in largest practicable sizes to minimize number of joints.
 - 1. Plywood, metal, or other approved panel materials.
- B. Forms for Cylindrical Columns, Pedestals, and Supports: Metal, glass-fiber-reinforced plastic, paper, or fiber tubes that will produce surfaces with gradual or abrupt irregularities not exceeding specified formwork surface class. Provide units with sufficient wall thickness to resist plastic concrete loads without detrimental deformation.
- C. Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.

- D. Form Ties: Factory-fabricated, removable or snap-off metal or glass-fiber-reinforced plastic form ties designed to resist lateral pressure of fresh concrete on forms and to prevent spalling of concrete on removal.
 - 1. Furnish units that will leave no corrodible metal closer than 1 inch (25 mm) to the plane of exposed concrete surface.
 - 2. Furnish ties that, when removed, will leave holes no larger than 1 inch (25 mm) in diameter in concrete surface.

2.3 STEEL REINFORCEMENT

- A. Galvanized Reinforcing Bars: ASTM A 706/A 706M, deformed bars, ASTM A 767/A 767M, Class II zinc coated after fabrication and bending.
- B. Epoxy-Coated Reinforcing Bars: ASTM A 706/A 706M, deformed bars, ASTM A 775/A 775M or ASTM A 934/A 934M, epoxy coated, with less than 2 percent damaged coating in each 12-inch (300-mm) bar length.
- C. Plain-Steel Wire: ASTM A 82/A 82M, galvanized.
- D. Galvanized-Steel Welded Wire Reinforcement: ASTM A 185/A 185M, plain, fabricated from galvanized-steel wire into flat sheets.
- E. Epoxy-Coated Welded Wire Reinforcement: ASTM A 884/A 884M, Class A coated, Type 1, plain steel.

2.4 REINFORCEMENT ACCESSORIES

- A. Epoxy-Coated Joint Dowel Bars: ASTM A 775/A 775M epoxy coated.
- B. Epoxy Repair Coating: Liquid, two-part, epoxy repair coating; compatible with epoxy coating on reinforcement and complying with ASTM A 775/A 775M.
- C. Zinc Repair Material: ASTM A 780, zinc-based solder, paint containing zinc dust, or sprayed zinc.
- D. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire reinforcement in place. Manufacture bar supports from steel wire, plastic, or precast concrete according to CRSI's "Manual of Standard Practice," of greater compressive strength than concrete and as follows:
 - 1. For epoxy-coated reinforcement, use epoxy-coated or other dielectric-polymer-coated wire bar supports.
 - 2. For zinc-coated reinforcement, use galvanized wire or dielectric-polymer-coated wire bar supports.

2.5 CONCRETE MATERIALS

- A. Cementitious Material: Use the following cementitious materials, of the same type, brand, and source, throughout Project:
 - 1. Portland Cement: NCDOT approved for structural applications
 - a. Fly Ash: ASTM C 618, Class F or C.
- B. Water: ASTM C 94/C 94M and potable.

2.6 ADMIXTURES

- A. Air-Entraining Admixture: ASTM C 260.
- B. Chemical Admixtures: Provide admixtures certified by manufacturer to be compatible with other admixtures and that will not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride.
 - 1. Water-Reducing Admixture: ASTM C 494/C 494M, Type A.
 - 2. Retarding Admixture: ASTM C 494/C 494M, Type B.
 - 3. Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type D.
 - 4. High-Range, Water-Reducing Admixture: ASTM C 494/C 494M, Type F.
 - 5. High-Range, Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type G.
 - 6. Plasticizing and Retarding Admixture: ASTM C 1017/C 1017M, Type II.
- C. Set-Accelerating Corrosion-Inhibiting Admixture: Commercially formulated, anodic inhibitor or mixed cathodic and anodic inhibitor; capable of forming a protective barrier and minimizing chloride reactions with steel reinforcement in concrete and complying with ASTM C 494/C 494M, Type C.
- D. Non-Set-Accelerating Corrosion-Inhibiting Admixture: Commercially formulated, non-set-accelerating, anodic inhibitor or mixed cathodic and anodic inhibitor; capable of forming a protective barrier and minimizing chloride reactions with steel reinforcement in concrete.
- E. Granular Fill: Clean mixture of crushed stone or crushed or uncrushed gravel; ASTM D 448, Size 57, with 100 percent passing a 1-1/2-inch (37.5-mm) sieve and 0 to 5 percent passing a No. 8 (2.36-mm) sieve.
- F. Fine-Graded Granular Material: Clean mixture of crushed stone, crushed gravel, and manufactured or natural sand; ASTM D 448, Size 10, with 100 percent passing a 3/8-inch (9.5-mm) sieve, 10 to 30 percent passing a No. 100 (0.15-mm) sieve, and at least 5 percent passing No. 200 (0.075-mm) sieve; complying with deleterious substance limits of ASTM C 33 for fine aggregates.
- G. Water: Potable.

2.7 CONCRETE MIXTURES, GENERAL

- A. Prepare design mixtures for each type and strength of concrete, proportioned on the basis of laboratory trial mixture or field test data, or both, according to ACI 301.
 - 1. Mixture shall be NCDOT approved for comparable installation.
 - 2. CONTRACTOR to provide mixture information prior to installation.
- B. Admixtures: Use admixtures according to manufacturer's written instructions.

2.8 CONCRETE MIXTURES FOR BUILDING ELEMENTS

- A. Footings and small foundations: Proportion normal-weight concrete mixture as follows:
 - 1. Minimum Compressive Strength: 4000 psi (27.6 MPa) at 28 days.

2.9 FABRICATING REINFORCEMENT

- A. Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice."

2.10 CONCRETE MIXING

- A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94/C 94M, and furnish batch ticket information.
- B. Project-Site Mixing: Measure, batch, and mix concrete materials and concrete according to ASTM C 94/C 94M. Mix concrete materials in appropriate drum-type batch machine mixer.
 - 1. For mixer capacity of 1 cu. yd. (0.76 cu. m) or smaller, continue mixing at least 1-1/2 minutes, but not more than 5 minutes after ingredients are in mixer, before any part of batch is released.
 - 2. For mixer capacity larger than 1 cu. yd. (0.76 cu. m), increase mixing time by 15 seconds for each additional 1 cu. yd. (0.76 cu. m).
 - 3. Provide batch ticket for each batch discharged and used in the Work, indicating Project identification name and number, date, mixture type, mixture time, quantity, and amount of water added. Record approximate location of final deposit in structure.

PART 3 - EXECUTION

3.1 FORMWORK

- A. Design, erect, shore, brace, and maintain formwork, according to ACI 301, to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until structure can support such loads.

- B. Construct formwork so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117.
- C. Limit concrete surface irregularities, designated by ACI 347 as abrupt or gradual, as follows:
 - 1. Class B, 1/4 inch (6 mm) for rough-formed finished surfaces.
- D. Construct forms tight enough to prevent loss of concrete mortar.
- E. Fabricate forms for easy removal without hammering or prying against concrete surfaces. Provide crush or wrecking plates where stripping may damage cast concrete surfaces. Provide top forms for inclined surfaces steeper than 1.5 horizontal to 1 vertical.
 - 1. Install keyways, reglets, recesses, and the like, for easy removal.
 - 2. Do not use rust-stained steel form-facing material.
- F. Do not chamfer exterior corners and edges of permanently exposed concrete.
- G. Clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, and other debris just before placing concrete.
- H. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.
- I. Coat contact surfaces of forms with form-release agent, according to manufacturer's written instructions, before placing reinforcement.

3.2 EMBEDDED ITEMS

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

3.3 REMOVING AND FORMS

- A. General: Formwork for sides of beams, walls, columns, and similar parts of the Work that does not support weight of concrete may be removed after cumulatively curing at not less than 50 deg F (10 deg C) for 24 hours after placing concrete. Concrete has to be hard enough to not be damaged by form-removal operations and curing and protection operations need to be maintained.

3.4 STEEL REINFORCEMENT

- A. General: Comply with CRSI's "Manual of Standard Practice" for placing reinforcement.
- B. Clean reinforcement of loose rust and mill scale, earth, ice, and other foreign materials that would reduce bond to concrete.

- C. Accurately position, support, and secure reinforcement against displacement. Locate and support reinforcement with bar supports to maintain minimum concrete cover. Do not tack weld crossing reinforcing bars.

- 1. Weld reinforcing bars according to AWS D1.4/D 1.4M, where indicated.

- D. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.

3.5 CONCRETE PLACEMENT

- A. Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections have been performed.
- B. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete will be placed on concrete that has hardened enough to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as indicated. Deposit concrete to avoid segregation.
- C. Hot-Weather Placement: Comply with ACI 301 and as follows:
 - 1. Maintain concrete temperature below 90 deg F (32 deg C) at time of placement.

3.6 FINISHING FORMED SURFACES

- A. Rough-Formed Finish: As-cast concrete texture imparted by form-facing material with tie holes and defects repaired and patched. Remove fins and other projections that exceed specified limits on formed-surface irregularities.
 - 1. Apply to concrete surfaces not exposed to public view.
- B. Broom Finish: Apply a broom finish to exterior concrete platforms, steps, ramps, and elsewhere as indicated.

3.7 MISCELLANEOUS CONCRETE ITEMS

- A. Equipment Bases and Foundations:
 - 1. Coordinate sizes and locations of concrete bases with actual equipment provided.
 - 2. Construct according to the Project Plans.
 - 3. Minimum Compressive Strength: 4000 psi (27.6 MPa) at 28 days.
 - 4. Prior to pouring concrete, place and secure anchorage devices. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
 - 5. Cast anchor-bolt insert into bases. Install anchor bolts to elevations required for proper attachment to supported equipment.

3.8 CONCRETE PROTECTING AND CURING

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and ACI 301 for hot-weather protection during curing.
- B. Cure concrete according to ACI 308.1, by one or a combination of the following methods:
 - 1. Moisture Curing: Keep surfaces continuously moist for not less than seven days with the following materials:
 - a. Absorptive cover, water saturated, and kept continuously wet.

3.9 FIELD QUALITY CONTROL

- A. Mix reports
- B. Manufacturer's recommendations
- C. Inspector's examination and records.
- D. Inspections:
 - 1. Steel reinforcement placement.
 - 2. Steel reinforcement welding.
 - 3. Headed bolts and studs.
 - 4. Verification of use of required design mixture.
 - 5. Concrete placement, including conveying and depositing.
 - 6. Curing procedures and maintenance of curing temperature.

END OF SECTION 033000

SECTION 055101 – NATURAL GAS PIPELINE WELDING

PART 1 - GENERAL

1.1 REFERENCES

- A. 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. ASME International (ASME)
 - a. B31.8 (2014) - Gas Transmission and Distribution Piping Systems
 - 2. American Petroleum Institute (API)
 - a. API Standard 1104 – Welding of Pipelines and Related Facilities (21st edition)

1.2 RELATED DOCUMENTS

- A. Section 055110 – Natural Gas Pipeline Construction
- B. Section 055120 – Regulator Station Construction

1.3 SUBMITTALS

- A. The following shall be submitted in accordance with Section 013300:
 - 1. SD-03 Product Data
 - a. Manufacturer's data shall be submitted for the following items:
 - 1) Welding consumable materials
 - 2. SD-07 Certificates
 - a. Welder qualifications
 - b. Welder and welding operator performance qualification certificates
 - c. Welding Procedure Specification and Qualification

1.4 GENERAL REQUIREMENTS

- A. This section covers the welding of the natural gas pipeline. Deviations from applicable codes, approved procedures, and approved detail drawings will not be permitted without prior written approval from the Engineer. Materials or components with welds made offsite will not be accepted if the welding does not conform to the requirements of this Specification, unless otherwise specified.
- B. This section also covers welding of the regulator station piping.
- C. Procedures shall be developed by the Contractor for welding all metals included in the WORK. Welding shall not be started until welding procedures, welders, and welding operators have been qualified. The Contractor shall provide Engineer their Welding Procedure Specification and Qualification. Qualification testing shall be performed by the Contractor if approved by Engineer. Costs of such testing shall be borne by the Contractor. Engineer shall be notified at

least 24 hours in advance of the time and place of the tests. When practicable, the qualification tests shall be performed at or near the worksite.

- D. The Contractor shall maintain current records of the test results obtained in the welding procedure, and welding operator and welder performance qualifications readily available at the site for examination by Engineer.
- E. The procedures for making transition welds between different materials or between plates or pipes of different wall thicknesses shall be qualified.
- F. ASME B31.8 requirements for branch connections may be used in lieu of detailed designs. Unless otherwise specified, the choice of welding process shall be the responsibility of the Contractor.

1.5 PERFORMANCE

- A. The Contractor shall be responsible for the quality of all joint preparation and welding. All materials used in the welding operations shall be clearly identified and recorded. The inspection and testing defined in this Specification are minimum requirements. Additional inspection and testing shall be the responsibility of the Contractor when he deems it necessary to achieve the quality required.
- B. The Contractor shall provide Engineer with Contractor's:
 - 1. Welding Operations that contain detailed procedures which define methods of compliance to the contract drawings and specifications.

1.6 WELDER QUALIFICATIONS

- A. The Contractor shall provide ENGINEER their welder and welding operator performance qualifications certificates. Welding procedures, welders, and welding operators previously qualified by test may be accepted for the WORK without requalification, provided that all of the following conditions are fulfilled:
 - 1. Copies of the welding procedures, the procedure qualification test records, and the welder and welding operator performance qualification test records are submitted and approved in accordance with paragraph SUBMITTALS.
 - 2. Testing was performed in accordance with API 1104.
- B. Certification
 - 1. Before assigning welders or welding operators to the Work, the Contractor shall provide Engineer with their names together with certification that each individual is performance-qualified as specified. The certification shall state the type of welding and positions for which each is qualified, the code and procedure under which each is qualified, date qualified, and the firm and individual certifying the qualification tests.
- C. Identification
 - 1. Each particular weld shall be identified with the personal number, letter, or symbol assigned to each welder or welding operator. To identify welds, written records

indicating the location of welds made by each welder or welding operator shall be submitted, and each welder or welding operator shall apply the personal mark adjacent to the welds on pipe coating using a rubber stamp or felt-tipped marker with permanent, weatherproof ink or other methods approved by the Engineer that do not deform the metal. For seam welds, identification marks shall be placed adjacent to the welds at 3 foot intervals. Identification by die stamps or electric etchers will not be allowed.

D. Renewal of Qualification

1. Requalification of a welder or welding operator shall be required under any of the following conditions:
 - a. When a welder or welding operator has not used the specific welding process for a period of 6 months.
 - b. When a welder or welding operator has not welded with any process during a period of 3 months, all the personal qualifications shall be considered expired, including any extended by virtue of a., above.
 - c. There is specific reason to question the person's ability to make welds that will meet the requirements of the specifications.
 - d. The welder or welding operator was qualified by an employer, other than those firms performing WORK under this contract, and a qualification test has not been taken within the preceding 12 months.
 - e. Renewal of qualification for a specific welding process under conditions a., b., and d., above, needs to be made on only a single test joint or pipe of any thickness, position, or material to reestablish the welder's or welding operator's qualification for any thickness, position, or material covered under previous qualification.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 PROCEDURE

- A. All steel pipe and/or fittings, connections and other fabrications within the Work shall be welded, unless otherwise specified or directed by Engineer. All welding shall be performed in accordance with the requirements of API 1104.
- B. Welding shall be performed in accordance with qualified procedures using qualified welders and welding operators. Welding shall not be done when the quality of the completed weld could be impaired by the prevailing working or weather conditions. Engineer shall determine when weather or working conditions are unsuitable for welding.
- C. Base Metal Preparation
 1. All welding material and/or equipment shall, at all times, be protected from damage and kept in good working condition. Filler metals and fluxes shall be protected from deterioration and excessive moisture changes. Welding rods and other materials which

- show signs of deterioration or damage shall be replaced. Welding machines which, in the opinion of Engineer, are in poor repair or are not of sufficient capacity to perform the Work shall be replaced by the Contractor at no cost to the Owner.
2. Suitable windguards shall be provided to protect the Work during periods of excessive wind.
 3. The Contractor shall, at the direction of Engineer, temporarily suspend all welding operations whenever conditions are not conducive to the performance of good Work.
 4. All steel pipe, fittings, connections and fabrications shall be butt welded by the shielded metal arc welding process using a manual welding technique.
 5. All surfaces to be welded shall be properly cleaned and free of material that may be detrimental to the integrity of the completed weld. The ends of pipe and/or fittings at all welded joints shall be properly beveled using an appropriate pipe beveling machine.
 6. Each completed weld shall be free of overlaps, undercuts, excessive convexity, scale, oxides, pin holes, non-metallic inclusions, air pockets and all other defects to the extent allowed by API 1104.
 7. Arc burns on the pipe and/or fittings shall be removed by grinding, provided the resulting pipe wall thickness is not less than ninety (90) percent of the required design wall thickness. Arc burns which cannot be repaired by grinding and repair attempts which result in less than ninety (90) percent of the original wall thicknesses shall be cut out.
 8. All welds shall be air cooled. Accelerated cooling by any method shall not be permitted.

D. Weld Joint Fit-Up

1. Parts that are to be joined by welding shall be fitted, aligned, and retained in position during the welding operation by the use of bars, jacks, clamps, or other mechanical fixtures.
2. Welded temporary attachments shall not be used except when it is impractical to use mechanical fixtures.
3. When temporary attachments are used, they shall be the same material as the base metal, and shall be completely removed by grinding or thermal cutting after the welding operation is completed.
4. If thermal cutting is used, the attachment shall be cut to not less than 1/4 inch from the member and the balance removed by grinding. After the temporary attachment has been removed, the area shall be visually examined.

3.2 EXAMINATIONS, INSPECTIONS, AND TESTS

- A. Visual, nondestructive and/or destructive testing procedures shall be implemented by the Engineer, as required by Owner, to determine the acceptability of the welds. The Owner shall obtain and pay for radiographic testing. Radiographic inspection will be performed on 100% of the welds used in HDD pipe sections and 100% of welds used in road and highway crossings, 100% of regulator station piping, and 100% of all tie-in piping.
- B. Engineer may randomly require up to 10% of remaining welds to be radiographically inspected.

- C. The certified welding inspector (CWI) provided by the Owner shall make all determinations as to what constitutes an acceptable weld as well as the disposition of all defective welds. These determinations shall be made upon completion of either a visual or a radiograph inspection.

3.3 ACCEPTANCE STANDARDS

- A. Nondestructive Testing
 - 1. The acceptance standards of API 1104 shall apply.

3.4 CORRECTIONS AND REPAIRS

- A. Defects shall be removed and repaired as specified in API Standard 1104 and ASME B31.8 unless otherwise specified.
- B. Disqualifying defects discovered between weld passes shall be repaired before additional weld material is deposited.
- C. Wherever a defect is removed, and repair by welding is not required, the affected area shall be blended into the surrounding surface eliminating sharp notches, crevices, or corners.
- D. After defect removal is complete and before rewelding, the area shall be examined by the same test method which first revealed the defect to ensure that the defect has been eliminated.
- E. After rewelding, the repaired area shall be reexamined by the same test method originally used for that area.
- F. Any indication of a defect shall be regarded as a defect unless reevaluation by NDE or by surface conditioning shows that no disqualifying defects are present.
- G. The use of any foreign material to mask, fill in, seal, or disguise welding defects will not be permitted.

END OF SECTION 055101

SECTION 055110 – NATURAL GAS PIPELINE CONSTRUCTION

PART 1 - GENERAL

1.1 REFERENCES

- A. 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. ASME INTERNATIONAL (ASME) (<https://www.asme.org/>)
 - a. B31.8 (2014) - Gas Transmission and Distribution Piping Systems
 - b. B16.5 – Pipe Flanges and Flanged Fittings (13th Edition)
 - c. B16.9 – Factory-Made Wrought Steel Buttwelding Fittings (12th Edition)
 2. American Petroleum Institute (API) (<http://www.api.org/>)
 - a. Standard 1104 – Welding of Pipelines and Related Facilities (21st edition)
 - b. 6D – Pipeline Valves (24th Edition)
 - c. 5L – Specification for Line Pipe (45th Edition, December 2012)
 3. Code of Federal Regulations
 - a. 49 CFR Part 192 – Transportation of Natural Gas and Other Gas By Pipeline (March 5, 2015)
 - 1) http://www.ecfr.gov/cgi-bin/text-idx?SID=b51439f43c89ea89cbc38dd1da5d30a4&tpl=/ecfrbrowse/Title49/49cfr192_main_02.tpl
 - b. 29 CFR Part 1910 – Occupational Safety and Health Standards (OSHA) (March 5, 2015)
 - 1) http://www.ecfr.gov/cgi-bin/text-idx?tpl=/ecfrbrowse/Title29/29cfr1910_main_02.tpl
 - c. 29 CFR Part 1926 – Safety and Health Regulations for Construction (Current Addition)
 - 1) https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=standards&p_id=10593
 4. National Society of Corrosion Engineers (NACE)
 - a. SP0274 – High-Voltage Electrical Inspection of Pipeline Coatings (2011)
 - b. <http://www.nace.org/cstm/Store/Product.aspx?id=c185d3cf-72a4-4018-bf67-b8b6743bbe03>

1.2 RELATED DOCUMENTS

- A. Section 055101 – Natural gas Pipeline Welding
- B. Section 055120 – Regulator Station Construction
- C. Section 017839 – Project Record Drawings
- D. Section 019115 – Pipeline Cleaning, Testing, Drying, Tie-In, Purging and Gas-Up

1.3 SUBMITTALS

- A. The following shall be submitted in accordance with Section 013300:
 - 1. SD-06 Test Reports
 - a. Test reports shall be submitted for the following tests in accordance with Section 019115
 - 2. SD-011 Closeout Submittals
 - a. Fabrication Drawings shall be submitted for all items fabricated by the Contractor or suppliers.
 - b. Prior to final inspection and transfer of the completed facility; all reports, statements, data, and completed checklists for the leak/strength test of the natural gas pipeline shall be submitted to and approved by Engineer as specified in applicable technical specification sections.
 - c. Purging, pipeline cleaning, drying, and gas-up report
 - 1) Prior to final inspection and transfer of the completed facility; all reports, statements, data, and completed checklists for the purging, cleaning, drying, and gas up of the natural gas pipeline shall be submitted to and approved by Engineer as specified in applicable technical specification sections.
 - d. Final Site cleaning and restoration report
 - 1) The premises shall be left clean. Paved areas shall be swept and landscaped areas shall be raked clean. The site shall have waste, surplus materials, and rubbish removed. The project area shall have temporary structures, barricades, project signs, and construction facilities removed. A list of completed clean-up items shall be submitted on the day of final inspection.

1.4 GENERAL REQUIREMENTS

- A. Safety
 - 1. Work performed under this contract shall comply with OSHA requirements in 29 CFR 1910 and 29 CFR 1926, and state specific OSHA requirements where applicable. The Contractor shall develop and implement a Safety and Health Program (SHP) which incorporates requirements in OSHA standards 29 CFR 1910 and 29 CFR 1926.
 - 2. Suitable barricades, lights, applicable signs, flagmen, and watchmen shall be provided when required by the Engineer and/or the North Carolina Department of Transportation in all areas in which Work is performed. All safety related equipment specified herein shall be in full compliance with the minimum governing regulation subject to approval of the Engineer and shall be included in the Contract price.
 - 3. All pressure tests shall be conducted with due regard for the safety of people and property. During the pressure test appropriate precautions shall be taken to keep people not engaged in the testing operations clear of the testing area while the hydrostatic test is in progress.
 - 4. Take every reasonable precaution to protect employees and the public during testing.
 - 5. Only approved tools are to be used for test assemblies and plugs. Any tool or fitting that shows evidence of wear or damage that may affect its safe use shall be repaired or replaced.

6. Construction in the immediate vicinity of the pipeline shall be discontinued during the period of the strength test and not commence until the pipeline has been blown-down to 100 psig or lower internal pressure.
 7. During pigging of the pipeline, the Contractor shall ensure that the exiting pigs are contained within the ditchline and that they cannot escape and cause damage to people or property.
 8. Comply with all permit and notification requirements during the recovery of the hydrostatic test water.
 9. If possible, avoid the use of hoses for filling and de-watering. If hoses must be used, they shall be securely staked and chained to the ground. Hoses and connecting fittings used for the test shall be rated equal to, or above, the maximum hydrostatic test pressure.
 10. During purging operations it is important that all possible sources of ignition be eliminated. Open flames, sparks, heated materials, and materials that can ignite spontaneously in the presence of gas shall not be in the area of purging, especially the vent areas.
 11. Static electricity is one of the major concerns for purging operations and is one of the most difficult ignition hazards to control. Static electricity is often present during purging and it is more serious when the relative humidity is low. To eliminate static electricity during the purging operation the pipe and other equipment used in the purge operation shall be grounded. Before disconnecting pipes and equipment, a bond wire shall be attached to the pipe at two points to provide a connection across the proposed disconnection.
- B. Contractor Qualifications
1. The Contractor shall use only competent and skilled Workmen for the performance of any and all Work on the gas pipeline system, as specified herein. Workmen must be Operator Qualified for covered tasks.
- C. Welding Qualifications
1. Testing and certification of welders, whether by destructive or nondestructive inspection methods, shall be in accordance with Section 055101 and with API 1104, which is hereby incorporated by reference and made a part of these Specifications. The Workmen shall not perform any welding operations on any pipe or associated fittings within the system until they have been qualified to perform such operations in accordance with Section 055101 – Natural Gas Pipeline Welding.
- D. Right-of-Way and Easements
1. Portions of the Work will be carried out within the rights-of-way of State roadways. All provisions pertinent to construction within such rights-of-way as provided in the latest edition of the North Carolina Department of Transportation Policies and Procedures for Accommodating Utilities on Highway Rights-of-Way shall be followed.
 2. The necessary rights-of-way and construction easements for the natural gas pipeline will be provided by The Owner. All construction operations shall be confined to the immediate vicinity of the project location, and due care shall be used in placing construction tools, equipment, excavated materials, and pipeline materials and supplies so as to cause the least possible damage to property and the least interference with traffic. The placing of such tools, equipment, and materials shall be subject to the approval of the Engineer.

3. Construction will be conducted in such a manner as to cause the least inconvenience to the citizens of the area, thereby maintaining good public relations. The Work shall not cause any unnecessary interference with the use of any public or private improvements, including landscaping and/or any unnecessary damage to such improvements. Any damage to such improvements shall be brought back to pre-construction condition, or as otherwise directed by the Engineer.
4. During the execution of the Work, a continuous ingress and egress to all affected parcels and traveled ways shall be maintained. When ingress and egress to affected parcels must be blocked, due to the direct executing of the Work, twenty-four (24) hours advance notice must be given to the affected property Owner. In no case shall the blocking of ingress and egress be allowed for more than twenty-four (24) hours consecutively.

E. Inspection

1. The Owner and Engineer shall have access to the Work at all times. The Engineer shall be present for all special testing or approval of the Work that is required by the Specifications or the Engineer's instructions.
2. The Engineer, in order to be present, shall be given sufficient notice prior to any required testing or approval. The Contractor shall have no claim against the Owner and/or the Engineer for time or monies when sufficient notice, as described above, is not given to the Engineer.
3. The Engineer may require re-examination of any of the Work. If required, the Contractor shall provide all labor, material and equipment necessary to uncover the Work. If the Work is determined to be in accordance with the Specifications, the Owner will pay the costs of re-examination and replacement. If the Work is not in accordance with the Specifications, the Contractor shall pay such costs.
4. Inspectors may be stationed at the Work site to report the Engineer as to the progress of the Work and the manner in which it is being performed. The Inspectors shall report whenever it appears that the materials furnished or the Work performed by the Contractor fails to meet the requirements of the Plans or Specifications.
5. If a dispute arises between the Inspector and the Contractor as to the materials furnished or to the manner of performing the Work, the Inspector shall have the authority to reject the questionable materials or suspend the Work until the issue can be referred to and a decision can be made by the Engineer. Inspectors are not allowed to revoke, alter, enlarge, relax or release any requirements of these Specifications or to issue instructions contrary to the Contract Documents. Inspectors shall in no case act as foremen or perform duties for the Contractor or interfere with the management of the Work by the Contractor.
6. The Owner and Engineer will make a final inspection of the Work included in the Contract as soon as possible after notification from the Contractor that the Work is substantially complete and ready for inspection. If any of the Work is not acceptable at the time of the inspection, the Engineer will advise the Contractor, in writing, as to the particular item(s) to be completed or corrected before the Work can be given final approval and final payment for the Work is approved.

PART 2 - PRODUCTS

2.1 Materials

- A. Owner shall supply all materials listed on the Bills of Material included in the Project Plans. Contractor shall provide all materials not listed on the Bills of Material that are essential for completing the Work according to the Project Plans, Specifications and Permit Requirements.
- B. Materials provided by the Contractor shall be suitable for their intended use and are subject to approval by the Engineer and Owner.
- C. The Contractor shall submit to the Engineer all Information, Data Sheets, and Manuals for items provided to Contractor by suppliers and manufacturers.
- D. Line Pipe
 - 1. 6" steel, API-5L GR B, 0.280" wall thickness
- E. Fittings
 - 1. 6" steel, buttweld, ASME B16.9, SCH 40
 - 2. Ells: 1.5R
- F. Coating
 - 1. Fusion Bonded Epoxy Thinfil, 12 to 14 mils
 - 2. Abrasion Resistant Overcoat: Dura-Bond Powercrete polymer epoxy overcoating, 35 mils
- G. Steel flanged fittings, including bolts, nuts and bolt patterns
 - 1. ASME B16.5
 - 2. ANSI Class 300

PART 3 - EXECUTION

3.1 EQUIPMENT, TOOLS AND LABOR TO BE FURNISHED BY THE CONTACTOR

- A. The Contractor shall provide all equipment, tools and labor necessary for the completion of the WORK specified herein, including but not limited to:
 - 1. Excavation, trenching, and boring equipment;
 - 2. Matting and other materials in support of construction;
 - 3. Pipe cutting and welding equipment and supplies;
 - 4. Testing equipment and fittings;
 - 5. Dewatering equipment;
 - 6. Traffic control devices; and
 - 7. Any and all applicable safety equipment which may be required.

- B. The Contractor shall supply all the material items necessary for the completion of the WORK specified herein that is not included in the Bills of Material included on the Project Plans, including but not limited to:
 - 1. Select fill, sand and gravel;
 - 2. Concrete;
 - 3. Asphalt;
 - 4. Erosion and sediment control materials;
 - 5. Protective rock shields;
 - 6. Paint for above ground piping; and
 - 7. Field applied pipeline coating repair materials.
- C. Workmanship, tools, equipment and materials shall be of good quality meeting established industry standards. The Contractor shall, as required by Engineer, furnish satisfactory evidence as to the kind and quality of materials.
- D. When crossing improved road surfaces with equipment which will damage it, wood boards, flat pads or other approved methods shall be used to prevent damage to the surface.

3.2 PIPE AND MATERIAL HANDLING

- A. All materials shall be handled and placed in a manner which prevents damage and does not interfere with public and private travel.
- B. All pipe handling shall be accomplished using equipment which will not damage the pipe or the pipe coating. All damaged coating shall be repaired and acceptance of same shall be contingent upon approval of Engineer.
- C. Coated steel pipe shall be stacked not more than ten (10) layers high on padded skids in a manner which will not damage the coating.
- D. Care shall be taken during handling so as not to damage the beveled ends of steel pipe. All ends so damaged shall be repaired by removing the end of the pipe and re-beveling the pipe with a pipe beveling machine.
- E. Inspection of Pipe Coatings
 - 1. Contractor shall inspect pipe during receipt from the pipe supplier. Any damage to the protective covering during transit and handling shall be repaired before installation. After field coating and wrapping has been applied, the entire pipe shall be inspected by an electric holiday detector with impressed current set at a value in accordance with NACE RP0274 using a full-ring, spring-type coil electrode. The holiday detector shall be equipped with a bell, buzzer, or other type of audible signal which sounds when a holiday is detected. All holidays in the protective covering shall be repaired immediately upon detection. Labor, materials, and equipment necessary for conducting the inspection shall be furnished by the Contractor.
- F. Joint Repair
 - 1. All steel fittings, valves, pipe joints, piping installed below ground that is not plant coated, and holidays in the plant coating shall be wrapped with a hot applied tape

coating system, such as Tapecoat20, designed for corrosion protection. The thickness of the tape shall be 50 mils. The tape shall be applied with a single, continuous overlap wrapping with at least a 1-inch overlap on the tape.

2. The Contractor shall furnish all labor, equipment and material required, shall prepare all surfaces to be coated and shall apply the coating to all surfaces to be coated.
3. All coating materials, including repair or patch materials, purchased or used under these specifications, shall be packaged in suitable and approved containers. The containers shall be plainly marked with the name of the Manufacturer, type of material and batch or lot number where applicable. Bulk shipments shall be allowed provided the above information is included in the bill of lading.
4. The coating material shall be packaged in containers suitable to keep the contents clean and dry during handling, shipping and storage. Storage and handling conditions shall be in accordance with the Manufacturer's recommendations.
5. Precautions shall be taken during the handling, shipping and storage of all materials to prevent damage to the containers that would result in contamination of the coating materials. All contaminated or otherwise damaged materials shall be discarded.
6. The surface to be coated must be cleaned of all rust, mud, oil, grease, moisture, mill lacquer or other deleterious substances. Wire brushing and/or solvent washing is sufficient in most instances. Weld splatter should be removed by filing.
7. Primer Application
 - a. Welded joints shall be allowed to cool prior to application of primer. A uniform and continuous coat of primer shall be applied in accordance with the Manufacturer's recommendation for the specific tape and primer system being used. The primer coverage and curing or drying time shall be sufficient to insure an effective bond between the substrate and the coating.
 - b. According to manufacturer's recommendations.
8. Tape Application
 - a. Hot-applied tapes are applied by hand or machine, spirally or in a cigarette wrap, after heating to obtain a softening of the coating material. Only enough tape should be heated to insure that it will remain in a liquefied state during application. When being applied by hand, a propane fueled torch with a wide mouth tip is recommended. Application proceeds by alternately heating and wrapping the tape to obtain the tension and the overlap recommended by the Manufacturer. Hot-applied tapes with removable separators require a light bleeding over the exterior surface to insure lap seal. Exterior surface heating is not required for hot-applied tapes designed for machine application or for hot-applied tapes that incorporate the separator liner as a part of the finished application.
 - b. According to manufacturer's recommendations.

G. ALIGNMENT

1. The gas pipeline shall be installed true to the horizontal and vertical alignment indicated on the Plans, or as otherwise directed by the Engineer. The Contractor shall make no deviations to the proposed horizontal and/or vertical alignment of the gas pipe unless otherwise directed to do so by the Engineer.
2. The Contractor shall control the vertical alignment by maintaining the desired 48-inch depth below the surface grade.
 - a. Absolute minimum pipe depth is 36 inches below the surface grade.

3. In such cases where the proposed horizontal and/or vertical pipeline alignment will cause conflict with other utilities and/or structures, or result in less than the specified minimum clearance or cover, the Engineer shall be notified and the pipeline relocated as per the Engineer's direction.

H. PIPE BENDING

1. The Contractor may use pipe bends in place of fabricated fittings to change the horizontal and/or vertical alignment of the pipe when the plans do not call out a fabricated fitting. Fabricated fittings shall be used when they are called out on the plans.
2. All bends in steel pipe shall be made by a smooth bending method. They shall be made with a bending shoe, as approved by the Engineer. When bends are used in steel pipe, they shall be made in the pipe section prior to welding the bent section to the rest of the piping. The steel pipe has a minimum field cold bending radius of 18 pipe diameters.
3. Bends shall be free of wrinkles, buckles, cracks or other evidence of damage or characteristics which, in the opinion of the Engineer, will reduce the quality of the finished pipeline. Miter bends shall not be used. In no case shall a bend section contain a weld joint. The longitudinal weld of steel pipe shall be at the neutral axis of the bend.
4. Field bends in steel pipelines that damage the pipe coating shall require the area of damaged coating to be coated with a hot applied wrap, tape, or other approved coating material prior to lowering the pipe. Bends with radii less than 40D in fusion bonded epoxy coated pipe shall be assumed to cause damage to the pipe coating.

I. MAINTENANCE OF TRAFFIC

1. Contractor shall provide maintenance of traffic according to the Project Plans and Highway Encroachment requirements.

J. PIPE LOCATING DEVICES

1. The Contractor shall be required to install warning tape as a means to warn of placement of the gas pipeline. The warning tape shall be placed from 12-18 inches from grade with the text facing up.

K. LINE MARKERS

1. The Owner shall provide the line markers. The Contractor shall place line markers over the buried gas pipeline as shown on the Project Plans. The line markers shall be placed as close as practical over the buried pipeline.

END OF SECTION 055101

SECTION 055120 – REGULATOR STATION CONSTRUCTION

PART 1 - GENERAL

1.1 REFERENCES

- A. 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. ASME International (ASME) (<https://www.asme.org/>)
 - a. Refer to Section 055110 – Steel Natural Gas Pipeline Construction
 - 2. American Petroleum Institute (API) (<http://www.api.org/>)
 - a. Refer to Section 055110 – Steel Natural Gas Pipeline Construction
 - 3. Code of Federal Regulations
 - a. Refer to Section 055110 – Steel Natural Gas Pipeline Construction
 - 4. NACE
 - a. Refer to Section 055110 – Steel Natural Gas Pipeline Construction

1.2 RELATED DOCUMENTS

- A. Section 055101 – Natural Gas Pipeline Welding
- B. Section 055110 – Natural Gas Pipeline Construction
- C. Section 017839 – Project Record Drawings
- D. Section 019120 – Regulator Station Cleaning, Testing, Tie-In, Purging, and Gas-Up

1.3 SUBMITTALS

- A. The following shall be submitted in accordance with Section 013300:
 - 1. SD-06 Test Reports
 - a. Test reports shall be submitted for the following tests in accordance with Section 019120
 - 2. SD-011 Closeout Submittals
 - a. Fabrication Drawings shall be submitted for all items fabricated by the Contractor or suppliers.
 - b. Prior to final inspection and transfer of the completed facility; all reports, statements, data, and completed checklists for the leak/strength test of the natural gas regulator station shall be submitted to and approved by Engineer as specified in applicable technical specification sections.
 - c. Cleaning, purging, and gas-up report
 - d. Operation and Calibration Report for all station metering and regulation equipment.

1.4 GENERAL REQUIREMENTS

- A. To the extent that the requirements apply to construction of natural gas regulator station, the General Requirements of Section 0551100 apply to this Section.

PART 2 - PRODUCTS

2.1 Materials

- A. Owner shall supply all materials listed on the Bills of Material included in the Project Plans. Contractor shall provide all materials not listed on the Bills of Material that are essential for completing the Work according to the Project Plans, Specifications and Permit Requirements.
 - 1. ANSI 300 flange rating upstream of relief valve
 - 2. ANSI 150 flange rating downstream of relief valve
- B. Materials provided by the Contractor shall be suitable for their intended use and are subject to approval by the Engineer and Owner.
- C. The Contractor shall submit to the Engineer all Information, Data Sheets, and Manuals for items provided to Contractor by suppliers and manufacturers.
- D. Station coating and painting.
 - 1. Contractor shall provide coating materials for regulator station piping and equipment.
 - 2. Contractor shall apply the coating materials according to the manufacturer's recommendations after the station has been leak and strength tested and regulation and meter equipment has been installed.
 - 3. Owner's specification for above ground pipe coating: Sherwin Williams Machine Gray brush paint. Apply according to manufacturer's recommendations.

PART 3 - EXECUTION

3.1 EQUIPMENT, TOOLS AND LABOR TO BE FURNISHED BY THE CONTACTOR

- A. A. The Contractor shall provide all equipment, tools and labor necessary for the completion of the WORK specified herein and in the Project Plans.
- B. Contractor shall develop the site according to the Project Plans and Specifications.
- C. After completion of testing, installation of meter and regulation equipment, and connection of electrical and telemetry connections, Contractor shall ensure that the stations function as intended to the satisfaction of the Engineer and Owner before submitting Notice of Final Completion.
- D. Owner shall provide power, telemetry and SCADA connection to the regulator station sites.
- E. Contractor shall install conduit and conductors provided by Owner.

- F. Owner shall make all electrical, telemetry and SCADA connections and activate these systems.
- G. To the extent that they apply to regulator station construction, the requirements of Section 055110, Part 3, 3.1 apply to this Section.

3.2 PIPE AND MATERIAL HANDLING

- A. To the extent that they apply to regulator station construction, the requirements of Section 055110, Part 3, 3.2 apply to this Section.

3.3 ACCEPTANCE STANDARDS

- A. Acceptable x-ray of welds,
- B. Acceptable leak and strength tests,
- C. Acceptable functioning of all station equipment as intended,
- D. Acceptance of final station leak test (soap test),
- E. Completion of all coating of station piping and equipment, and
- F. Completion of all station site work.

END OF SECTION 055101

SECTION 264200 - CATHODIC PROTECTION

PART 1 - GENERAL

1.1 SUMMARY

- A. The Work covered by these Specifications consists of the performance of all operations and the furnishing of all labor, and incidental materials as required for the construction of the impressed current cathodic protection system as shown in the project plans; complete, tested, and accepted.
- B. A complete, operating impressed current cathodic protection system as shown in the project plans and in accordance with NACE RP0169, NFPA 70, the applicable federal, state and local regulations, and the requirements of this contract shall be installed and commissioned. The cathodic protection system shall consist of one (1) groundbed and rectifier location, test stations, reference electrodes, and isolating fittings as indicated in the project plans.
- C. In addition to the minimum requirements of these specifications, construction of the cathodic protection system shall be in compliance with 49 CFR 192. The system shall include all the equipment required for a complete operating system providing the specified protection.
- D. Specifications for material and equipment furnished by Owner are provided for Contractor information purposes. The Owner will furnish all material listed on the Bills of Material in the Project Plans. The Contractor shall be responsible for materials not specifically listed that are needed for Construction.

1.2 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
- B. References
The publications listed below form a part of this section to the extent referenced. The publications are referred to in the text by the basic designation only.
 - 1. Code of Federal Regulations
 - a. 49 CFR Part 192 – Transportation of Natural Gas and Other Gas By Pipeline (March 5, 2015)
 - 1) http://www.ecfr.gov/cgi-bin/text-idx?SID=b51439f43c89ea89cbc38dd1da5d30a4&tpl=/ecfrbrowse/Title49/49cfr192_main_02.tpl
 - 2. National Society of Corrosion Engineers (NACE)
 - a. RP0169 – Control of External Corrosion on Underground or Submerged Metallic Piping Systems (2013)
 - 1) <http://www.nace.org/cstm/Store/Product.aspx?id=7f66c2c2-0a8b-442c-8cfb-3dd0b7cdd8b4>

3. American National Standards Institute (ANSI)
 - a. C119.1 – Electric Connectors – Sealed Insulated Underground Connector Systems Rated 600 Volts (2011)
 - 1) https://global.ihs.com/search_res.cfm?&rid=Z06&mid=5280
4. American Society for Testing and Materials (ASTM)
 - a. D 1248-12 – Standard Specification for Polyethylene Plastics Extrusion Molding Materials for Wire and Cable
 - 1) <http://www.astm.org/Standards/D1248.htm>
 - b. B 3-13 – Standard Specification for Soft and Annealed Copper Wire
 - 1) <http://www.astm.org/Standards/B3.htm>
 - c. B 8-11 – Standard Specification for Concentric-Lay-Stranded Copper Conductors, Hard, Medium-Hard or Soft
 - 1) <http://www.astm.org/Standards/B8.htm>
5. National Electrical Manufacturer's Association (NEMA) (NC - IECC 2009 or ASHRAE 90.1 2007)
 - a. ICS 6 – Industrial Control and Systems Enclosures (1993, R2001, R2006)
 - 1) <http://www.nema.org/Standards/Pages/Industrial%20Control%20and%20Systems%20Enclosures.aspx>
 - b. RN 1 – Polyvinyl-Chloride (PVC) Externally Coated Galvanized Rigid Steel Conduit and Intermediate Metal Conduit (2005, R2013)
 - 1) <http://www.nema.org/Standards/Pages/Polyvinyl-Chloride-Externally-Coated-Galvanized-Rigid-Steel-Conduit-and-Intermediate-Metal-Conduit.aspx>
 - c. TC 2 – Electrical Plastic Tubing (EPT) and Conduit (EPC-40 and EPC-80) (2013)
 - 1) <http://www.nema.org/Standards/ComplimentaryDocuments/Contents%20and%20Scope%20NEMA%20TC%202-2013.pdf>
6. National Fire Protection Association (NFPA)
 - a. 70 – National Electric Code (2014)
 - 1) <https://www.nfpa.org/Login>
7. Underwriters Laboratories (UL)
 - a. 467 - Grounding and Bonding Equipment (2013, 10th Edition)
 - 1) <http://ulstandards.ul.com/standard/?id=467>
 - b. 506 – Specialty Transformers (2008, 13th Edition)
 - 1) <http://ulstandards.ul.com/standards-catalog/?search=506>
 - c. 510 – Polyvinyl Chloride, Polyethylene and Rubber Insulating Tape (2005, 8th Edition)
 - 1) <http://ulstandards.ul.com/standards-catalog/?search=510>
 - d. 514A – Metallic Outlet Boxes (2013, 11th Edition)
 - 1) <http://ulstandards.ul.com/standards-catalog/?search=514A>
 - e. 514B – Conduit, Tubing, and Cable Fittings (2012, 6th Edition)
 - 1) <http://ulstandards.ul.com/standards-catalog/?search=514B>
 - f. 6 – Electrical Rigid Metal Conduit – Steel (2007, 14th Edition)
 - g. 486A–486B– Wire Connectors (2013, 2nd Edition)
 - 1) <http://ulstandards.ul.com/standards-catalog/?search=486A>

1.3 PERFORMANCE REQUIREMENTS

A. CONTRACTOR Qualifications

1. The Engineer shall provide the services of a Corrosion Engineer to inspect and test the installation of the cathodic protection system. Corrosion Engineer refers to a registered professional engineer with certification or licensing that includes education and experience in cathodic protection of buried or submerged metal structures, or a person certified by the National Association of Corrosion Engineers at the level of Corrosion Specialist or Cathodic Protection Specialist.
2. The CONTRACTOR shall use only competent and skilled Workmen for the performance of any and all WORK on the cathodic protection system, as specified herein.
3. The CONTRACTOR shall ensure that the cathodic protection system is installed, tested, and placed into service in accordance with the requirements specified.
4. Contractor recommended modifications to the cathodic protection system must be developed by a qualified, NACE Certified Corrosion Engineer or Cathodic Protection Specialist acceptable to the Engineer and Owner in order for the recommendations to be considered.

1.4 SUBMITTALS

A. Preconstruction Submittals

1. Contractor's Modifications
 - a. Six copies of detail drawings showing proposed changes in location, scope or performance indicating any variations from, additions to, or clarifications of contract drawings. The drawings shall show proposed changes in anode arrangement, anode size and number, anode materials and layout details, conduit size, wire size, mounting details, wiring diagram, method for electrically isolating each pipe, and any other pertinent information to the proper installation and performance of the system.

B. Product Data

1. Owner will provide all materials listed in the Project Plans bills of material.
2. Contractor shall provide product information for all materials installed that are not provided by Owner.

C. Test Reports

1. Test reports shall be performed by the Engineer and submitted in booklet form tabulating the following field tests and measurements performed in accordance with the paragraph entitled, "Tests and Measurements," of this section. Each test report shall indicate the final positions of controls.
 - a. Base Potential Tests
 - b. Permanent Reference Electrode Calibration
 - c. Rectifier System Testing
 - d. Energized Potential Tests
 - e. Insulation Joint Testing
 - f. Initial Cathodic Protection System Field Test Report

D. Certificates

1. CONTRACTOR shall furnish Qualifications of personnel installing cathodic protection measures in accordance with paragraph 1.3 of this section.
2. Proof that the materials and equipment furnished under this section that are not furnished by the OWNER conform to the specified requirements contained in the referenced standards or publications. The label or listing by the specified agency will be acceptable evidence of such compliance.

E. Closeout Submittals

1. Not applicable for Owner furnished equipment and materials.

1.5 CONTRACTOR'S MODIFICATIONS

- A. The specified system is based on an impressed current system designed by the Engineer and furnished by the Owner. The Contractor may recommend modifications to the cathodic protection system after review of the project. However, Owner-supplied equipment and materials shall be used. Any modifications shall be fully described and shall be approved by the Engineer and Owner.

1.6 QUALITY ASSURANCE

- A. Contractor modifications must be certified by a Cathodic Protection Engineer or Specialist per requirements of section 1.3 of this Specification.
- B. All installation and commissioning shall be performed by qualified personnel according to the requirements of section 1.3 of this Specification.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. If anodes are not stored in a building, tarps or similar protection shall be used to protect anodes from inclement weather.

PART 2 - PRODUCTS

2.1 IMPRESSED CURRENT ANODES (Provided by OWNER)

- A. Prepackaged (Canister) LIDA Pack Canister Mixed-Metal Oxide Anodes (Model #LP 3x80 H).
- B. Anode Lead Wires
 1. Furnished with anodes

2.2 RECTIFIERS AND ASSOCIATED EQUIPMENT (Furnished by the Owner)

- A. Rectifier Unit

1. The rectifier will be a Universal Rectifier Model, ASAI-25-10-AACR. The rectifier unit will consist of a transformer, rectifying elements, transformer tap adjuster, terminal block, one dc output voltmeter, one dc output ammeter, one toggle switch for each meter, fuse holders with fuses for each dc circuit, variable resistors, an ac power-supply circuit breaker, and lightning arresters for both input and output, all wired and assembled in a weatherproof metal cabinet.
 2. The electrical ratings shall be as follows: input voltage at 60 Hz, 115/230 volts single phase.
 - a. Output voltage, dc: 25 volts
 - b. Output current, dc: 10 amperes
- B. Cabinet
1. Furnished.
- C. Meters
1. Integral
- D. Circuit Breakers
1. Integral
- E. Fuses
1. Integral
- F. Wiring Diagram
1. Furnished with equipment.
- G. Grounding Provisions
1. Grounding provisions will comply with NFPA 70 and UL 467. Grounding conductor from terminal to earth grounding system will be solid or stranded copper not smaller than No. 6 AWG. Earth grounding system shall consist of one or more copper clad steel rods. Ground rods shall be 10 feet long.
- H. Wiring
1. Wiring shall be installed in accordance with NFPA 70 utilizing type TW or RHW or polyethylene insulation. Fittings for conduit and cable work shall conform to UL 514A. Conduit will be provided by the Owner. Conductors shall be color coded for identification.
- 2.3 MISCELLANEOUS MATERIALS (Furnished by Owner)
- A. Conduit, Wire , and Cable for Power Service at 600 Volts or Less.
1. Conduit
 - a. Metallic conduit and fittings to be polyvinylchloride coated in accordance with NEMA RN 1, Type A40. Conduit shall be UL 6, rigid galvanized steel; Outlet boxes: UL 514A and, Fittings: UL 514B, threaded hubs.
 2. Cable and Wire other than the Anode Lead Wires
 - a. Copper conductors shall conform to ASTM B 3 and ASTM B 8. Wires terminating at a rectifier, junction box, or test station shall have cable identification tags.

- b. Rectifier D.C. Negative Cable shall conform to ASTM D 1248, High Molecular Weight Polyethylene (HMWPE) insulation, stranded copper conductors, gage (AWG) as indicated in the Plans.
 - c. Rectifier D.C. Positive Anode Header Cable shall conform to ASTM D 1248, High Molecular Weight Polyethylene (HMWPE) insulation, stranded copper conductors, gage (AWG) as indicated in the Plans.
 - 3. Anode Header Cable
 - a. Cable for anode header and distribution shall be AWG No. 4 stranded copper wire with type CP high molecular weight polyethylene insulation, 110 mils thick insulation, 600-volt rating, in accordance with NEMA WC 5. Splices are not permitted in buried sections of anode header cable.
 - 4. Test Wires
 - a. Test wires shall be AWG No. 12 solid copper wire with NFPA 70 Type TW or RHW or polyethylene insulation.
 - 5. Anode Lead Connections
 - a. Wire connections shall be by 3M Splice Kit.
 - 6. Cable and Wire Identification Tags
 - a. Laminated plastic material with black letters on a yellow background material with stamped or engraved letters. Print letters and numbers a minimum of 3/16 inch in size.
 - 7. Buried Cable Warning and Identification Tape
 - a. Polyethylene tape, manufactured for warning and identification of buried cable and conduit. Tape shall be 3 inches wide, yellow in color and read "Caution Buried Cable Below" or similar. Color and lettering shall be permanent and unaffected by moisture or other substances in backfilling.
- B. Test Stations
 - 1. Flush Mounted Type
 - a. Metallic or non-metallic with terminal board, 3 or 5 terminal posts as indicated in the Project Plans. A non-metallic enclosure shall be molded of glass filled polycarbonate and urethane coated or ABS plastic and mounted on an 18 inch length of PVC conduit. The unit shall be of standard design, manufactured for use as a cathodic protection test station, complete with cover, terminal board, shunts, and brass or Type 304 stainless steel hardware. The terminal board shall be removable for easy access to wires. Provide traffic valve box capable of withstanding H-20 traffic loads. The cover shall have a cast in legend "CP TEST."
 - 2. Post Mounted Type
 - a. Metallic or non-metallic with terminal board, 3 or 5 terminal posts as indicated in the Project Plans and lockable lid. An enclosure shall be a standard design, COTT Model COTT-BFTS for use as a cathodic protection test station, complete with cover, terminal board, shunts, and brass or Type 304 stainless steel hardware. The terminal board will be removable for easy access to wires. The test station shall be mounted atop 6 foot long polyethylene conduit with anchor.
- C. Terminal Boards
 - 1. Integral
 - 2. Each conductor shall be color-coded as follows:
 - a. Anode lead wire- black

- b. Structure lead wire- white
 - c. Reference electrode lead wire- red
 - d. Tracer wire lead (for transition fittings) - yellow
- D. Permanent Reference Electrodes
 - 1. Client determined

2.4 EXOTHERMIC WELDING MATERIALS (Provided by Owner)

- A. Exothermic Weld Kits: Specifically designed by manufacturer for welding materials and shapes required.
 - 1. Thermite Weld Mold, Cadweld Flat Mold for No.4 wire
 - 2. Thermite Weld Mold, Cadweld 15g charge
 - 3. Thermite Weld Coating Repair, Royston Handy Cap 1P

PART 3 - EXECUTION

3.1 GENERAL INSTALLATION REQUIREMENTS

- A. Comply with ANSI/IEEE C2 and NFPA 70.
- B. Make connections to ferrous pipe using exothermic welding.
- C. Coat welds with the coating repair material and apply an exothermic weld cap.

3.2 CRITERIA OF PROTECTION

- A. Criteria for determining the adequacy of protection on a buried pipe shall be in accordance with NACE RP0169 and shall be selected by the Engineer and Owner as applicable.
- B. One of the following methods shall apply:
 - 1. A negative voltage of at least minus 0.85 volts as measured between the pipe and a saturated copper-copper sulphate reference electrode contacting the earth directly over the pipe. Determination of this voltage shall be made with the cathodic protection system in operation.
 - 2. A negative voltage shift of at least 300 millivolts as measured between the pipe and a saturated copper-copper sulphate reference electrode contacting the earth directly over the pipe. Determination of this voltage shift shall be made with the protective current applied. These criteria apply to pipes not in electrical contact with dissimilar metals.
 - 3. A minimum polarization voltage shift of 100 millivolts as measured between the pipe and a saturated copper-copper sulphate reference electrode contacting the earth directly over the pipe. This polarization voltage shift shall be determined by interrupting the protective current and measuring the polarization decay. When the protective current is interrupted, an immediate voltage shift will occur. Voltage reading, after the immediate shift, shall be used as the base reading from which to measure polarization decay.

3.3 GROUND BED INSTALLATION

- A. The anode system shall consist of a group of anodes connected in parallel to a header cable. The buried pre-packaged canister anodes shall be installed in vertical holes in the ground having depth, spacing, and locations as shown in the project Plans. The holes in the ground shall be sufficiently larger in diameter than the canisters to facilitate easy lowering into the hole and backfilling. The space between the canister and the wall of the hole shall be completely backfilled with a wet slurry of earth free of stones.
- B. Do not lift or support anode by the lead wire. Exercise care to preclude damaging the anode and the lead wire insulation.
- C. Cable Protection
 - 1. Positive cable to the ground bed and negative cable to the pipe to be protected shall be buried a minimum depth of 30 inches except where above ground construction utilizing conduit is used.
- D. Anode Requirements
 - 1. Anode sizes, spacing, number of anodes, depth of anodes, and other details shall be as shown on the project Plans.

3.4 MISCELLANEOUS INSTALLATION

- A. Rectifier Installation
 - 1. Mounting shall be as shown on the project plans. Pole mounting shall be equipped with a channel bracket, lifting eyes, and a keyhole at the top.
- B. Wire and Pipe Connections
 - 1. Connections to the pipe shall be made by an approved exothermic welding process following the instructions of the manufacturer. Installation shall be in strict accordance to manufacturer's recommendations.
 - 2. Before the anode lead connection is made, the pipe shall be inspected to verify that the condition of the pipe is sound for making an exothermic weld. If the condition of the pipe is proven to be sound, the pipe connection area shall be cleaned to bare metal by means of scraping, filing or other approved methods. Cleaning of the pipe shall be by manual methods and no power-driven wheels or wire brushes shall be used.
 - 3. After the anode lead or test lead to pipe connections have been made, they shall be covered with mastic sealant and plastic shield.
 - 4. Anode lead connection to test station terminals shall be made with insulated compression ring terminals.

3.5 TESTING

- A. Initial Cathodic Protection System Field Testing
 - 1. The systems shall be tested for functionality by the Contractor and inspected by the Engineer and Owner. The Engineer will record test data, including date, time, and locations of testing. Contractor shall correct, at his expense (to the extent furnished or

damaged by Contractor), all deficiencies in the materials and installation observed by these tests and inspections. Contractor shall pay for retests made necessary by the corrections to the extent that retest is necessary due of Contractor installation or Contractor supplied materials. Testing shall include the following measurements:

- a. Base Potential Tests: At least 24 hours after backfilling of the pipe to be protected, but before energizing of the cathodic protection system, measure the pipe-to-soil potentials of the pipe. Perform measurements at anode junction boxes, test stations and other locations suitable for test purposes with readings at each end point and the midpoint as a minimum. The locations of these measurements shall be identical to the locations specified for measuring energized potentials. Use the same measuring equipment that is specified for measuring protected potential measurements.
 - b. Permanent Reference Electrode Calibration: Verify calibration of the reference electrode by measuring the potential difference between the permanent reference electrode and an independent portable calibrated reference electrode placed in the soil or water adjacent to or as close as practical to the permanent reference electrode. Potential differences between the two electrodes of the same generic type should not exceed 15 millivolts. Permanent reference electrodes not within these potential differences shall be removed from the construction site by the end of the day and replaced at the CONTRACTOR's expense. The testing provision shall also apply to replacement reference electrodes as well.
 - c. Insulation Joint Testing: Perform insulation testing at each insulating joint or fitting prior to burying the joint or fitting before and after the cathodic protection system is energized. Before energizing, test using an insulation checker. After energizing, test the insulation by measuring the potential shift on both sides of the insulating joint. This testing shall demonstrate that no metallic contact or short circuit exists between the two insulated sections of the pipe. Report and repair defective insulating fitting at the Contractor's expense if damage is due to installation and not defective material.
 - d. Rectifier System Testing: Upon completion of the installation, "Baseline Potential Tests", and "Insulation Joint Tests", energize and adjust each rectifier. Measure D.C. outputs of the rectifier and current outputs of each associated ground bed at different rectifier settings. Measure the current outputs across the installed shunts. Verify these readings using portable, calibrated meters and shunts. This testing shall demonstrate if the rectifier system is capable of functioning properly as required to provide effective cathodic protection.
 - e. Energized Potential Tests: With the entire cathodic protection system put into operation for at least 24 hours, measure pipe-to-soil potentials along the pipeline and at all casings using a portable copper/copper sulfate and all permanent reference electrode(s) and a voltmeter having an input impedance of not less than 10 megohms. The locations of these measurements shall be identical to the locations used for the base potential measurements.
2. Initial Cathodic Protection System Field Test Report
 - a. The Engineer shall submit a field test report of the cathodic protection system test performed by the Engineer. The Contractor with the assistance of the Engineer and/or Owner shall locate and correct any short circuits encountered during the checkout of the installed cathodic protection system.

3.6 TRAINING

- A. During the testing and at a time designated by the Owner, the Contractor shall make available the services of a technician experienced in the cathodic protection system for instructing Owner's personnel in the proper operation, maintenance, safety, and emergency procedures of the cathodic protection system. The period of instruction shall be not less than one but not more than two 8-hour working day[s]. Conduct the training at the jobsite or at another location mutually satisfactory to the Owner and the Contractor. The field instructions shall cover all of the items contained in the operation and maintenance manual.

3.7 OPERATING INSTRUCTIONS

- A. The CONTRACTOR shall assemble an operation and maintenance manual for submission to the Owner following system acceptance. The O&M manual shall detail the training provided by the Contractor and contain all relevant information as described in subpart 1.4 of this section.

END OF SECTION 264200

SECTION 264210 – AC MITIGATION

PART 1 - GENERAL

1.1 SUMMARY

- A. The WORK covered by these Specifications consists of the performance of all operations and the furnishing of all labor, and incidental materials as required for the construction of the AC Mitigation System as shown in the project plans; complete, tested, and accepted.
- B. Specifications for material and equipment furnished by OWNER are listed in the Bills of Material on the Project Plans.

1.2 RELATED DOCUMENTS

- A. Plans and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
- B. Section 264200 – Cathodic Protection

1.3 REFERENCES

- A. The publications listed below form a part of this section to the extent referenced. The publications are referred to in the text by the basic designation only.
 - 1. National Society of Corrosion Engineers (NACE)
 - a. SP0177, 2007 – Mitigation of Alternating Current and Lightning Effects on Metallic Structures and Corrosion Control Systems
 - 1) <http://www.nace.org/cstm/Store/Product.aspx?id=46f87241-7ac5-49e8-9dcf-6b4e18de3312>

END OF SECTION 264210

SECTION 311000 - CLEARING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
- B. Project permits.

1.2 SUMMARY

- A. Section Includes:
 - 1. Protecting existing vegetation to remain.
 - 2. Removing existing vegetation.
 - 3. Clearing and grubbing.
 - 4. Stripping and stockpiling topsoil per land owner agreement.
 - 5. Stripping and removing rock – no rock is expected.
- B. Related Requirements:
 - 1. Section 015100 – Environmental Protection
 - 2. Section 015100 – Environmental Protection
 - 3. Section 015200 – Erosion and Sediment Control
 - 4. Section 017419 – Construction Waste Management and Disposal
 - 5. Section 315100 - Excavation, Trenching and Backfilling.

1.3 DEFINITIONS

- A. Subsoil: Soil beneath the level of subgrade; soil beneath the topsoil layers of a naturally occurring soil profile, typified by less than 1 percent organic matter and few soil organisms.
- B. Surface Soil: Soil that is present at the top layer of the existing soil profile. In undisturbed areas, surface soil is typically called "topsoil," but in disturbed areas such as urban environments, the surface soil can be subsoil.
- C. Topsoil: Top layer of the soil profile consisting of existing native surface topsoil or existing in-place surface soil; the zone where plant roots grow.
- D. Topsoil: Top layer of the soil profile consisting of existing native surface topsoil or existing in-place surface soil; the zone where plant roots grow. Its appearance is generally friable, pervious, and black or a darker shade of brown, gray, or red than underlying subsoil; reasonably free of subsoil, clay lumps, gravel, and other objects larger than 2 inches (50 mm) in diameter; and free of weeds, roots, toxic materials, or other nonsoil materials.

- E. Plant-Protection Zone: Area surrounding individual trees, groups of trees, shrubs, or other vegetation to be protected during construction and indicated on Drawings.
- F. Tree-Protection Zone: Area surrounding individual trees or groups of trees to be protected during construction and indicated on Drawings and according to land owner agreement.
- G. Vegetation: Trees, shrubs, groundcovers, grass, and other plants.

1.4 PREINSTALLATION MEETINGS

- A. Engineer will point out special clearing requirements during preconstruction meeting.

1.5 MATERIAL OWNERSHIP

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

1.6 INFORMATIONAL SUBMITTALS

- A. Contractor is encouraged to take pre-construction condition photographs or videos dated and labeled to reference location along the alignment. Documentation should include existing trees and plantings, adjoining construction site that establishes preconstruction conditions that might be misconstrued as damage caused by site clearing.
- B. Topsoil stripping and stockpiling program according to landowner requirements listed on Project Plans.
- C. Record Drawings: Identifying and accurately showing locations of utilities and other subsurface structural, electrical, and mechanical facilities and conditions.
- D. Burning: Not permitted on the site. Contractor may remove debris from the site and burn off-site at Contractor's discretion. Contractor is responsible for obtaining all permits related to off-site stockpiling and burning.

1.7 QUALITY ASSURANCE

- A. Responsibility of Contractor.
- B. Owner will provide Construction Inspector to ensure Contractor adheres to Plans and Specifications.

1.8 FIELD CONDITIONS

- A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during site-clearing operations.

1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction.
 2. Provide alternate routes around closed or obstructed trafficways if required by Owner or authorities having jurisdiction.
 3. All work near roads and highways shall be completed in accordance with the terms and conditions of the NCDOT Highway Encroachments and Project Plans.
- B. Salvageable Improvements: Carefully remove items indicated to be salvaged and store on Owner's premises. No salvageable improvements have been located during design; Contractor to verify.
- C. Utility Locator Service: Notify North Carolina One Call at 811 or 1-800-632-494 or on the NC811 Website at www.nc811.org a minimum of 72 hours prior to the start of clearing for the area where Project is located.
- D. Do not commence site clearing operations until temporary erosion- and sedimentation-control measures are in place.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Satisfactory Soil Material: Requirements for satisfactory soil material are specified in Section 315100 - Excavation, Trenching and Backfilling.
1. Obtain approved borrow soil material off-site when satisfactory soil material is not available on-site.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Protect and maintain benchmarks and survey control points from disturbance during construction.
- B. Verify that trees, shrubs, and other vegetation to remain or to be relocated have been flagged and that protection zones have been identified and enclosed according to the Project Plans, land owner agreement and easement condition.
- C. Protect existing site improvements to remain from damage during construction.
1. Restore damaged improvements to their original condition, as acceptable to Owner.

3.2 TEMPORARY EROSION AND SEDIMENTATION CONTROL

- A. Provide temporary erosion- and sedimentation-control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to erosion- and sedimentation-control Drawings and requirements of authorities having jurisdiction.
- B. Verify that flows of water redirected from construction areas or generated by construction activity do not enter or cross protection zones.
- C. Inspect, maintain, and repair erosion- and sedimentation-control measures during construction until permanent vegetation has been established.
- D. Remove erosion and sedimentation controls, and restore and stabilize areas disturbed during removal.

3.3 TREE AND PLANT PROTECTION

- A. Protect trees and plants remaining on-site according to requirements of the project plans, owner agreement and easement conditions.
- B. Repair or replace trees, shrubs, and other vegetation indicated to remain or be relocated that are damaged by construction operations according to requirements of the project plans, owner agreement and easement conditions.

3.4 EXISTING UTILITIES

- A. CONTRACTOR must notify North Carolina One-Call Center a minimum of 72 hours before beginning clearing per section 1.8.
- B. Locate, identify, avoid and make safe for construction any underground utility in the construction site. Including those marked on the plans and listed below and those identified during construction.
 - 1. Water mains.
 - 2. Sewer force mains.
 - 3. Telecommunication cables.
 - 4. Underground (and overhead) electric cables.
- C. Locate, identify, and disconnect utilities indicated to be abandoned in place.
- D. Interrupting Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others, unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:
 - 1. Notify Engineer not less than two (2) days in advance of proposed utility interruptions.

2. Do not proceed with utility interruptions without Engineer and Owner's written permission.
- E. Excavate for and remove underground utilities indicated to be removed.

3.5 CLEARING AND GRUBBING

- A. Remove obstructions, trees, shrubs, and other vegetation to permit installation of new construction.
 1. Do not remove trees, shrubs, and other vegetation indicated to remain or to be relocated.
 2. Grind down stumps and remove roots as necessary to facilitate construction, staging and access.
 3. Chip removed tree branches and dispose of off-site.
- B. Fill depressions caused by clearing and grubbing operations with satisfactory soil material unless further excavation or earthwork is indicated.
 1. Place fill material in horizontal layers not exceeding a loose depth of 8 inches (200 mm), and compact each layer to a density equal to adjacent original ground.

3.6 TOPSOIL STRIPPING

- A. Remove sod and grass before stripping topsoil.
- B. Strip topsoil to depth indicated on Drawings and according to owner agreement and easement conditions in a manner to prevent intermingling with underlying subsoil or other waste materials.
- C. Stockpile topsoil away from edge of excavations without intermixing with subsoil or other materials. Grade and shape stockpiles to drain surface water. Cover to prevent windblown dust and erosion by water only as required by property owner agreement or easement conditions as included on the project plans.
 1. Limit height of topsoil stockpiles to 72 inches (1800 mm).
 2. Do not stockpile topsoil within protection zones

3.7 SITE IMPROVEMENTS

- A. Handle existing site improvements as indicated on the Project Plans.

3.8 DISPOSAL OF SURPLUS AND WASTE MATERIALS

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

- B. Burning tree, shrub, and other vegetation waste is not permitted on the Project Site.
- C. Separate recyclable materials produced during site clearing from other nonrecyclable materials. Store or stockpile without intermixing with other materials, and transport them to recycling facilities.

END OF SECTION 311000

SECTION 315001 – EXCAVATION, TRENCHING AND BACKFILLING FOR PIPELINE

PART 1 - GENERAL

1.1 SUBMITTALS

- A. The following shall be submitted in accordance with Section 012500 Submittal Procedures:
 - 1. SD-06 Test Reports
 - a. Field Density Tests upon request of Engineer in NCDOT right-of-way or where the Engineer determines that compaction and soil conditions warrant testing.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Satisfactory Materials
 - 1. Materials which do not comply with the requirements for satisfactory materials are unsatisfactory. Unsatisfactory materials also include man-made fills, trash, refuse, or backfills from previous construction. Unsatisfactory material also includes material classified as satisfactory which contains root and other organic matter, frozen material, and stones larger than 1 inch. Engineer shall be notified of any contaminated materials.
- B. Unstable Material
 - 1. Unstable material shall consist of materials too wet to properly support the utility pipe, conduit, or appurtenant structure.
- C. Select Granular Material (Select fill)
 - 1. Select granular material shall consist of well-graded sand, gravel, crushed gravel, crushed stone or crushed slag composed of hard, tough and durable particles, and shall contain not more than 10 percent by weight of material passing a No. 200 mesh sieve and no less than 95 percent by weight passing the 1 inch sieve.
- D. Initial Backfill Material
 - 1. Initial backfill shall consist of select granular material or satisfactory materials free from rocks 1 inch or larger in any dimension or free from rocks of such size as recommended by the pipe manufacturer, whichever is smaller. Initial backfill shall consist of naturally occurring sand or manufactured stone sand. Natural sand shall consist of grains of hard, sound material, predominantly quartz, occurring in natural deposits. Manufactured sand shall consist of sound crushed particles of stone, essentially free from flat or elongated pieces, with sharp edges and corners removed. All sand shall be clean and free from foreign matter such as loam, dirt, sticks, roots, leaves, silt, vegetable matter and oil or dyestuffs.
- E. PLASTIC MARKING TAPE

1. Warning tape shall have a minimum 5.0 mil overall thickness. The warning tape, including labeling, shall not contain any dilutants, pigments or other contaminants, and shall resist degradation by elements encountered in the soil. The warning tape shall be color coded yellow for gas and imprinted with the words "Caution - Buried Gas Main Below".

PART 3 - EXECUTION

3.1 LOCATION OF OTHER UTILITIES

- A. Engineer assumes no responsibility for the existence and/or location of any other utilities in the Work area. It shall be the responsibility of the Contractor, to investigate and verify the existence and location of all utilities within the vicinity of the Work.
- B. The Contractor shall comply with all the provisions of the North Carolina Excavation Manual. At least seventy-two (72) hours prior to starting the Work the Contractor shall verify the existence and location of all underground utilities, structures and associated appurtenances. The Contractor shall notify the Owner and **North Carolina One-Call (811) or (800-632-4949) or through their Website at nc811.org** to locate all participating underground utilities. The Contractor shall be responsible for identifying all utilities in the Work area which are not participating members of the one-call system. These utility operators shall be provided with a minimum seventy-two (72) hours notice to have their facilities located prior to starting the WORK.
- C. The excavation of test holes may be required by the Contractor to ascertain the existence, location, size, type, and alignment of existing utilities or underground structures. The dimensions of these test holes shall be the minimum required to effectively locate said utilities and underground structures.
- D. In the event that any gas lines, water lines, sewer lines, electric lines, cables, conduit, and/or any other existing utility, either underground or above ground, are damaged by the Contractor during the execution of the Work, the owner of the damaged utility shall be notified immediately. If approved and/or requested by the owner of the damaged utility, the Contractor shall immediately make the necessary repairs, to the satisfaction of the utility and Engineer.

3.2 REQUIRED CLEARANCE

- A. Regardless of the method of installation, whether by open trench, directional drilling, or boring, all gas mains shall be installed such that a minimum of twenty-four (24) inches, or as otherwise specified by the Engineer, horizontal and vertical clearance is maintained from all other existing underground utilities and/or structures, thereby permitting proper routine maintenance and protection against damage which may result from proximity to the utilities and/or structures.

3.3 ALIGNMENT

- A. All gas pipes shall be installed true to the horizontal and vertical alignment indicated on the Plans, or as otherwise directed by the Engineer. The Contractor shall make no deviations to the proposed horizontal and/or vertical alignment of the gas pipes unless otherwise directed to do so by Owner or the Engineer.
- B. In such cases where the proposed horizontal and/or vertical pipeline alignment will cause conflict with other utilities and/or structures, or result in less than the specified minimum clearance or cover, Engineer shall be notified and the pipeline relocated as per Engineer's direction.

3.4 REQUIRED COVER

- A. Regardless of the method of installation; whether by open trench, directional drilling, or boring, all gas mains shall be installed such that a minimum cover of forty-eight (48) inches is provided between the top of the pipe or casing pipe and the finished grade. A depth of thirty-six (36) inches may be accepted by the Engineer under certain circumstances.
- B. When the mains cross creeks, land subjected to flooding, or major drainage ditches, a minimum of forty eight (48) inches of cover shall be provided, or as otherwise specified on the project plans.
- C. The Contractor may, upon the approval of the Engineer, install gas pipes with less cover when the specified minimum cover cannot be obtained, provided the pipe is adequately protected from all superimposed loads by means of approved sleeving or shielding.

3.5 DIRECT BURIAL

- A. The Contractor shall, unless otherwise indicated on the Plans or as directed by Engineer, install all gas pipes and associated facilities by direct burial.
- B. Direct burial of the gas pipes and associated facilities shall include, but not be limited to: clearing and grubbing, trench excavation (trenching), rock excavation (as required), trench stabilization (as required), lowering and laying pipe and backfilling, as described herein.
- C. Trenching
 - 1. Trenching shall include all excavation necessary to prepare the ditch for the pipe to be installed regardless of what means or methods are necessary to produce such ditch. All trench excavation operations shall be performed in accordance with 29 CFR 1926, Subpart P - Excavations.
 - 2. In cases where the pavement is to be broken, Engineer shall obtain any and all required permits prior to cutting or breaking the pavement. No paved roadways shall be cut without the approval of Engineer. No pavement cuts are included in the project plans.
 - 3. Prior to trenching, the Contractor shall verify the existence, location, elevation and orientation of all underground and aboveground facilities within the vicinity of the WORK, in accordance with 3.1 Location of Other Utilities. The Contractor shall exercise

care in the vicinity of any and all such obstructions. In the event that any such gas lines, water lines, sewer lines, electric lines, cables, conduits, and/or any other existing utility, either above ground or below ground, is damaged by the Contractor during the execution of the Work, the owner of the damaged utility shall be notified immediately. If approved and requested by the owner of the damaged utility, the Contractor shall immediately make the necessary repairs, to the satisfaction of the utility and Engineer.

4. The trench shall be excavated to a depth which will provide the minimum required cover, as specified in 3.4 Required Cover.
5. The maximum width of the trench shall be twenty-four (24) inches plus the nominal pipe diameter, and the minimum width of the trench shall be sixteen (16) inches plus the nominal pipe diameter. Site conditions shall be considered.
6. The trench shall be excavated in a manner which offers smooth, firm and continuous support along the entire length of the pipeline. All sharp objects and debris shall be removed from the trench or the pipe shall be bedded with sand or clean fill to protect the pipe. A minimum of six (6) inches of pipe bedding shall be required in such locations. Where pipe bedding is required, the trench shall be excavated to a depth which will provide the minimum required cover, as specified in 3.4 Required Cover.
7. Whenever wet or otherwise unsuitable material, which is incapable of properly supporting the pipe, as determined by Engineer, is encountered in the trench bottom, such material shall be over-excavated as directed by Engineer to a depth necessary to allow for construction of stable pipe bedding. The over-excavated portion of the trench shall then be backfilled with select fill to proper grade to provide the minimum required cover, as specified in 3.4 Required Cover.

D. Trench Stabilization

1. Where the depth of the trench and/or the type and condition of the soil requires stabilization, the Contractor shall provide a method of trench stabilization. All materials and installation methods required for shoring, sheeting, bracing and any other required means of trench stabilization shall conform to any and all requirements of 29 CFR 1926 and applicable appendices.
2. Trench stabilization system members shall be securely connected together and installed in a manner that prevents sliding, falling, kickouts or other predictable failures of the trench sides. Support systems shall be installed and removed in a manner that protects employees from all forms of trench failure or from being struck by members of the support system.
3. Cross braces installed above the pipe to support the sheeting shall be removed only after pipe embedment has been completed.
4. Where trench sheeting is required to be left in place, such sheeting shall be cut-off at a minimum of three (3) feet below finished grade and the cut-off portion removed from the trench. Sheeting left in place shall not be braced against the pipe, but shall be supported in a manner which will eliminate concentrated loads and horizontal thrusts on the pipe.

E. Lowering and Laying Pipe

1. Belt slings and/or padded calipers which are sized to the particular pipe being laid shall be used to handle the pipe provided such slings or calipers are free of all characteristics which might damage the pipe.

2. Inspection of the trench shall be made by the Contractor prior to lowering the pipe to ensure that no rocks or other sharp objects which may damage the pipe are located within the trench. If found, rocks and/or sharp objects shall be removed from the trench.
3. When piping is lowered into the trench, care shall be exercised to avoid over stressing or buckling the piping or imposing excessive stress on the joints.
4. Anchors and supports shall be provided as directed and where required for fastening WORK into place.
5. Where the Work is suspended, at night or for any other reason, the open ends of the pipe shall be securely plugged, capped, or closed to prevent entrance of water and other foreign material.

F. Backfilling

1. Backfilling operations shall include the furnishing of all labor, materials and equipment necessary for the backfilling and compaction of all trenches, bellholes, and excavations over the entire length of the pipeline, as specified herein.
2. Trenches shall not be backfilled until the pipe has proper cover, bedding and smooth, firm and continuous support along the entire length of the pipe, as specified in *C Trenching*.
3. The trench shall be backfilled as soon as possible after the pipe has been properly placed.
4. Where the trench crosses driveways, roads, streets, or other places used for the travel of vehicles or pedestrians, proper care shall be taken so as not to impede the flow of traffic. All traveled ways, including driveways, walks, streets, or alleys crossed by the trench shall be compacted by mechanical means at +/- 20% of optimum moisture content to 95% of the Modified Proctor Density. Compaction may be verified by Engineer.
5. Unsuitable material encountered during trench excavation shall not be used as backfill. Unsuitable material shall be removed and replaced with select fill, as specified herein.
6. All backfill material shall be free from all objects which might damage the pipe. Wherever it is deemed necessary by Engineer, hand labor shall be used in starting the backfill. The backfill placed from the bottom of the ditch to the top of the pipe shall be placed in the trench simultaneously on both sides of the pipe for the full width of the trench in layers not to exceed six (6) inches in depth. The backfill material shall be thoroughly compacted under and on each side of the pipe to provide solid backing against the external surface of the pipe and to remove all voids. The trench may be backfilled from one foot above the pipe to the top of the trench with mechanical equipment provided the machine is operated parallel to the trench, and the material is placed in the trench in layers not to exceed six inches for the full width.
7. All trenched construction shall be adequately compacted by means of rolling, tamping with mechanical rammers, or hand tamping such that no future settlement of the trench backfill will occur. If vibratory rollers are used for backfill compaction, vibratory motors shall not be activated until at least one (1) foot of backfill has been placed and compacted around the pipe. Flooding shall not be permitted as a means of backfill consolidation. Backfill compaction achieved by means of driving any type of construction equipment and/or vehicles, other than those specifically designed for trench compaction WORK, across any part of the trench shall not be permitted. The CONTRACTOR shall refill and compact backfill areas where settlement occurs.

3.6 STOCKPILES

- A. Stockpiles of satisfactory and unsatisfactory materials shall be placed and graded as specified. Stockpiles shall be kept in a neat and well drained condition, giving due consideration to drainage at all times. The ground surface at stockpile locations shall be cleared, grubbed, and sealed by rubber-tired equipment, excavated satisfactory and unsatisfactory materials shall be separately stockpiled. Stockpiles of satisfactory materials shall be protected from contamination which may destroy the quality and fitness of the stockpiled material.
- B. If the Contractor fails to protect the stockpiles, and any material becomes unsatisfactory, such material shall be removed and replaced with satisfactory material from approved sources at no additional cost to Owner.

3.7 PLASTIC MARKING TAPE

- A. Warning tapes shall be installed directly above the pipe, at a depth of 12 to 18 inches below finished grade unless otherwise shown.

3.8 FIELD DENSITY TESTS

- A. Tests shall be performed as directed by the Engineer. Costs associated with the testing shall be paid by the Owner.

END OF SECTION 315001

SECTION 315010 – HORIZONTAL DIRECTIONAL DRILLING

PART 1 - GENERAL

1.1 SUMMARY

- A. This section covers the installation of the natural gas pipeline by Horizontal Directional Drilling (HDD). HDD is a trenchless excavation method which is accomplished in two phases. The first phase consists of drilling a small diameter pilot hole along a designed directional path. The second phase consists of enlarging the pilot hole to a diameter suitable for installation of the pipe and pulling the pipe into the enlarged hole. HDD is accomplished using a specialized horizontal drilling rig with ancillary tools and equipment.
- B. The grades and radius shown on the Project Plans are for the design presented on the Plans as part of the contract drawings and are intended for reference only. The exact profile of the HDD drill shall be determined by the Contractor based on the entry and exit locations and control point elevation shown on the drawings. The bend radius shown on the drawings are minimums and shall not be reduced. Control point elevations shown indicate the minimum cover and shall not be reduced.

1.2 RELATED DOCUMENTS

- 1. Geotechnical investigations (borings) were conducted near the conceptual HDD sites at the beginning of the Project. The geotechnical bore profiles are included with the Project Plans for reference. The full subsurface *Geotechnical Data Report prepared by S&ME, dated July 28, 2014*, is included in Section W of the Bid Documents as Exhibit 1.
- 2. Section 055110 – Steel Natural Gas Pipeline Construction
- 3. Section 055101 – Natural Gas Pipeline Welding
- 4. Section 017839 – Project Record Documents

1.3 SUBMITTALS

- A. The following shall be submitted in accordance with Section 013300 – Submittal Procedures:
 - 1. SD-06 Drill Path Records
 - a. The Contractor shall provide as-built construction data depicting the entry and exit points and angles, the horizontal and vertical alignment, drilling radius, and minimum cover at control points.
 - b. This information shall be delivered to the Engineer immediately after the HDD has been completed and prior to testing the pipe.
 - 2. Includes submittals required in Section 055110 – Steel Natural Gas Pipeline Construction.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Coated Pipe
 - 1. Abrasion Resistant Over-coated (ARO) pipe will be provided by the Owner for the HDDs.
 - 2. Contractor must supply joint repair materials recommended by the Over-coating manufacturer.
 - 3. Fusion-Bonded Epoxy pipe coating underlies the ARO coating and must be repaired according to the coating manufacturer's recommendations.
 - a. Contractor must also provide materials for the Fusion-Bonded Epoxy coating repair.

PART 3 - EXECUTION

3.1 LOCATION OF OTHER UTILITIES

- A. Engineer assumes no responsibility for the existence and/or location of any other utilities in the Work area. It shall be the responsibility of the Contractor, to investigate and verify the existence and location of all utilities within the vicinity of the Work.
- B. The Contractor shall comply with all the provisions of the North Carolina Excavation Manual. At least seventy-two (72) hours prior to starting the Work the Contractor shall verify the existence and location of all underground utilities, structures and associated appurtenances. The Contractor shall notify the Owner and North Carolina One-Call (811) or (800-632-4949) or through their Website at nc811.org to locate all participating underground utilities. The Contractor shall be responsible for identifying all utilities in the Work area which are not participating members of the one-call system. These utility operators shall be provided with a minimum seventy-two (72) hour notice to have their facilities located prior to starting the WORK.
- C. The excavation of test holes is be required by the Contractor to ascertain the existence, location, size, type, and alignment of existing utilities or underground structures to be crossed by the proposed HDD drill path. The dimensions of these test holes shall be the minimum required to effectively locate said utilities and underground structures.
- D. Positively locate and stake all existing lines, cables, or other underground facilities including exposing facilities that are located within 10 feet of the designed drilled path.
- E. In the event that any gas lines, water lines, sewer lines, electric lines, cables, conduit, and/or any other existing utility, either underground or above ground, are damaged by the Contractor during the execution of the Work, the owner of the damaged utility shall be notified immediately. If approved and/or requested by the owner of the damaged utility, the Contractor shall immediately make the necessary repairs, to the satisfaction of the utility and Engineer.

- F. The Contractor shall be responsible for locating all underground facilities regardless of the ENGINEER's previous efforts in this regard. The Contractor shall be responsible for all losses and repairs occasioned by damage to underground facilities resulting from drilling operations.

3.2 HANDLING PIPE

- A. The Contractor shall at all times handle the steel pipe in a manner that does not overstress the pipe. Vertical and horizontal curves shall be limited so that wall stresses do not exceed 0.50 of the yield stress. If the pipe is buckled or otherwise damaged as determined by the Engineer, the damaged section shall be removed and replaced by the Contractor at his expense.

3.3 REQUIRED CLEARANCE

- A. Regardless of the method of installation, whether by open trench, HDD, or boring, all gas mains shall be installed such that a minimum of twenty-four (24) inches, or as otherwise specified by the Engineer, horizontal and vertical clearance is maintained from all other existing underground utilities and/or structures, thereby permitting proper routine maintenance and protection against damage which may result from proximity to the utilities and/or structures.

3.4 ALIGNMENT – DIRECTIONAL TOLLERANCE

- A. The pilot hole shall be drilled along the path shown on the plan and profile drawing to the tolerances listed in the specifications. However, in all cases, right of way restrictions shall take precedence over the listed tolerances. Regardless of the tolerance achieved, no pilot hole will be accepted if it will result in any or all of the pipeline being installed in violation of right of way restrictions. In all cases, concern for adjacent utilities and/or structures shall take precedence over the listed tolerances. Listing of tolerances does not relieve Contractor from responsibility for safe operations or damage to adjacent utilities and structures.

3.5 INSTALLATION

- A. The Contractor, subject to the requirements of these specifications, will determine the exact method and techniques for completing the HDD crossings. Excavated mud pits constructed in the entry and exit areas will be limited to the pipe borehole area only.
- B. The Contractor shall obtain water for construction.
- C. All pipe to be installed by HDD method shall have 100% of weld joints radiographically tested (x-rayed) prior to coating repair and installation.

3.6 CONSTRUCTION LAYOUT

- A. The Engineer shall provide an experienced surveyor to locate the positions of the entry and exit pits, establish elevation and horizontal datum for the borehead control, and layout the pipe assembly area.

3.7 OVERPULLING

- A. After the steel pipe has been pulled into the reamed pilot hole, the pipe shall be pulled through so that a minimum of 10 feet of steel pipe is exposed at the end of the bore. The pipe shall be cleaned so that the exterior coating can be examined for damage.

3.8 HANDLING DRILLING MUD AND CUTTINGS

- A. During the HDD operations, the Contractor shall make adequate provisions for handling any muddy water, drilling mud, or cuttings. These contaminants shall not be discharged into waterways. When the Contractor's provisions for storing muddy water, drilling mud, or cuttings onsite are exceeded, the contaminants must be hauled away to a suitable legal disposal site. After completion of the directional drilling WORK, the entry and exit pit location shall be restored to their original conditions.
- B. The Contractor shall comply with all provisions of any permits.
- C. To the extent practical, the Contractor shall maintain a closed-loop drilling fluid system and a drilling fluid cleaning system that will allow return fluid to be reused.

3.9 REAM AND PULL BACK

- A. Pre-reaming
 - 1. Pre-reaming operations shall be conducted at the discretion of the Contractor. All provisions of this Specification relating to simultaneous reaming and pulling back operations shall also pertain to pre-reaming operations.
- B. Pulling Loads
 - 1. The maximum allowable tensile load imposed on the pull section shall be equal to 90% of the specified minimum yield strength of the pipe inclusive of a 0.72 code design factor minus the tensile stress resulting from the bend radius, applied across the area of the pipe section.
 - a. Refer to the HDD profiles on the Project Plans for the maximum allowable pulling loads for the drill designs shown.
 - 2. A swivel shall be used to connect the pull section to the reaming assembly to minimize torsional stress imposed on the section.
 - 3. The pull section shall be supported on rollers as it proceeds during pull back so that it moves freely and the pipe and corrosion coating are not damaged.

4. The pull section shall be installed in the reamed hole in such a manner that external pressures are minimized. Any damage to the pipe resulting from external pressure during installation shall be the responsibility of the Contractor.
5. Buoyancy modification shall be used at the discretion of the Contractor. Any buoyancy modification procedure proposed for use shall be submitted to Engineer for approval. The Contractor is responsible for any damage to the pull section resulting for buoyancy modification.

3.10 COATING INSPECTION

1. The pull section is dual coated for corrosion control and coating protection purposes and shall be inspected for holidays with a holiday detector as it enters the hole. Any coating damage found shall be repaired. Inspection and repair of pipe coating shall be conducted in accordance with the applicable Specifications.

3.11 DRILLING FLUIDS

1. No fluid will be utilized that does not comply with environmental regulations.
2. The Contractor is responsible for obtaining, transporting, and storing any water required for drilling fluids.
3. The Contractor shall maximize recirculation of drilling fluid surface returns. The Contractor shall provide solids control and fluid cleaning equipment of a configuration and capacity that can process surface returns and produce drilling fluid suitable for reuse.
4. Disposal of excess drilling fluids is the responsibility of the Contractor and shall be conducted in compliance with all environmental regulations, right-of-way and workspace agreements, and permit requirements. Drilling fluid disposal procedures proposed for use shall be submitted to the Engineer for approval.
5. The Contractor shall employ his best efforts to maintain full annular circulation of drilling fluids. Drilling fluid returns at locations other than the entry and exit points shall be minimized. In the event that annular circulation is lost, the Contractor shall take steps to restore circulation. If inadvertent surface returns of drilling fluids occur, they shall be immediately contained with hand placed barriers (i.e. hay bales, sand bags, silt fences, etc.) and collected using pumps as practical. If the amount of the surface return is not great enough to allow practical collection, the affected area shall be diluted with fresh water and the fluid will be allowed to dry and dissipate naturally. If the amount of the surface return exceeds that which can be contained with hand placed barriers, small collection sumps (less than 5 cubic yards) may be used. If the amount of the surface return exceeds that which can be contained and collected using small sumps, drilling operations shall be suspended until surface return volumes can be brought under control.

3.12 NORTH CAROLINA SPECIAL PROVISIONS – DIRECTIONAL BORING

- A. Directional drilling methods have not been given statewide approval for use on NCDOT right of way. Under no condition shall jetting alone or wet boring with water of utility pipelines be allowed. Directional boring using jetting with a Bentonite (or equivalent material) slurry is approved at a minimum depth of ten (10) feet below the pavement surface [fifteen (15') feet

below the surface of partial and/or full control of access roads] and two (2) feet below any ditch line.

- B. Directional boring is not allowed in embankment material. Directional boring is allowed beneath embankment material in naturally occurring soil. 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.
- C. All directional bores shall maintain ten (10) feet minimum (clear) horizontal distance from the nearest part of any structure, including but not limited to bridges, footings, pipe culverts or box culverts. All directional bores shall maintain ten (10) feet minimum (clear) vertical distance from the nearest part of pipe culverts or box culverts. Directional bores are not allowed beneath bridge footings, culvert wing wall footings or retaining walls.
- D. The tip of the drill string shall have a cutter head. Detection wire shall be installed with non-ferrous material. *(Not applicable to this Project.)*
- E. Any changes shall be submitted to the District Engineer for approval prior to construction.
- F. For multiple conduit installations (including perpendicular & parallel installations), install conduits with five (5) feet minimum (clear) horizontal separation between each conduit or install multiple conduits within a single duct. *(Not applicable to this Project.)*
- G. An overbore shall not be more than two (2") inches greater than the diameter of the pipe or encasement. An overbore exceeding two (2") inches greater than the diameter of the pipe or encasement will 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 two (2") inches of the diameter of the pipe or encasement will arch and no damage will be done to the pavement or sub-grade.
 - 1. Bores are designed with overbore two pipe sizes larger than pipe size. Including the 12 mils minimum Epoxy-Concrete pipe coating, there are approximately 3.3 inches difference in diameter of the hole and the pipe. Settlement calculations have been provided with the NCDOT Encroachment applications.
 - 2. Should Contractor change overbore size, Contractor must have the change approved by NCDOT and provide all necessary calculations for obtaining the approval.
- H. 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. *(Not applicable to this Project.)*

END OF SECTION 315001

SECTION 315050 – JACKING AND BORING

PART 1 - GENERAL

1.1 SUMMARY

- A. This section covers the installation of the natural gas pipeline by the trenchless method of simultaneously jacking or pushing the pipe while maintaining the cutting head of the bore inside of the leading edge of the jacked pipe. This method applies to installation of casing pipe or steel carrier pipe. This specification specifically applies to the installation of steel gas main under a North Carolina Secondary Roadway by the method of jacking and boring without casing.
- B. The grades and bore depth shown on the Project Plans are for the design presented on the Plans as part of the contract drawings and are intended for reference only. The exact depth of the bore shall be determined by the Contractor based on the entry and exit locations and the verified depth of existing utilities along the roadway being crossed with the bore.
- C. RELATED DOCUMENTS
 - 1. Geotechnical investigations (borings) were conducted near the conceptual crossing site. The geotechnical bore profiles are included with the Project Plans for reference. The full subsurface Geotechnical Data Report prepared by S&ME, dated July 28, 2014, is included in Section W of the Bid Documents as Exhibit 1.
 - 2. Section 055110 – Steel Natural Gas Pipeline Construction
 - 3. Section 055101 – Natural Gas Pipeline Welding
 - 4. Section 017839 – Project Record Documents
- D. Contractor's bid price includes the price for delivering a completed jack and bore crossing regardless of number of attempts or method of crossing.

1.2 SUBMITTALS

- A. The following shall be submitted in accordance with Section 013300 – Submittal Procedure:
 - 1. Crossing schedule – shall be submitted to the Engineer a minimum of 48 hours in advance of the planned start of the jack and bore operations.
 - 2. SD-06 Crossing Records
 - a. The Contractor shall provide as-built construction data depicting the entry and exit points and angles (if any), the horizontal and vertical alignment, location of existing crossed utilities as determined from test holes, minimum clearance between bored carrier pipe and existing crossed utilities, and cover at road ditch lines, pavement edges, and the center of pavement.
 - b. This information shall be delivered to the Engineer immediately after the HDD has been completed and prior to testing the pipe.
 - 3. Includes submittals as in Section 055110 – Natural Gas Steel Pipeline Construction.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Coated Pipe
 - 1. Abrasion Resistant Over-coated (ARO) pipe will be provided by the Owner for the HDDs.
 - 2. Contractor must supply joint repair materials recommended by the ARO coating manufacturer.
 - 3. Fusion-Bonded Epoxy (FBE) pipe coating underlies the ARO coating and must be repaired according to the coating manufacturer's recommendations.
 - a. Contractor must also provide materials for the FBE coating repair.

PART 3 - EXECUTION

3.1 LOCATION OF OTHER UTILITIES

- A. Engineer assumes no responsibility for the existence and/or location of any other utilities in the Work area. It shall be the responsibility of the Contractor, to investigate and verify the existence and horizontal and vertical location of all utilities within the vicinity of the WORK.
- B. The Contractor shall comply with all the provisions of the North Carolina Excavation Manual. At least seventy-two (72) hours prior to starting the Work the Contractor shall verify the existence and location of all underground utilities, structures and associated appurtenances. The Contractor shall notify the Owner and **North Carolina One-Call (811) or (800-632-4949) or through their Website at nc811.org** to locate all participating underground utilities. The Contractor shall be responsible for identifying all utilities in the Work area which are not participating members of the one-call system. These utility operators shall be provided with a minimum seventy-two (72) hour notice to have their facilities located prior to starting the Work.
- C. The excavation of test holes is be required by the Contractor to ascertain the existence, location, size, type, and alignment of existing utilities or underground structures to be crossed by the proposed crossing path. The dimensions of these test holes shall be the minimum required to effectively locate said utilities and underground structures.
- D. Positively locate and stake all existing lines, cables, or other underground facilities including exposing facilities that are located within 5 feet of the designed bore path.
- E. In the event that any gas lines, water lines, sewer lines, electric lines, cables, conduit, and/or any other existing utility, either underground or above ground, are damaged by the Contractor during the execution of the Work, the owner of the damaged utility shall be notified immediately. If approved and/or requested by the owner of the damaged utility, the Contractor shall immediately make the necessary repairs, to the satisfaction of the utility and Engineer.

- F. The Contractor shall be responsible for locating all underground facilities regardless of the Engineer's previous efforts in this regard. The Contractor shall be responsible for all losses and repairs occasioned by damage to underground facilities resulting from drilling operations.

3.2 HANDLING PIPE

- A. The Contractor shall at all times handle the steel pipe in a manner that does not overstress the pipe. Vertical and horizontal curves shall be limited so that wall stresses do not exceed 0.50 of the yield stress. If the pipe is buckled or otherwise damaged as determined by the Engineer, the damaged section shall be removed and replaced by the Contractor at his expense.

3.3 REQUIRED CLEARANCE

- A. Regardless of the method of installation, whether by open trench, HDD, or jacking and boring, all gas mains shall be installed such that a minimum of twenty-four (24) inches, or as otherwise specified by the Engineer, horizontal and vertical clearance is maintained from all other existing underground utilities and/or structures, thereby permitting proper routine maintenance and protection against damage which may result from proximity to the utilities and/or structures.

3.4 ALIGNMENT – DIRECTIONAL TOLLERANCE

- A. Vertical and horizontal alignment shall be as near to those depicted on the project Plans as the site conditions permit.
- B. Horizontal alignment shall be as near perpendicular to the centerline of the road as possible.
- C. The horizontal alignment shall be within two feet either direction of the alignment as shown on the Plans depending on conditions at the site at the time of the boring operations.
- D. Vertical alignment shall be as near level as possible considering existing utility locations, bore and receiving pit conditions, and permitted depths of the crossing.
- E. The vertical alignment shall not be less than as shown on the Plans and/or as approved by NCDOT encroachment agreement.

3.5 INSTALLATION

- A. The Contractor, subject to the requirements of these Specifications, will determine the exact method and techniques for completing the jacked and bored crossings. Excavated entry and exit pits will be limited to those required for the jack and bore equipment and for receiving the bored pipe and making tie-ins to the pipeline.
- B. Subsurface geotechnical conditions at the site of the crossing do not favor a successful crossing by horizontal directional drilling (HDD). However, should the Contractor determine through

experience or further investigation that Contractor is confident of making a successful HDD crossing, Contractor may construct crossing with HDD method provided:

1. Contractor provides drill plan to Engineer for approval,
2. Contractor obtains a revised highway encroachment or written approval from the NCDOT for the revised crossing method.
3. Performs the HDD in accordance with Section 315010 – Horizontal Directional Drilling.

- C. The Contractor shall perform the jack and Bore operations as a “dry bore” without adding water.
- D. Prior to commencing jack and bore operations, Contractor shall obtain surveyed elevations of road surface over the centerline of the proposed crossing.
- E. Contractor shall obtain surveyed elevations of the road surface over the centerline of the crossing at the half-way complete point and after completion of the crossing to verify that unacceptable settlement has not occurred.
- F. Should settlement of the surface be noticed during the boring operations, the operations shall be stopped immediately and remedial actions shall be taken to stop the settlement.
 1. As part of the Contractor’s jack and bore plan, Contractor shall have a remedial plan to activate should road settlement occur during the jack and bore operations.
 2. Contractor is responsible for any repair to roadway base and surface required by NCDOT as a result of the jack and bore operations.
- G. A short joint of pipe shall be welded to the nose end of leading joint of carrier pipe. This short joint shall be provided with mechanical arrangements or devices that prevent the auger from leading the crossing pipe during the jack and bore operations. This will help to ensure that the hole remains supported throughout the crossing operations.
- H. All carrier pipe to be installed by the jacking and boring method shall have all weld joint ARO and FBE coating repaired according to the coating manufacturers’ recommendations for field applied joint repair.
 1. Contractor shall install crossing with minimum amount of weld joints.

3.6 CONSTRUCTION LAYOUT

- A. The Contractor shall confine bore pits and equipment layout to within the obtained permanent and temporary easements as shown on the Project Plans.
- B. Contractor shall honor all conditions of the easements as shown on the Project Plans.
- C. Depending upon conditions, contractor should expect the need to dewater bore and receiver pits. Contractor shall provide all materials and equipment associated with dewatering construction excavations.

3.7 OVERJACKING AND COATING INSPECTION

- A. After the steel pipe has been jacked into the hole, the pipe shall be extended beyond the exit hole into the exit pit area so that a minimum of 4 feet of ARO steel carrier pipe is exposed. The pipe shall be cleaned so that the exterior coating can be examined for damage.
- B. Any pipe coating damage shall be discussed with the Engineer to determine the acceptability of the crossing, or necessity for remedial measures.

3.8 HANDLING DRILLING MUD AND CUTTINGS

- A. During the jack and bore operations, the Contractor shall make adequate provisions for handling any muddy water and cuttings. These contaminants shall not be discharged into waterways. When the Contractor's provisions for storing muddy water or cuttings onsite are exceeded, the contaminants must be hauled away to a suitable legal disposal site. After completion of the jack and bore, the entry and exit pit location shall be restored to their original conditions. Cuttings may be used as restoration material provided they meet the requirements for backfill as presented in Section 315001 – Excavation, Trenching and Backfill for Pipeline.
- B. The Contractor shall comply with all provisions of any permits.

END OF SECTION 315050

SECTION 32110 – REGULATOR STATION SITE WORK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Sequencing of Site Work.
 - 2. Excavating and filling for rough grading the Site.
 - 3. Compaction of site
 - 4. Installing stone surface.
- B. Related Requirements:
 - 1. Section 013200 - Construction Progress Documentation.
 - 2. Section 311000 - Site Clearing, for site stripping, grubbing.
 - 3. Section 323113 - Chain Link Fences Dewatering.

1.3 SEQUENCING OF WORK

- A. Regulator sites shall be brought to subgrade before construction of the regulator stations.
- B. Allowance for 6 inches of stone depth shall be considered when setting the station piping to ensure proper height of finished piping above surface grade.
- C. It is suggested that the fencing be installed following testing of the station piping and installation of the meter, control valve and regulators.

1.4 UNIT PRICES

- A. Work of this Section is affected by unit prices for earth moving.

1.5 DEFINITIONS

- A. Backfill: Soil material or controlled low-strength material used to fill an excavation.
 - 1. Initial Backfill: Backfill placed beside and over pipe in a trench, including haunches to support sides of pipe.

- 2. Final Backfill: Backfill placed over initial backfill to fill a trench.
- B. Bedding Course: Aggregate layer placed over the excavated subgrade in a trench before laying pipe.
- C. Borrow Soil: Satisfactory soil imported from off-site for use as fill or backfill.
- D. Excavation: Removal of material encountered above subgrade elevations and to lines and dimensions indicated.
- E. Fill: Soil materials used to raise existing grades.
- F. Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.
- G. Subgrade: Uppermost surface of an excavation or the top surface of a fill or backfill immediately below subbase, drainage fill, drainage course, or topsoil materials.

1.6 ACTION SUBMITTALS

- A. Product Data: For each type of the following manufactured products required:
 - 1. Stone: NCDOT #57.

1.7 QUALITY ASSURANCE

- A. Blasting is not permitted.

1.8 FIELD CONDITIONS

- A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during earth-moving operations.
 - 1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction.
 - 2. Provide alternate routes around closed or obstructed traffic ways if required by Owner or authorities having jurisdiction.
 - 3. Comply with the conditions of the NCDOT Highway Encroachment Agreements.
- B. Do not work on adjoining properties. Confine work to the Site and easements.

PART 2 - PRODUCTS

2.1 SOIL MATERIALS

- A. General: Provide borrow soil materials when sufficient satisfactory soil materials are not available from excavations.
- B. Satisfactory borrow: Sand, sandy loam, low silt content, low or no organic content, free of debris. Soil containing stone and rock smaller than 3 inches is acceptable.
- C. Sand: ASTM C 33/C 33M; fine aggregate.
- D. Stone: NCDOT #57

PART 3 - EXECUTION

3.1 PREPARATION

- A. Protect and maintain erosion and sedimentation controls during earth-moving operations.

3.2 DEWATERING

- A. Prevent surface water and ground water from entering excavations, from ponding on prepared subgrades, and from flooding Project site and surrounding area.
- B. Protect subgrades from softening, undermining, washout, and damage by rain or water accumulation.
 - 1. Reroute surface water runoff away from excavated areas. Do not allow water to accumulate in excavations. Do not use excavated trenches as temporary drainage ditches.

3.3 EXPLOSIVES

- A. Explosives: Do not use explosives.

3.4 EXCAVATION FOR STRUCTURES

- A. Excavate to indicated elevations and dimensions within a tolerance of plus or minus 1 inch (25 mm).
 - 1. Excavations for Footings and Foundations: Do not disturb bottom of excavation. Excavate by hand to final grade just before placing concrete reinforcement. Trim bottoms to required lines and grades to leave solid base to receive other work.

3.5 EXCAVATION FOR STONE YARDS

- A. Excavate surfaces under stone yards to indicated lines, elevations, and subgrades.

3.6 EXCAVATION FOR UTILITY TRENCHES

- A. Excavate trenches to indicated depths and elevations.
- B. Trench Bottoms: Excavate trenches 4 inches (100 mm) deeper than bottom of pipe and conduit elevations to allow for bedding course. Hand-excavate deeper for bells of pipe.
- C. Conduit trenches and placement to be determined by the Owner at the site.

3.7 SUBGRADE INSPECTION

- A. Notify Engineer when excavations have reached required subgrade.
- B. Authorized additional excavation and replacement material will be paid for according to Contract provisions for unit prices.

3.8 STORAGE OF SOIL MATERIALS

- A. Stockpile borrow soil materials and excavated satisfactory soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
 - 1. Stockpiling soil materials at the site is a short term condition; however, stock piles shall be surrounded with silt fencing if they remain on site for more than two days or if a rain event is expected.

3.9 BACKFILL

- A. Place and compact backfill in excavations promptly, but not before completing the following:
 - 1. Construction below finish grade.
 - 2. Surveying locations of underground utilities for Record Documents.
 - 3. Testing and inspecting underground utilities.
 - 4. Removing concrete formwork.
 - 5. Removing trash and debris.
 - 6. Removing temporary shoring, bracing, and sheeting.

3.10 UTILITY TRENCH BACKFILL

- A. Place backfill on subgrades free of mud, frost, snow, or ice.

- B. Place and compact bedding course on trench bottoms and where indicated. Shape bedding course to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits.
- C. Initial Backfill:
 - 1. Soil Backfill: Place and compact initial backfill of satisfactory soil or sand, free of rocks, stones and/or abrasive particles to a height of 12 inches (300 mm) over the pipe or conduit.
 - a. Carefully compact initial backfill under pipe haunches and compact evenly up on both sides and along the full length of piping or conduit to avoid damage or displacement of piping or conduit.
- D. Final Backfill:
 - 1. Soil Backfill: Place and compact backfill in 6-inch lifts of satisfactory soil to final subgrade elevation.
- E. Warning Tape: Install warning tape directly above utilities, 12 to 18 inches below finished grade.

3.11 SOIL FILL

- A. Plow, scarify, bench, or break up sloped surfaces steeper than 1 vertical to 4 horizontal so fill material will bond with existing material.

3.12 COMPACTION OF SOIL BACKFILLS AND FILLS

- A. Place backfill and fill soil materials in layers not more than 6 inches in loose depth for material compacted by heavy compaction equipment or compacted by hand-operated tampers.

3.13 GRADING

- A. General: Uniformly grade areas to a smooth surface, free of irregular surface changes. Comply with compaction requirements and grade to lines, and elevations indicated.
 - 1. Provide a smooth transition between adjacent existing grades and new grades.
 - 2. Cut out soft spots, fill low spots, and trim high spots to comply with required surface tolerances.

3.14 FIELD QUALITY CONTROL

- A. Special Inspections: Owner will engage a qualified inspector to perform the following special inspections:

1. Determine prior to placement of fill that site has been prepared in compliance with requirements.
2. Determine that fill material classification and maximum lift thickness comply with requirements.
3. Determine, during placement and compaction that in-place density of compacted fill complies with requirements.

3.15 PROTECTION

- A. Protecting Graded Areas: Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.
- B. Repair and reestablish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction due to subsequent construction operations or weather conditions.
 1. Scarify or remove and replace soil material to depth as directed by Architect; reshape and recompact.
- C. Where settling occurs before Project correction period elapses, remove finished surfacing, backfill with additional soil material, compact, and reconstruct surfacing.
 1. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to greatest extent possible.

3.16 DISPOSAL OF SURPLUS AND WASTE MATERIALS

- A. Remove surplus satisfactory soil and waste materials, including unsatisfactory soil, trash, and debris, and legally dispose of them off-Site.

END OF SECTION 312000

SECTION 321216 - ASPHALT PAVING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Project Plans and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
- B. References
 - 1. A. NCDOT – Roadway Design Manual (current addition)
 - a. <https://connect.ncdot.gov/projects/Roadway/Pages/Roadway-Design-Manual.aspx>
 - 2. B. NCDOT – Standard Specifications and Special Provisions (current addition)
 - a. https://connect.ncdot.gov/resources/Specifications/Pages/Specifications-and-Special-Provisions.aspx?&&p_SortBehavior=0&p_Prov_x002e__x0020_No_x002e_=Z&p_FileLeafRef=Z087.docx&&PageFirstRow=1&&View={985E66E2-CE2E-4692-8C99-36680D3CE545}
 - 3. C. City of Greenville Manual of Standard Designs and Details (current addition)
 - a. https://connect.ncdot.gov/resources/Specifications/Pages/Specifications-and-Special-Provisions.aspx?&&p_SortBehavior=0&p_Prov_x002e__x0020_No_x002e_=Z&p_FileLeafRef=Z087.docx&&PageFirstRow=1&&View={985E66E2-CE2E-4692-8C99-36680D3CE545}

1.2 SUMMARY

- A. Section Includes:
 - 1. Hot-mix asphalt paving.
 - 2. Asphalt surface treatments.
- B. Paving is for existing stone entrance to the electric substations north of MacGregor Downs Road and is required by NCDOT as part of the ROW encroachment agreement.

1.3 UNIT PRICES

- A. Work of this Section is included in unit bid prices and includes all labor and materials.

1.4 PREINSTALLATION MEETINGS

- A. Notify Mr. F. Durward Tyson, Jr., P.E. of Greenville Utilities Commission at (252) 551-2048 ten (10) days prior to paving operations.

- B. Coordinate paving operations so as to minimize disruption to access to the electric substations.

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Job-Mix Designs: Acceptable as NCDOT approved SM-9.5B Asphalt mix

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For manufacturer.
- B. Material Certificates: For paving material.

1.7 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Pavement manufacturers shall be approved by the NCDOT for manufacturing the types of pavement proposed for the site. The concrete and/or asphalt mixtures proposed must be approved for the intended use and installation conditions by the NCDOT.

1.8 FIELD CONDITIONS

- A. Follow manufacturer's recommendations and NCDOT standards.

PART 2 - PRODUCTS

2.1 AGGREGATES

- A. Meet the requirements of NCDOT SM-9.5B light duty asphalt pavement

2.2 ASPHALT MATERIALS

- A. Meet the requirements of NCDOT SM-9.5B light duty asphalt pavement
- B. Water: Potable.

2.3 AUXILIARY MATERIALS

- A. Joint Sealant: NCDOT approved.

2.4 MIXES

- A. Meeting all requirements of **NCDOT S-9.5B**

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that subgrade is dry and in suitable condition to begin paving.
- B. Contractor shall ensure adequate compaction is achieved and that the prescribed pavement or surface treatment including base courses are installed according to the manufacturer's recommendations and NCDOT standards
- C. Proceed with paving only after unsatisfactory conditions have been corrected.

3.2 SURFACE PREPARATION

- A. General: Immediately before placing asphalt materials, remove loose and deleterious material from substrate surfaces. Ensure that prepared subgrade is ready to receive paving.
- B. Herbicide Treatment: Apply herbicide according to manufacturer's recommended rates and written application instructions. Apply to dry, prepared subgrade or surface of compacted-aggregate base before applying paving materials.
 - 1. Mix herbicide with prime coat if formulated by manufacturer for that purpose.

3.3 PLACING HOT-MIX ASPHALT

- A. Machine place hot-mix asphalt on prepared surface, spread uniformly, and strike off. Place asphalt mix by hand in areas inaccessible to equipment in a manner that prevents segregation of mix. Place each course to required grade, cross section, and thickness when compacted.
 - 1. Place hot-mix asphalt surface course in single lift.
 - 2. Spread mix at a minimum temperature of 250 deg F (121 deg C).
 - 3. Begin applying mix along centerline of crown for crowned sections and on high side of one-way slopes unless otherwise indicated.
 - 4. Regulate paver machine speed to obtain smooth, continuous surface free of pulls and tears in asphalt-paving mat. (as applicable)
- B. Place paving in consecutive strips not less than 10 feet (3 m) wide unless infill edge strips of a lesser width are required.
 - 1. After first strip has been placed and rolled, place succeeding strips and extend rolling to overlap previous strips. Overlap mix placement about 1 to 1-1/2 inches (25 to 38 mm) from strip to strip to ensure proper compaction of mix along longitudinal joints.

- C. Promptly correct surface irregularities in paving course behind paver. Use suitable hand tools to remove excess material forming high spots. Fill depressions with hot-mix asphalt to prevent segregation of mix; use suitable hand tools to smooth surface.

3.4 JOINTS

- A. Construct joints to ensure a continuous bond between adjoining paving sections. Construct joints free of depressions, with same texture and smoothness as other sections of hot-mix asphalt course.
 - 1. Clean contact surfaces and apply tack coat to joints.
 - 2. Compact joints as soon as hot-mix asphalt will bear roller weight without excessive displacement.

3.5 COMPACTION

- A. General: Begin compaction as soon as placed hot-mix paving will bear roller weight without excessive displacement. Compact hot-mix paving with hot, hand tampers or with vibratory-plate compactors in areas inaccessible to rollers.
 - 1. Complete compaction before mix temperature cools to 185 deg F (85 deg C).
- B. Breakdown Rolling: Complete breakdown or initial rolling immediately after rolling joints and outside edge. Examine surface immediately after breakdown rolling for indicated crown, grade, and smoothness. Correct laydown and rolling operations to comply with requirements.
- C. Intermediate Rolling: Begin intermediate rolling immediately after breakdown rolling while hot-mix asphalt is still hot enough to achieve specified density. Continue rolling until hot-mix asphalt course has been uniformly compacted to the following density:
 - 1. Average Density: 96 percent of reference laboratory density according to NCDOT recommendations.
- D. Finish Rolling: Finish roll paved surfaces to remove roller marks while hot-mix asphalt is still warm.
- E. Edge Shaping: While surface is being compacted and finished, trim edges of pavement to proper alignment. Bevel edges while asphalt is still hot; compact thoroughly.
- F. Repairs: Remove paved areas that are defective or contaminated with foreign materials and replace with fresh, hot-mix asphalt. Compact by rolling to specified density and surface smoothness.
- G. Protection: After final rolling, do not permit vehicular traffic on pavement until it has cooled and hardened.

- H. Erect barricades to protect paving from traffic until mixture has cooled enough not to become marked.

3.6 INSTALLATION TOLERANCES

- A. Pavement Thickness: Compact each course to produce the thickness indicated within the following tolerances:
 - 1. Single Course: Plus or minus 1/4 inch (6 mm).
- B. Pavement Surface Smoothness: Compact each course to produce a surface smoothness that matches the grade of the existing driveway and smoothly matches the road grade at the drive entrance.

3.7 SURFACE TREATMENTS

- A. Not applicable.

3.8 FIELD QUALITY CONTROL

- A. Mix records.
- B. Manufacturer's installation recommendations.
- C. Inspector observation.

3.9 WASTE HANDLING

- A. General: Handle asphalt-paving waste according to approved waste management plan required in Section 017419 - Construction Waste Management and Disposal.

END OF SECTION 321216

SECTION 323113 - CHAIN LINK FENCES AND GATES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
- B. References:
 - 1. ASTM F567-14a – Standard Specification for Installation of Chain Link Fence
 - 2. ASTM F1184-05 (2010) – Standard Specification for Industrial and Commercial Horizontal slide Gates
 - 3. ASTM F1043-14 – Standard Specification for Strength and Protective Coatings on Steel Industrial fence Framework
 - 4. ASTM A123/A123M-13 – Standard Specification for Zinc (hot-Dip Galvanized) coatings on Iron and Steel Products
 - 5. ASTM F900 – Standard Specification for Industrial and Commercial Swing Gates

1.2 SUMMARY

- A. The work in this section shall include furnishing all labor, materials, and equipment necessary to complete all chain link fencing, swing gates, and cantilevered slide gate(s) required for this project in accordance with this specification section and the Project Plans.
- B. Section Includes:
 - 1. Chain-link fences.
 - 2. Gates: 3-foot wide swing gates and 12-foot slide gates (two required for each 12-foot opening).
- C. Related Sections:
 - 1. Section 033000 - Cast-in-Place Concrete, for cast-in-place concrete post footings.
 - 2. Section 321100 – Regulator Station Site Work

1.3 PERFORMANCE REQUIREMENTS

- A. Fencing posts shall conform to: Material Group: IA, ASTM F 1043, Schedule 40 steel pipe (galvanized).
- B. Structural Performance: Must be able to withstand normal wind loads for the area and regular operation of gates during service and maintenance operations.

- C. Lightning Protection System: Maximum grounding-resistance value of 25 ohms under normal dry conditions.
- D. Gates must be secure and lockable with chain and lock.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated include construction details, material descriptions, dimensions of individual components and profiles, and finishes for chain-link fences and gates.
 - 1. Fence and gate posts, rails, and fittings.
 - 2. Chain-link fabric, reinforcements, and attachments.
 - 3. Accessories
 - 4. Gates and hardware.
 - 5. Shop drawings

1.5 SUBMITTALS

- A. Warranty: Sample of special warranty.

1.6 PROJECT CONDITIONS

- A. Field Measurements: Verify layout information for chain-link fences and gates shown on Plans in relation to property survey and existing structures. Verify layout and dimensions by field measurements and/or survey.

1.7 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which Installer agrees to repair or replace components of chain-link fences and gates that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Faulty operation of gate latches,
 - b. Faulty operation of gate hangers and rollers, and
 - c. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
 - 2. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 CHAIN-LINK FENCE FABRIC

- A. General: Provide fabric in one-piece heights measured between top and bottom of outer edge of selvage knuckle or twist. Comply with CLFMI Product Manual and with requirements indicated below:
1. Fabric Height: 8 Feet, as indicated on Drawings.
 2. Steel Wire Fabric: Wire with a diameter of 0.192 inch (4.88 mm).
 - a. Mesh Size: 2-1/8 inches (54 mm).
 - b. Zinc-Coated Fabric: ASTM A 392-11a, Type II, Class 1, 1.2 oz./sq. ft. (366 g/sq. m) with zinc coating applied before weaving.
 3. Selvage: Knuckled at both selvages.

2.2 FENCE FRAMING

- A. Posts and Rails: Comply with ASTM F 1043 for framing, including rails, braces, and line; terminal; and corner posts. Provide members with minimum dimensions and wall thickness according to ASTM F 1043 based on the following:
1. Fence Height: 8 feet, as indicated on Drawings.
 2. Heavy Industrial Strength: WT-40, Material Group IC, AASHTO M181, round steel fence pipe, electric-resistance-welded pipe.
 - a. Line Post: 3.500 inches in diameter, 0.160 inch wall thickness
 - b. End, Corner and Pull Post: 4.0 inches in diameter, 0.160 inch all thickness
 3. Horizontal Framework Members: Intermediate top and bottom rails complying with ASTM F 1043, WT-40.
 - a. Top, intermediate and bottom rails: 2.875 inches in diameter, 0.160 inch wall thickness.
 4. Brace Rails: Comply with ASTM F 1043.
 5. Metallic Coating for Steel Framing:
 - a. Type A, consisting of not less than minimum 2.0-oz./sq. ft. (0.61-kg/sq. m) average zinc coating per ASTM A 123/A 123M

2.3 TENSION WIRE

- A. Metallic-Coated Steel Wire: 0.177-inch- (4.5-mm-) diameter, marcelled tension wire complying with ASTM A 817 and ASTM A 824, with the following metallic coating:

1. Type II, zinc coated (galvanized) by electrolytic process, with the following minimum coating weight:
 - a. Matching chain-link fabric coating weight.

2.4 SWING GATES

- A. General: Comply with ASTM F 900 for gate posts and single swing gate.
 1. Gate Leaf Widths: 36 inches
 2. Gate Fabric Height: As indicated on the Plans, 8 feet.
- B. Pipe and Tubing:
 1. Zinc-Coated Steel: Comply with ASTM F 1043 and ASTM F 1083; protective coating and finish to match fence framing.
 2. Gate Posts: Round tubular steel.
 3. Gate Frames and Bracing: Round tubular steel.
- C. Frame Corner Construction: Welded or assembled with corner fittings.
- D. Hardware:
 1. Hinges: 180-degree outward swing.
 2. Latches permitting operation from both sides of gate with provision for padlocking accessible from both sides of gate.
 3. Padlock and Chain: *Owner furnished*.

2.5 SLIDE GATES

- A. General: Comply with ASTM F 1184-02 (2010) for Standard Specifications for Industrial and Commercial Horizontal Slide Gates (Cantilever type).
 1. Gate Leaf Widths: 144 inches (12 feet); 2 required for each 12-foot opening.
 - a. Assumes a counter-balance section equal to the cantilever section. Follow manufacturer's recommendations on the counter-balance section length to a minimum of 50% of opening width.
 2. Gate Fabric Height: As indicated on the Plans, 8 feet.
- B. Pipe and Tubing
 1. Zinc-Coated Steel: Comply with ASTM F 1043 and ASTM F 1083; protective coating and finish to match fence framing.
 2. Gate Posts: Round tubular steel.
 3. Gate Frames and Bracing: Round tubular steel.
- C. Frame Corner Construction: Welded or assembled with corner fittings.
- D. Hardware:

1. Latches permitting operation from both sides of gate with provision for padlocking accessible from both sides of gate.
2. Latches shall provide secure gate closure from top to bottom.
3. Padlock and Chain: *Owner furnished*.

2.6 ANCHORING CEMENT

- A. Erosion-Resistant Anchoring Cement: Factory-packaged, nonshrink, nonstaining, hydraulic-controlled expansion cement formulation for mixing with potable water at Project site to create pourable anchoring, patching, and grouting compound. Provide formulation that is resistant to erosion from water exposure without needing protection by a sealer or waterproof coating and that is recommended in writing by manufacturer, for exterior applications.

2.7 FENCE GROUNDING

- A. Conductors: Bare, solid wire for No. 6 AWG and smaller; stranded wire for No. 4 AWG and larger.
 1. Material above Finished Grade: Copper.
 2. Material on or below Finished Grade: Copper.
 3. Bonding Jumpers: Braided copper tape, 1 inch (25 mm) wide, woven of No. 30 AWG bare copper wire, terminated with copper ferrules.
- B. Connectors and Grounding Rods: Comply with UL 467.
 1. Connectors for Below-Grade Use: Exothermic welded type.
 2. Grounding Rods: Copper-clad steel, 5/8 by 96 inches (16 by 2440 mm).

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas and conditions, with Installer present, for compliance with requirements for a verified survey of property lines and legal boundaries, site clearing, earthwork, pavement work, and other conditions affecting performance of the Work.
 1. Do not begin installation before final grading is completed.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Stake locations of fence lines, gates, and terminal posts.

3.3 INSTALLATION, GENERAL

- A. Install chain-link fencing to comply with ASTM F 567 and more stringent requirements indicated.
 - 1. Install fencing on established boundary lines inside property line.

3.4 CHAIN-LINK FENCE INSTALLATION

- A. Post Excavation: Drill or hand-excavate holes for posts to diameters and spacings indicated, in firm, undisturbed soil.
- B. Post Setting: Set posts in concrete at indicated spacing into firm, undisturbed soil.
 - 1. Verify that posts are set plumb, aligned, and at correct height and spacing, and hold in position during setting with concrete or mechanical devices.
 - 2. Concrete Fill: Place concrete around posts to dimensions indicated and vibrate or tamp for consolidation. Protect aboveground portion of posts from concrete splatter.
- C. Terminal Posts: Locate terminal end, corner, and gate posts per ASTM F 567 and terminal pull posts at changes in horizontal or vertical alignment.
- D. Line Posts: Space line posts uniformly at 96 inches (2440 mm) o.c. or less to achieve even spacing along lot sides.
- E. Post Bracing and Intermediate Rails: Install according to ASTM F 567, maintaining plumb position and alignment of fencing. Diagonally brace terminal posts to adjacent line posts with truss rods and turnbuckles. Install braces at end and gate posts and at both sides of corner and pull posts.
 - 1. Locate horizontal braces at midheight of fabric on fences with top rail. Install so that posts are plumb when diagonal rod is under proper tension.
- F. Tension Wire: Not required.
- G. Top Rail: Install according to ASTM F 567, maintaining plumb position and alignment of fencing. Run rail continuously through line post caps, bending to radius for curved runs and terminating into rail end attached to posts or post caps fabricated to receive rail at terminal posts. Provide expansion couplings as recommended in writing by fencing manufacturer.
- H. Intermediate and Bottom Rails: Install and secure to posts with fittings.
- I. Chain-Link Fabric: Apply fabric to outside of enclosing framework. Leave 1 inch (25.4 mm) between finish grade or surface and bottom selvage unless otherwise indicated. Pull fabric taut and tie to posts, rails, and tension wires. Anchor to framework so fabric remains under tension after pulling force is released.

- J. Tension or Stretcher Bars: Thread through fabric and secure to end, corner, pull, and gate posts with tension bands spaced not more than 15 inches (380 mm) o.c.
- K. Tie Wires: Use wire of proper length to firmly secure fabric to line posts and rails. Attach wire at one end to chain-link fabric, wrap wire around post a minimum of 180 degrees, and attach other end to chain-link fabric per ASTM F 626. Bend ends of wire to minimize hazard to individuals and clothing.
 - 1. Maximum Spacing: Tie fabric to line posts at 12 inches (300 mm) o.c. and to braces at 24 inches (610 mm) o.c.
- L. Fasteners: Install nuts for tension bands and carriage bolts on the side of the fence opposite the fabric side.

3.5 GATE INSTALLATION

- A. Install gates according to manufacturer's written instructions, level, plumb, and secure for full opening without interference. Attach fabric as for fencing. Attach hardware using tamper-resistant or concealed means. Install ground-set items in concrete for anchorage. Adjust hardware for smooth operation and lubricate where necessary.

3.6 GROUNDING AND BONDING

- A. Fence Grounding: Install at maximum intervals of (minimum of two per station).
 - 1. Gates and Other Fence Openings: Ground fence on each side of opening.
 - a. Bond metal gates to gate posts.
- B. Protection at Crossings of Overhead Electrical Power Lines: Ground fence at location of crossing.
- C. Grounding Method: At each grounding location, drive a grounding rod vertically until the top is 6 inches (150 mm) below finished grade. Connect rod to fence with No. 6 AWG conductor. Connect conductor to each fence component at the grounding location, including the following:
 - 1. Make grounding connections to each barbed wire strand with wire-to-wire connectors designed for this purpose.
 - 2. Make grounding connections to each barbed tape coil with connectors designed for this purpose.
- D. Bonding Method for Gates: Connect bonding jumper between gate post and gate frame.
- E. Connections: Make connections to minimize possibility of galvanic action or electrolysis. Select connectors, connection hardware, conductors, and connection methods so metals in direct contact will be galvanically compatible.
 - 1. Make connections with clean, bare metal at points of contact.

2. Coat and seal connections having dissimilar metals with inert material to prevent future penetration of moisture to contact surfaces.

3.7 FIELD QUALITY CONTROL

- A. Verify proper installation, connections, and operation of all gates and latches.

3.8 ADJUSTING

- A. Gates: Adjust gates to operate smoothly, easily, and quietly, free of binding, warp, excessive deflection, distortion, nonalignment, misplacement, disruption, or malfunction, throughout entire operational range. Confirm that latches and locks engage accurately and securely without forcing or binding.
- B. Lubricate hardware and other moving parts.

END OF SECTION 323113

SECTION 329100 – ROW RESTORATION

PART 1 - GENERAL

- 1.1 Contractor is responsible for restoring the surface to pre-construction contours and restoring vegetation according to the seeding and sodding requirements included in the project plans.
- 1.2 Restoration shall occur in sections that are complete within fourteen (14) days following the restoration of the surface to original contours, removal of construction equipment and debris, and cessation of work in that section of the easement and work space.
 - A. Restoration may not be delayed until after all construction has been completed.
 - B. As the remaining construction progresses, the Contractor shall revisit and inspect previously restored sections of the ROW and install remedial restoration measures as necessary.
- 1.3 EROSION AND SEDIMENT CONTROLS
 - A. The Contractor shall install and maintain the erosion and sediment controls as indicated in the Plans and these Specifications. The Contractor shall install all permanent erosion and sediment control measures such as seeding, mulching and tacking within 14 days following restoration of surface contours, removal of construction equipment and debris, and cessation of work in that section of the easement and work space.
 - B. The Contractor is responsible for maintaining all erosion and sediment control measures during construction until Engineer and the Owner releases the Contractor from this phase of the project. The Owner will then assume the responsibility of maintaining permanent measures and removing temporary measures such as silt fences. The controls and measures required by the Contractor are described below.

PART 2 - PRODUCTS

- 2.1 SEED AND SOD
 - A. The specifications for soil preparation, fertilizing, seeding, mulching, and tacking are included in the Project Plans.

PART 3 - EXECUTION

3.1 RESTORATION

- A. The ROW surface shall be returned to pre-construction contours as soon as the trench line is restored, debris is removed, matting and equipment are removed, and the ROW is no longer required as a construction road to access portions of the ROW with construction in projects or planned.
- B. Seeding and sodding shall occur within fourteen (14) days following restoration.

3.2 MAINTENANCE

- A. The Contractor shall revisit restored portions of the ROW as the Project continues and apply remedial measures to the section of ROW previously restored in order to obtain the cover necessary to prevent erosion to occur.

3.3 INSPECTIONS

- A. General
 - 1. The Contractor shall inspect restored areas of the construction site at least once every fourteen (14) calendar days and within 24 hours of the end of any storm that produces 0.5 inches or more rainfall at the site.
 - 2. The Contractor's is released from their responsibilities for site restoration after Final Acceptance of the Work by the Owner.

END OF SECTION 329100

Exhibit 1: Geotechnical Data Report

Exhibit 1

**Geotechnical Data Report
SECTION 400100**

GEOTECHNICAL DATA REPORT

**US 264 HDD Crossings
Greenville, North Carolina
S&ME Project No. 1358-14-033**

Prepared For:

RK&K
2100 East Cary Street, Suite 209
Richmond, Virginia 23223

Prepared By:



3718 Old Battleground Road
Greensboro, North Carolina 27410
NC PE Firm License No. F-0176

July 28, 2014



July 28, 2014

RK&K
2100 East Cary Street, Suite 209
Richmond, Virginia 23223

Attention: Mr. Martin Rodgers, P.E.

Reference: **GEOTECHNICAL DATA REPORT**
US 264 HDD Crossings
Greenville, North Carolina
S&ME Project No. 1358-14-033

Dear Mr. Rodgers:

S&ME, Inc. (S&ME) has completed field exploration and laboratory testing for the above referenced project. The purpose was to explore and characterize subsurface conditions for use in design and construction of four sections of a directionally drilled pipeline along US 264 between Old River Road and MacGregor Downs Road in Greenville, North Carolina. Our work was performed in general accordance with S&ME Proposal No. 1581-13-P233 dated November 21, 2013 and the terms and conditions of the General Services Agreement between RK&K and S&ME dated June 4, 2010. The project scope was amended during a telephone call on June 27, 2014 between Wayne Noonoo with RK&K and Matt Moler with S&ME to include a total of eight soil test borings to depths of 40 or 50 feet below existing grade.

S&ME appreciates the opportunity to provide geotechnical exploration and testing services for this project. If you have any questions or need additional information in regard to this report, please call us at (336) 288-7180.

Respectfully,
S&ME, Inc.

Matt Moler, P.E.
Senior Engineer/Project Manager



Scott Hancock, P.E.
Technical Principal/Vice President

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FIGURES

Site Vicinity Plan – Figure 1
Boring Location Plans – Figures 2, 4, 6, and 8
Generalized Subsurface Profiles – Figures 3, 5, 7, and 9

APPENDICES

- A Legend to Soil Classification and Symbols
Boring Logs (B-1 through B-8)
- B Summary of Laboratory Test Data
Laboratory Test Results (34 pages)

1.0 PROJECT INFORMATION

Project information was obtained from e-mail correspondence between Martin Rodgers with RK&K and Scott Hancock with S&ME dated November 19, 2013. In the e-mail correspondence, Mr. Rodgers provided a project schedule and requested five boring to depths of 60 feet below existing grade. The project scope was amended during a telephone call on June 27, 2014 between Wayne Noonoo with RK&K and Matt Moler with S&ME to include a total of eight soil test borings to depths of 40 or 50 feet below existing grade.

The proposed construction consists of four sections of horizontal directionally drilled (HDD) pipeline along US 264 between Old River Road and MacGregor Downs Road in Greenville, North Carolina, as shown on Figure 1 (Site Vicinity Plan) in the Appendix. S&ME was requested to perform two borings at each HDD crossing for use in the HDD design by RK&K.

2.0 GEOLOGY

The site is located within the Coastal Plain Physiographic Province of North Carolina. The Coastal Plain Province is typically characterized by marine, alluvial, and eolian sediments that were deposited during periods of fluctuating sea levels and moving shorelines. The soils in this province are typical of those laid down in a shallow sloping near-shore marine environment. Alluvial sands, silts, and clays are typically present near rivers and creeks.

According to the *1985 Geologic Map of North Carolina*, the site is underlain by the Black Creek Formation of the Cretaceous Period. The Black Creek Formation is described as clay, gray to black, lignitic, and contains thin beds and laminae of fine-grained micaceous sand and thick lenses of cross-bedded sand. Glauconitic, fossiliferous clayey sand lenses are located in the upper part of the formation. Borings performed for this exploration did not extend deep enough to encounter the Black Creek Formation.

Based on our experience with HDD and the area geology, we have the following comments relative to HDD natural geologic hazards associated with the subject site:

HDD GEOLOGIC HAZARD	COMMENTS
Cohesionless sand, gravel, cobbles, or boulders with little to no fines.	Zone of clean sands (5% or less passing the No. 200 sieve) encountered sporadically.
Horizontal zones of gravel, cobbles, or boulders in soil matrix.	Inconsistent with site geology.
Near vertical zones of gravel, cobbles, or boulders in soil matrix.	Inconsistent with site geology.
Voids or preferential seepage paths potentially resulting in loss of drilling fluid return.	Inconsistent with site geology.
Very loose sand or very soft silt/clay.	Encountered in several borings at various depths.

Peat, organic soil.	Inconsistent with site geology.
Material with sufficient potential swell upon exposure to water to reduce borehole diameter.	Inconsistent with site geology.
Continuous strata of hard material requiring rock drilling techniques to penetrate.	Inconsistent with site geology.
Artesian groundwater conditions.	Inconsistent with site geology.

3.0 EXPLORATION PROCEDURES

3.1 Field

Eight soil test borings (labeled B-1 through B-8) were conducted at the locations indicated on Figures 2, 4, 6, and 8 (Boring Location Plans). The borings were located roughly parallel to, and offset from, the planned pipeline alignment. Borings B-1 through B-6 were located along US 264, boring B-7 was located within the Greenville Utility right-of-way near the Greenville West 230 Substation, and boring B-8 was located off of MacGregor Downs Road.

The borings were located by S&ME using GPS equipment within the areas requested by RK&K. S&ME provided as-drilled boring coordinates to RK&K, and RK&K provided interpolated ground surface elevations. Subsurface conditions encountered at the boring locations are presented on the Boring Logs in Appendix A. Boring coordinates and ground surface elevations are provided on the Boring Logs and should be considered approximate.

The borings were conducted using a CME 550 drill rig mounted on a rubber-tired all-terrain vehicle. Mud rotary (wash boring) drilling procedures were used to advance the borings to termination depths of 40 or 50 feet. 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.

3.2 Laboratory

Samples were returned to our laboratory where a geotechnical staff professional visually examined each soil sample to assess 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 are presented on the individual Boring Logs included in Appendix A. The contact lines represent approximate boundaries between the soil types. The actual boundaries between the soil types in the field may vary in both the horizontal and vertical directions.

Classification tests were performed on selected soil samples obtained during the field exploration. Laboratory testing included:

- Atterberg Limits (ASTM D 4318)
- Grain Size Distribution (#200 wash) (ASTM D 422)
- Moisture Content (ASTM D 2216)

Results of the laboratory testing are presented in Appendix B. A Summary of Laboratory Test Data table is also included in Appendix B.

4.0 HDD SUBSURFACE CONDITIONS

Subsurface conditions at the four HDD crossings were characterized based on subsurface conditions encountered and geologic setting. Soils with similar HDD drilling characteristics were grouped into strata (as shown in the table below) based on visual soil classification, laboratory classification tests, consistencies inferred from standard penetration resistance values, and geologic origin. Material properties were estimated from correlations to material types, laboratory tests, and field tests. The Strata contacts shown on the Generalized Subsurface Profiles in the Appendix may vary between borings and should be considered approximate. Material properties are provided in tables based on correlations with subsurface conditions encountered. More detailed information is presented in the Appendix.

STRATA	DESCRIPTION	PERCENT OF MATERIAL			USCS	SPT (blows/ft)
		GRAVEL	SAND	SILT/CLAY		
I	COASTAL PLAIN SOILS: Very loose to medium dense SANDS and soft to stiff SILTS	< 1%	35% to 95%	5% to 65%	SP-SM, SP, SC, SM, SC-SM, ML, MH	WOH to 24
II	COASTAL PLAIN SOILS: Medium dense to dense SANDS	< 1%	80% to 95%	5% to 20%	SP-SM, SM	25 to 40
III	COASTAL PLAIN SOILS: High Plasticity CLAY with intermittent silty sand layers, sporadic shells	< 1%	20% to 50%	50% to 80%	CH, SM	2 to 15

Notes:

1. USCS – Unified Soil Classification System, visual classification.
2. SPT – Standard Penetration Test "N" value. Tests performed with an autohammer. WOH – Weight of Hammer.
3. The range of Percentage of Materials was estimated based on lab data.
4. The information presented above is a generalization of predominant subsurface conditions encountered. The material descriptions, percentages of materials, USCS, and SPT values presented are estimated based on visual classification, laboratory testing, field testing, and experience.

Groundwater was encountered in the borings at depths of 2.5 to 16.5 feet below the existing ground surface. These depths correspond to approximate elevations of 11.5 to 77.3 feet. The groundwater level typically fluctuates during the year due to seasonal and climatic changes.

Based on the data obtained during our field and laboratory exploration, we recommend the following parameters for use in design of the HDD program.

Strata	Friction Angle (degrees)	Cohesion (psf)	Unit Weight (pcf)		Shear Modulus (ksf)
			Total	Submerged	
I	28	0	120	58	200
II	32	0	120	58	600
III	10	500	110	48	200

5.0 QUALIFICATIONS

This report has been prepared in accordance with generally accepted geotechnical engineering practice for specific application to this project. The conclusions contained in this report were based on the applicable standards of the engineering profession at the time this report was prepared. No other warranty, express or implied, is made.

The nature and extent of variations between borings may not become evident until construction. If variations appear evident, then it will be necessary to reevaluate the applicability of the information obtained with this exploration and laboratory testing program. Environmental services were beyond the scope of this report.

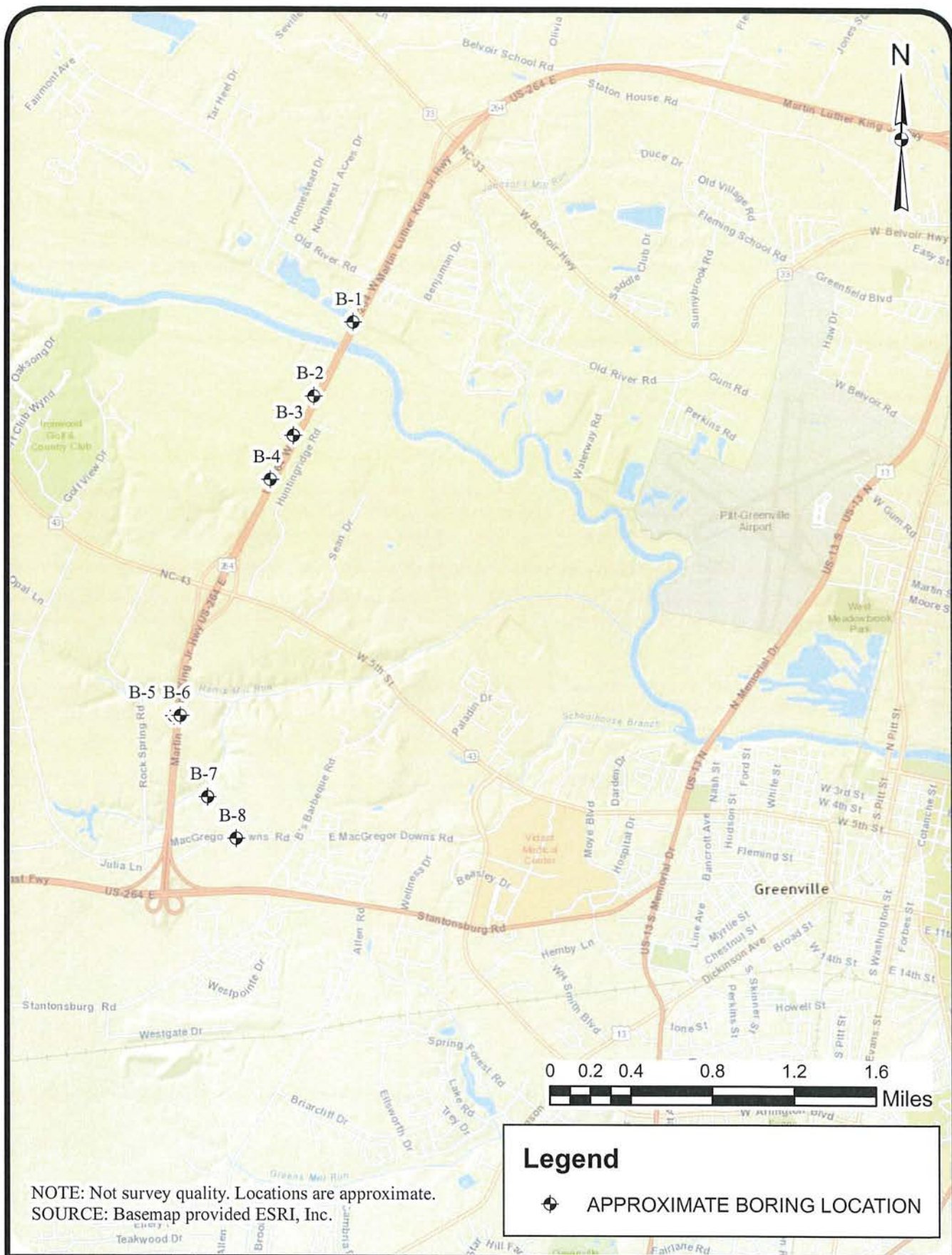
FIGURES

FIGURES

Site Vicinity Plan – Figure 1

Boring Location Plans – Figures 2, 4, 6, and 8

Generalized Subsurface Profiles – Figures 3, 5, 7, and 9



SCALE: As Shown
DATE: JUNE 2014
DRAWN BY: MWL
PROJECT NO: 1358-14-033



SITE VICINITY PLAN
US 264 HDD CROSSINGS
GREENVILLE, NORTH CAROLINA

FIGURE NO.

1



SCALE: As Shown
DATE: JUNE 2014
DRAWN BY: MWL
PROJECT NO: 1358-14-033

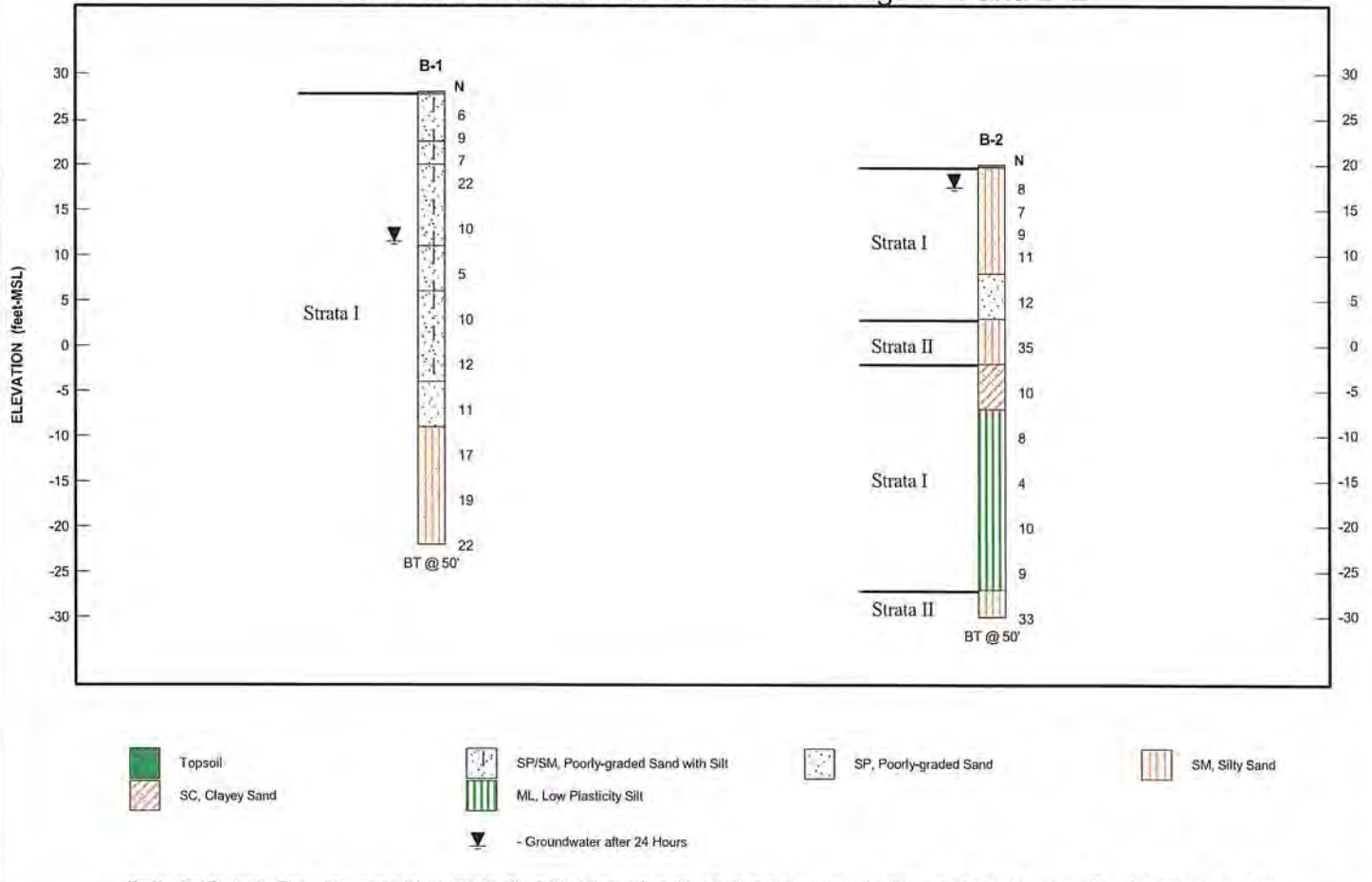


BORING LOCATION PLAN

US 264 HDD CROSSINGS
GREENVILLE, NORTH CAROLINA

FIGURE NO.
2

Generalized Subsurface Profile - Borings B-1 and B-2



N = Standard Penetration Test resistance value (blows per foot). The depicted stratigraphy is shown for illustrative purposes only. The actual subsurface conditions will vary between boring locations.

JOB NO: 1358-14-033

DATE: 7/24/14



3718 Old Battleground Road
Greensboro, North Carolina

Diagram: Generalized Subsurface Profile

Project: US 264 HDD Crossings

Location: Greenville, North Carolina

Figure
3



SCALE: As Shown
 DATE: JUNE 2014
 DRAWN BY: SDK
 PROJECT NO: 1358-14-033



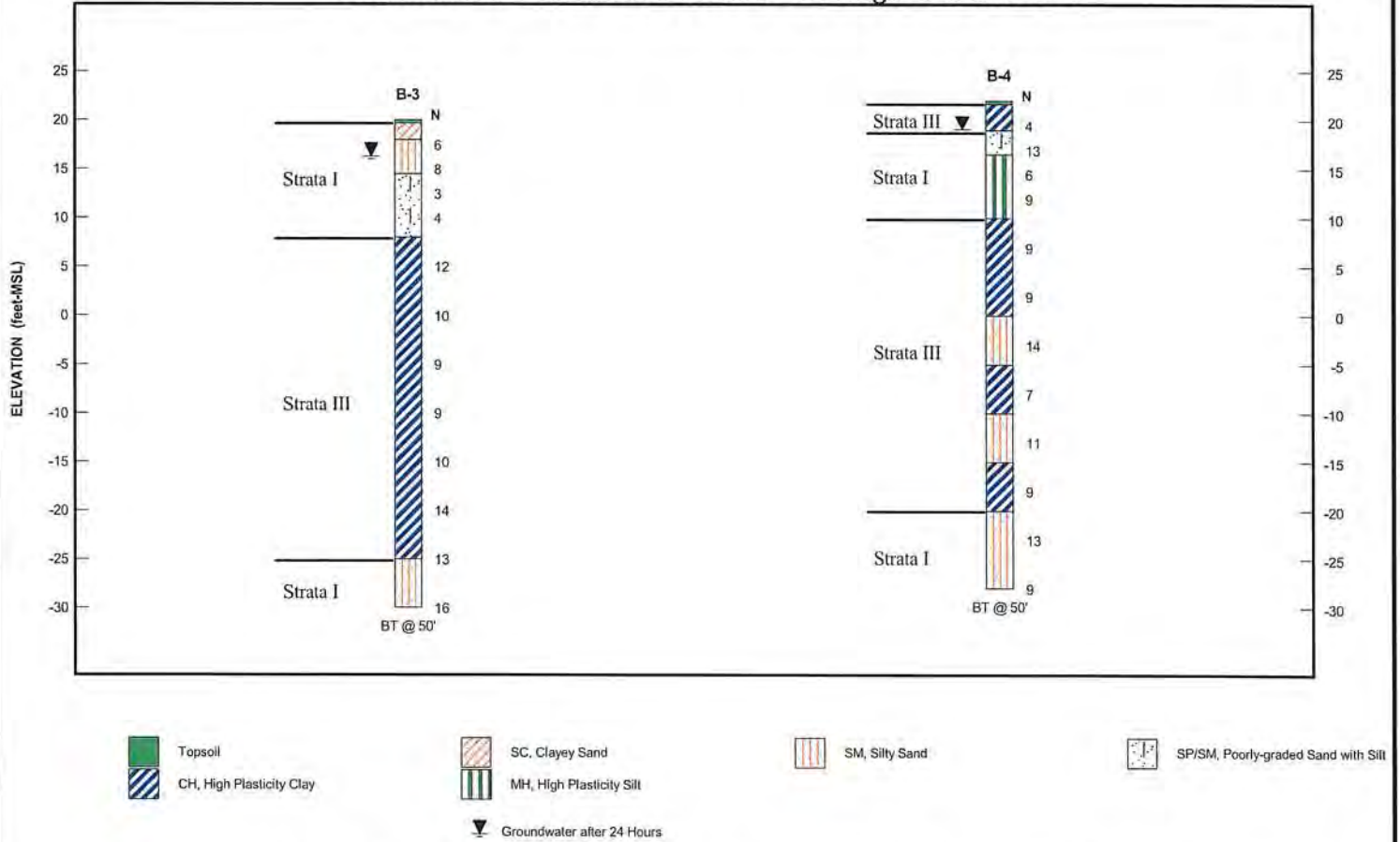
BORING LOCATION PLAN

US 264 HDD CROSSINGS
 GREENVILLE, NORTH CAROLINA

FIGURE NO.

4

Generalized Subsurface Profile - Borings B-3 and B-4



JOB NO: 1358-14-033

DATE: 7/24/14



3718 Old Battleground Road
Greensboro, North Carolina

Diagram: Generalized Subsurface Profile

Project: US 264 HDD Crossings

Location: Greenville, North Carolina

Figure
5



SCALE: As Shown
 DATE: JUNE 2014
 DRAWN BY: SDK
 PROJECT NO:
 1358-14-033



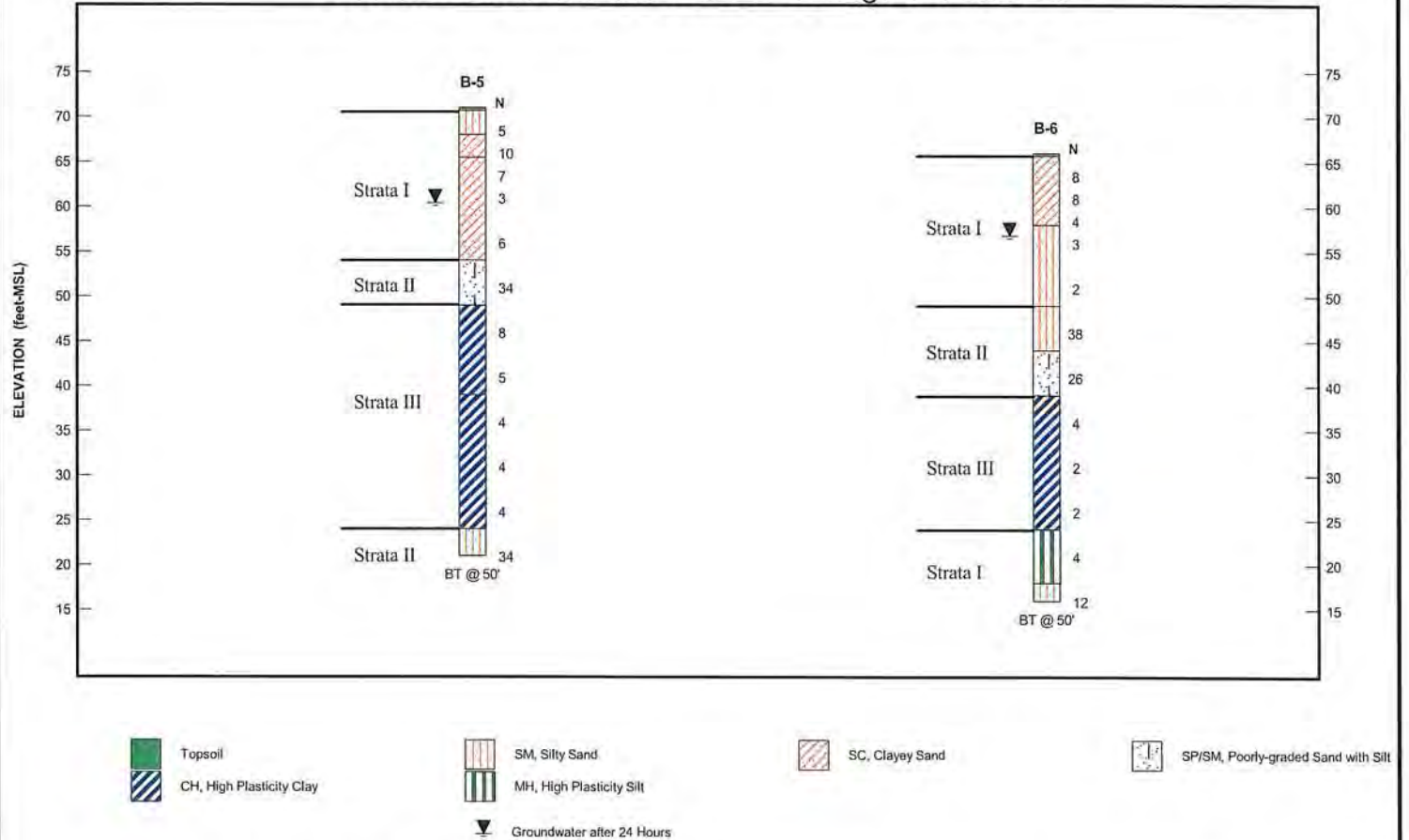
BORING LOCATION PLAN

US 264 HDD CROSSINGS
 GREENVILLE, NORTH CAROLINA

FIGURE
 NO.

6

Generalized Subsurface Profile - Borings B-5 and B-6



N = Standard Penetration Test resistance value (blows per foot). The depicted stratigraphy is shown for illustrative purposes only. The actual subsurface conditions will vary between boring locations.

JOB NO:	1358-14-033	 S&ME 3718 Old Battleground Road Greensboro, North Carolina	Diagram: Generalized Subsurface Profile	Figure 7
DATE:	7/24/14		Project: US 264 HDD Crossings Location: Greenville, North Carolina	



SCALE: As Shown
 DATE: JUNE 2014
 DRAWN BY: SDK
 PROJECT NO: 1358-14-033



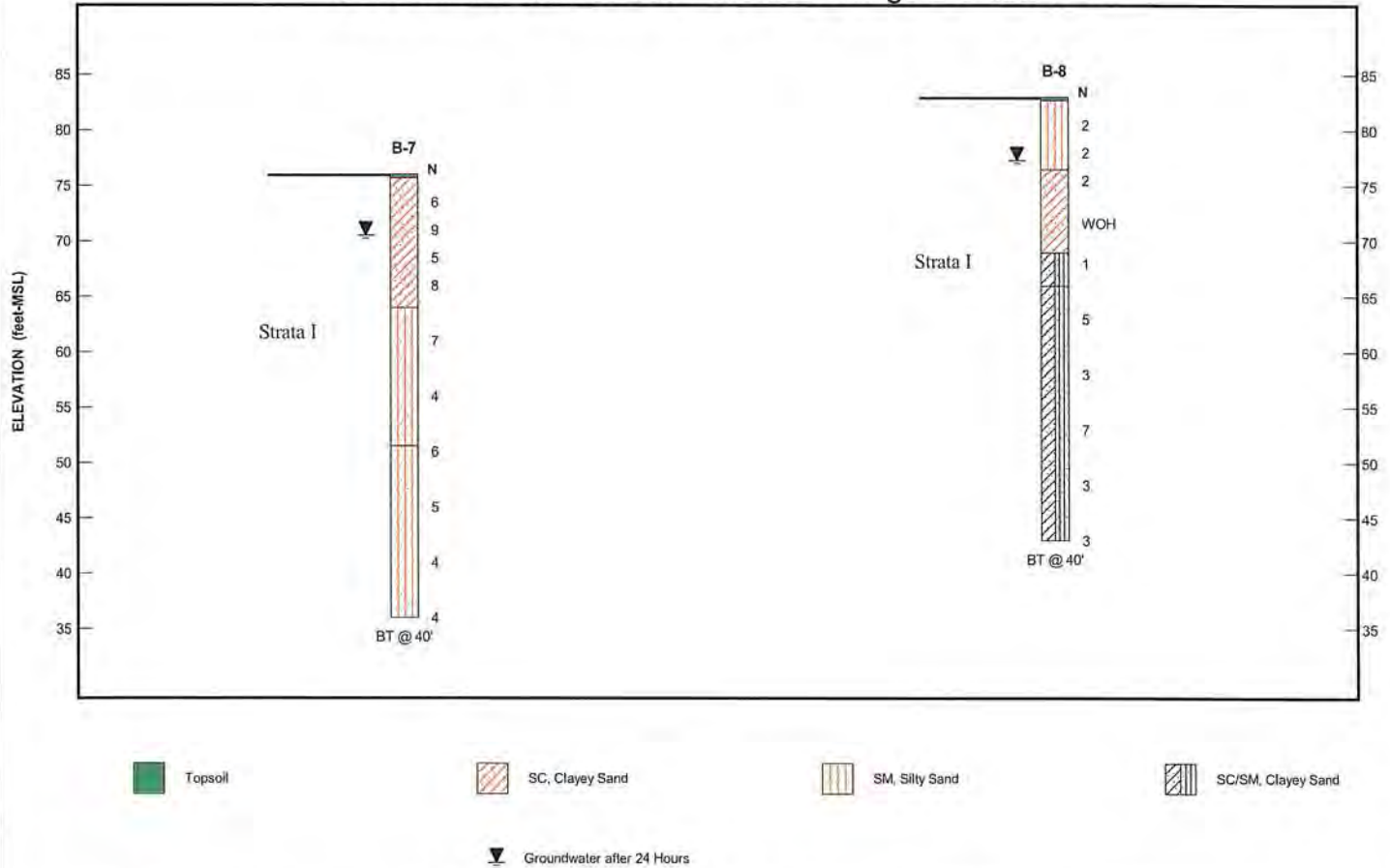
BORING LOCATION PLAN

US 264 HDD CROSSINGS
 GREENVILLE, NORTH CAROLINA

FIGURE NO.

8

Generalized Subsurface Profile - Borings B-7 and B-8



JOB NO: 1358-14-033

DATE: 7/24/14



3718 Old Battleground Road
Greensboro, North Carolina

Diagram: Generalized Subsurface Profile

Project: US 264 HDD Crossings

Location: Greenville, North Carolina

Figure
9

APPENDIX

APPENDIX A

Legend to Soil Classification and Symbols
Boring Logs (B-1 through B-8)

LEGEND TO SOIL CLASSIFICATION AND SYMBOLS

SOIL TYPES

(Shown in Graphic Log)



Fill



Asphalt



Concrete



Topsoil



Gravel



SP, Poorly Graded Sand



Silt



CH, High Plasticity Clay



MH, High Plasticity Silt



SM, Silty Sand



SC, Clayey Sand



SP/SM, Poorly-Graded Sand with Silt



SP/SC, Poorly-Graded Sand with Clay



ML, Low Plasticity Silt



CL, Low Plasticity Clay



Partially Weathered Rock



Cored Rock

WATER LEVELS

(Shown in Water Level Column)

▽ = Water Level At Termination of Boring

▼ = Water Level Taken After 24 Hours

◄ = Loss of Drilling Water

HC = Hole Cave

CONSISTENCY OF COHESIVE SOILS

CONSISTENCY

Very Soft

Soft

Firm

Stiff

Very Stiff

Hard

Very Hard

STD. PENETRATION RESISTANCE BLOWS/FOOT

0 to 2

3 to 4

5 to 8

9 to 15

16 to 30

31 to 50

Over 50

RELATIVE DENSITY OF COHESIONLESS SOILS

RELATIVE DENSITY

Very Loose

Loose

Medium Dense

Dense

Very Dense

STD. PENETRATION RESISTANCE BLOWS/FOOT

0 to 4

5 to 10

11 to 30

31 to 50

Over 50

SAMPLER TYPES

(Shown in Samples Column)

Shelby Tube



Split Spoon



Rock Core



No Recovery

TERMS

Standard Penetration Resistance - The Number of Blows of 140 lb. Hammer Falling 30 in. Required to Drive 1.4 in. I.D. Split Spoon Sampler 1 Foot. As Specified in ASTM D-1586.

REC - Total Length of Rock Recovered in the Core Barrel Divided by the Total Length of the Core Run Times 100%.

RQD - Total Length of Sound Rock Segments Recovered that are Longer Than or Equal to 4" (mechanical breaks excluded) Divided by the Total Length of the Core Run Times 100%.



PROJECT: US 264 HDD Crossings Greenville, North Carolina S&ME Project No. 1358-14-033				BORING LOG B-1								
DATE DRILLED: 7/8/14		ELEVATION: 28.0 ft		NOTES: Temporary PVC standpipe installed to 50.0 ft. Boring tremie grouted to the ground surface with cement-bentonite grout.								
DRILL RIG: CME 550		BORING DEPTH: 50.0 ft										
DRILLER: J. White		WATER LEVEL: 16.5 ft @ 24 hrs										
HAMMER TYPE: Autohammer		LOGGED BY: F. Wright										
SAMPLING METHOD: Split Spoon				NORTHING: 694465		EASTING: 2469110						
DRILLING METHOD: Wash Boring												
DEPTH (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER LEVEL	ELEVATION (feet)	SAMPLE NO.	SAMPLE TYPE	BLOW COUNT / CORE DATA 1st 6in / RUN # 2nd 6in / REC 3rd 6in / RQD	STANDARD PENETRATION TEST DATA (blows/ft) /REMARKS 10 20 30 6080				N VALUE
		<u>TOPSOIL</u> - 3 Inches			SS-1	▲	3 3 3					6
5		<u>COASTAL PLAIN: SAND (SP-SM)</u> loose, tan, fine to medium, moist, poorly graded, with silt		23.0	SS-2	▲	3 4 5					9
		<u>SAND (SP-SM)</u> loose, tan, fine to medium, moist, poorly graded, with silt			SS-3	▲	5 3 4					7
10		<u>SAND (SP-SM)</u> medium dense, gray tan, fine to medium, moist, poorly graded, with silt		18.0	SS-4	▲	5 9 13					22
15			▼	13.0	SS-5	▲	4 5 5					10
20		<u>SAND (SP-SM)</u> loose, tan, fine to medium, wet, poorly gaded, with silt		8.0	SS-6	▲	2 2 3					5
25		<u>SAND (SP-SM)</u> medium dense, gray tan, fine to medium, wet, poorly graded, with silt		3.0	SS-7	▲	5 5 5					10
30				-2.0	SS-8	▲	5 7 5					12
		<u>SAND (SP)</u> medium dense, orange brown, fine to medium, wet, poorly graded			SS-9	▲	4 4 7					11

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- STRATIFICATION AND GROUNDWATER DEPTHS ARE NOT EXACT.
- WATER LEVEL IS AT TIME OF EXPLORATION AND WILL VARY.



PROJECT: US 264 HDD Crossings Greenville, North Carolina S&ME Project No. 1358-14-033				BORING LOG B-1					
DATE DRILLED: 7/8/14		ELEVATION: 28.0 ft		NOTES: Temporary PVC standpipe installed to 50.0 ft. Boring tremie grouted to the ground surface with cement-bentonite grout.					
DRILL RIG: CME 550		BORING DEPTH: 50.0 ft							
DRILLER: J. White		WATER LEVEL: 16.5 ft @ 24 hrs							
HAMMER TYPE: Autohammer		LOGGED BY: F. Wright							
SAMPLING METHOD: Split Spoon				NORTHING: 694465		EASTING: 2469110			
DRILLING METHOD: Wash Boring									
DEPTH (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER LEVEL	ELEVATION (feet)	SAMPLE NO.	SAMPLE TYPE	BLOW COUNT / CORE DATA	STANDARD PENETRATION TEST DATA (blows/ft) / REMARKS	N VALUE
							1st 6in / RUN # 2nd 6in / REC 3rd 6in / RQD	10 20 30 60 80	
40		SILTY SAND (SM) medium dense, gray, fine to coarse, wet		-12.0	SS-10	⚡	6 7 10	●	17
45				-17.0	SS-11	⚡	9 9 10	●	19
50				-22.0	SS-12	⚡	11 9 13	●	22
		Boring terminated at 50 ft							

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PROJECT: US 264 HDD Crossings Greenville, North Carolina S&ME Project No. 1358-14-033		BORING LOG B-2	
DATE DRILLED: 7/2/14		ELEVATION: 20.0 ft	
DRILL RIG: CME 550		BORING DEPTH: 50.0 ft	
DRILLER: J. White		WATER LEVEL: 2.5 ft @ 24 hrs	
HAMMER TYPE: Autohammer		LOGGED BY: F. Wright	
SAMPLING METHOD: Split Spoon		NORTHING: 692568	EASTING: 2468099
DRILLING METHOD: Wash Boring			

DEPTH (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER LEVEL	ELEVATION (feet)	SAMPLE NO.	SAMPLE TYPE	BLOW COUNT / CORE DATA			STANDARD PENETRATION TEST DATA (blows/ft) / REMARKS				N VALUE
							1st 6in / RUN #	2nd 6in / REC	3rd 6in / ROD	10	20	30	60/80	
		TOPSOIL - 4 Inches												
		COASTAL PLAIN: SILTY SAND (SM) loose, tan, fine to coarse, moist to wet	▼		SS-1	▲	4	4	4					8
5				15.0	SS-2	▲	3	3	4					7
					SS-3	▲	3	4	5					9
10				10.0	SS-4	▲	5	5	6					11
		SAND (SP) loose, tan gray, medium to coarse, wet, poorly graded		5.0	SS-5	▲	4	3	9					12
15														
		SILTY SAND (SM) dense, gray tan, fine to medium, wet		0.0	SS-6	▲	13	14	21					35
20														
		CLAYEY SAND (SC) medium dense, gray, fine, wet, with silt and mica		-5.0	SS-7	▲	4	4	6					10
25														
		SANDY SILT (ML) firm to stiff, gray, wet, with mica		-10.0	SS-8	▲	3	3	5					8
30														
					SS-9	▲	4	3	1					4

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PROJECT: US 264 HDD Crossings Greenville, North Carolina S&ME Project No. 1358-14-033				BORING LOG B-2					
DATE DRILLED: 7/2/14		ELEVATION: 20.0 ft		NOTES: Temporary PVC standpipe installed to 50.0 ft. Boring tremie grouted to the ground surface with cement-bentonite grout.					
DRILL RIG: CME 550		BORING DEPTH: 50.0 ft							
DRILLER: J. White		WATER LEVEL: 2.5 ft @ 24 hrs							
HAMMER TYPE: Autohammer		LOGGED BY: F. Wright							
SAMPLING METHOD: Split Spoon				NORTHING: 692568		EASTING: 2468099			
DRILLING METHOD: Wash Boring									
DEPTH (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER LEVEL	ELEVATION (feet)	SAMPLE NO.	SAMPLE TYPE	BLOW COUNT / CORE DATA	STANDARD PENETRATION TEST DATA (blows/ft) /REMARKS	N VALUE
		SANDY SILT (ML) firm to stiff, gray, wet, with mica (<i>continued</i>)					1st 6in / RUN # 2nd 6in / REC 3rd 6in / RQD		
40				-20.0	SS-10		4 4 6		10
45				-25.0	SS-11		4 3 6		9
50		SILTY SAND (SM) dense, gray, fine, with clay		-30.0	SS-12		11 14 19		33
		Boring terminated at 50 ft							

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PROJECT: US 264 HDD Crossings Greenville, North Carolina S&ME Project No. 1358-14-033		BORING LOG B-3	
DATE DRILLED: 7/2/14		ELEVATION: 20.0 ft	
DRILL RIG: CME 550		BORING DEPTH: 50.0 ft	
DRILLER: J. White		WATER LEVEL: 3.7 ft @ 24 hrs	
HAMMER TYPE: Autohammer		LOGGED BY: F. Wright	
SAMPLING METHOD: Split Spoon		NORTHING: 691562 EASTING: 2467566	
DRILLING METHOD: Wash Boring			

DEPTH (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER LEVEL	ELEVATION (feet)	SAMPLE NO.	SAMPLE TYPE	BLOW COUNT / CORE DATA			STANDARD PENETRATION TEST DATA (blows/ft) /REMARKS					N VALUE
							1st 6in / RUN #	2nd 6in / REC	3rd 6in / RQD	10	20	30	60/80		
		TOPSOIL - 4 Inches													
		COASTAL PLAIN: CLAYEY SAND (SC) very loose, orange tan, fine, moist, with silt	▼		SS-1		2	2	4						6
5		SILTY SAND (SM) loose, orange tan, fine to medium, moist to wet		15.0	SS-2		4	4	4						8
		SAND (SP-SM) very loose, gray black, fine to medium, wet, poorly graded, with silt			SS-3		1	1	2						3
10				10.0	SS-4		2	1	3						4
		SANDY CLAY (CH) stiff to firm, gray black, wet, fat, with shells			SS-5		4	5	7						12
15				5.0	SS-6		3	5	5						10
20				0.0	SS-7		3	4	5						9
25				-5.0	SS-8		3	4	5						9
30				-10.0	SS-9		3	5	5						10

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PROJECT: US 264 HDD Crossings Greenville, North Carolina S&ME Project No. 1358-14-033				BORING LOG B-3					
DATE DRILLED: 7/2/14		ELEVATION: 20.0 ft		NOTES: Temporary PVC standpipe installed to 50.0 ft. Boring tremie grouted to the ground surface with cement-bentonite grout.					
DRILL RIG: CME 550		BORING DEPTH: 50.0 ft							
DRILLER: J. White		WATER LEVEL: 3.7 ft @ 24 hrs							
HAMMER TYPE: Autohammer		LOGGED BY: F. Wright							
SAMPLING METHOD: Split Spoon				NORTHING: 691562		EASTING: 2467566			
DRILLING METHOD: Wash Boring									
DEPTH (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER LEVEL	ELEVATION (feet)	SAMPLE NO.	SAMPLE TYPE	BLOW COUNT / CORE DATA	STANDARD PENETRATION TEST DATA (blows/ft) /REMARKS	N VALUE
							1st 6in / RUN # 2nd 6in / REC 3rd 6in / RQD	10 20 30 60 80	
40		<u>SANDY CLAY (CH)</u> stiff to firm, gray black, wet, fat, with shells <i>(continued)</i>		-20.0	SS-10		3 9 5		14
45		<u>SILTY SAND (SM)</u> medium dense, gray black, fine, wet, with clay		-25.0	SS-11		4 5 8		13
50		Boring terminated at 50 ft		-30.0	SS-12		6 7 9		16

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PROJECT: US 264 HDD Crossings Greenville, North Carolina S&ME Project No. 1358-14-033		BORING LOG B-4	
DATE DRILLED: 7/3/14		ELEVATION: 22.0 ft	
DRILL RIG: CME 550		BORING DEPTH: 50.0 ft	
DRILLER: J. White		WATER LEVEL: 2.9 ft @ 24 hrs	
HAMMER TYPE: Autohammer		LOGGED BY: F. Wright	
SAMPLING METHOD: Split Spoon		NORTHING: 690431	EASTING: 2466974
DRILLING METHOD: Wash Boring			

S&ME BORING LOG 1358-14-033 US 264 HDD CROSSING OF TAR RIVER.GPJ S&ME.GDT 7/24/14

DEPTH (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER LEVEL	ELEVATION (feet)	SAMPLE NO.	SAMPLE TYPE	BLOW COUNT / CORE DATA			STANDARD PENETRATION TEST DATA (blows/ft) /REMARKS				N VALUE
							1st 6in / RUN #	2nd 6in / REC	3rd 6in / ROD	10	20	30	60/80	
		TOPSOIL - 3 Inches												
		COASTAL PLAIN: SANDY CLAY (CH) stiff, gray tan, moist	▼		SS-1	▲	3	2	2					4
5		SAND (SP-SM) medium dense, gray tan, fine to medium, wet, poorly graded, with silt		17.0	SS-2	▲	7	6	7					13
		SILT (MH) firm to stiff, gray black, wet, elastic, with fine sand veins			SS-3	▲	2	2	4					6
10				12.0	SS-4	▲	3	4	5					9
		CLAY (CH) stiff, gray, wet, with sand and shells; with mica			SS-5	▲	3	4	5					9
15				7.0										
20				2.0	SS-6	▲	3	4	5					9
		SILTY SAND (SM) loose, gray olive, fine, wet, with clay			SS-7	▲	3	9	5					14
25				-3.0										
		SANDY CLAY (CH) firm, gray, wet, fat			SS-8	▲	3	3	4					7
30				-8.0										
		SILTY SAND (SM) medium dense, gray olive, fine, wet, with clay			SS-9	▲	4	4	7					11

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4. WATER LEVEL IS AT TIME OF EXPLORATION AND WILL VARY.



PROJECT: US 264 HDD Crossings Greenville, North Carolina S&ME Project No. 1358-14-033				BORING LOG B-4					
DATE DRILLED: 7/3/14		ELEVATION: 22.0 ft		NOTES: Temporary PVC standpipe installed to 50.0 ft. Boring tremie grouted to the ground surface with cement-bentonite grout.					
DRILL RIG: CME 550		BORING DEPTH: 50.0 ft							
DRILLER: J. White		WATER LEVEL: 2.9 ft @ 24 hrs							
HAMMER TYPE: Autohammer		LOGGED BY: F. Wright							
SAMPLING METHOD: Split Spoon				NORTHING: 690431		EASTING: 2466974			
DRILLING METHOD: Wash Boring									
DEPTH (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER LEVEL	ELEVATION (feet)	SAMPLE NO.	SAMPLE TYPE	BLOW COUNT / CORE DATA	STANDARD PENETRATION TEST DATA (blows/ft) /REMARKS	N VALUE
							1st 6in / RUN # 2nd 6in / REC 3rd 6in / RQD	10 20 30 60 80	
40		<u>SILTY SAND (SM)</u> medium dense, gray olive, fine, wet, with clay <i>(continued)</i>		-18.0	SS-10		4 4 5		9
45		<u>SANDY CLAY (CH)</u> stiff, gray black, wet, fat, with mica		-23.0	SS-11		3 5 8		13
50		<u>SILTY SAND (SM)</u> medium dense to loose, gray, fine to medium, wet, with clay		-28.0	SS-12		3 4 5		9
		Boring terminated at 50 ft							

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PROJECT: US 264 HDD Crossings Greenville, North Carolina S&ME Project No. 1358-14-033				BORING LOG B-5								
DATE DRILLED: 7/3/14		ELEVATION: 71.0 ft		NOTES: Temporary PVC standpipe installed to 50.0 ft. Boring tremie grouted to the ground surface with cement-bentonite grout.								
DRILL RIG: CME 550		BORING DEPTH: 50.0 ft										
DRILLER: J. White		WATER LEVEL: 10.6 ft @ 24 hrs										
HAMMER TYPE: Autohammer		LOGGED BY: F. Wright										
SAMPLING METHOD: Split Spoon				NORTHING: 684340		EASTING: 2464484						
DRILLING METHOD: Wash Boring												
DEPTH (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER LEVEL	ELEVATION (feet)	SAMPLE NO.	SAMPLE TYPE	BLOW COUNT / CORE DATA 1st 6in / RUN # 2nd 6in / REC 3rd 6in / RQD	STANDARD PENETRATION TEST DATA (blows/ft) /REMARKS 10 20 30 6080				N VALUE
		<u>TOPSOIL</u> - 4 Inches			SS-1	▲	2 2 3					5
		<u>COASTAL PLAIN: SILTY SAND (SM)</u> loose, gray tan red, fine			SS-2	▲	3 4 6					10
5		<u>CLAYEY SAND (SC)</u> medium dense, orange tan, fine to medium, moist, with silt		66.0	SS-3	▲	2 3 4					7
		<u>CLAYEY SAND (SC)</u> loose, orange tan, fine, moist to wet, with clay			SS-4	▲	2 1 2					3
10			▼	61.0	SS-5	▲	6 3 3					6
15				56.0	SS-6	▲	13 16 18					34
20		<u>SAND (SP-SM)</u> dense, gray tan, medium to fine, wet, poorly graded, with silt		51.0	SS-7	▲	6 4 4					8
25		<u>CLAY (CH)</u> firm, gray olive, wet, fat		46.0	SS-8	▲	2 1 4					5
30				41.0	SS-9	▲	1 2 2					4
		<u>SANDY CLAY (CH)</u> soft, gray, wet, with fine sandy seams										

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PROJECT: US 264 HDD Crossings Greenville, North Carolina S&ME Project No. 1358-14-033				BORING LOG B-5					
DATE DRILLED: 7/3/14		ELEVATION: 71.0 ft		NOTES: Temporary PVC standpipe installed to 50.0 ft. Boring tremie grouted to the ground surface with cement-bentonite grout.					
DRILL RIG: CME 550		BORING DEPTH: 50.0 ft							
DRILLER: J. White		WATER LEVEL: 10.6 ft @ 24 hrs							
HAMMER TYPE: Autohammer		LOGGED BY: F. Wright							
SAMPLING METHOD: Split Spoon				NORTHING: 684340		EASTING: 2464484			
DRILLING METHOD: Wash Boring									
DEPTH (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER LEVEL	ELEVATION (feet)	SAMPLE NO.	SAMPLE TYPE	BLOW COUNT / CORE DATA	STANDARD PENETRATION TEST DATA (blows/ft) /REMARKS	N VALUE
							1st 6in / RUN # 2nd 6in / REC 3rd 6in / RQD	10 20 30 60 80	
40		<u>SANDY CLAY (CH)</u> soft, gray, wet, with fine sandy seams <i>(continued)</i>		31.0	SS-10	⚡	1 1 3	●	4
45				26.0	SS-11	⚡	2 1 3	●	4
50				21.0	SS-12	⚡	16 16 18	●	34
		<u>SILTY SAND (SM)</u> dense, medium to fine, wet, with shells							
		Boring terminated at 50 ft							

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PROJECT: US 264 HDD Crossings Greenville, North Carolina S&ME Project No. 1358-14-033		BORING LOG B-6	
DATE DRILLED: 7/8/14		ELEVATION: 66.0 ft	
DRILL RIG: CME 550		BORING DEPTH: 50.0 ft	
DRILLER: J. White		WATER LEVEL: 9.2 ft @ 24 hrs	
HAMMER TYPE: Autohammer		LOGGED BY: F. Wright	
SAMPLING METHOD: Split Spoon		NORTHING: 684371	EASTING: 2464654
DRILLING METHOD: Wash Boring			

DEPTH (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER LEVEL	ELEVATION (feet)	SAMPLE NO.	SAMPLE TYPE	BLOW COUNT / CORE DATA			STANDARD PENETRATION TEST DATA (blows/ft) /REMARKS				N VALUE
							1st 6in / RUN #	2nd 6in / REC	3rd 6in / RQD	10	20	30	60/80	
		TOPSOIL - 4 Inches												
5		COASTAL PLAIN: CLAYEY SAND (SC) loose to very loose, orange tan red, fine, moist, with silt			SS-1	Δ	4	4	4					8
				61.0	SS-2	Δ	3	4	4					8
					SS-3	Δ	2	2	2					4
10		SILTY SAND (SM) very loose, gray tan, fine, moist to wet, with clay	▼	56.0	SS-4	Δ	2	2	1					3
					SS-5	Δ	1	1	1					2
15				51.0										
		SILTY SAND (SM) dense, gray, medium to fine, wet		46.0	SS-6	Δ	13	15	23					38
20														
		SAND (SP-SM) medium dense, gray, medium to fine, wet, poorly graded, with silt		41.0	SS-7	Δ	8	10	16					26
25														
		SANDY CLAY (CH) soft to very soft, gray olive, wet, fat		36.0	SS-8	Δ	2	1	3					4
30														
					SS-9	Δ	1	1	1					2

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S&ME BORING LOG 1358-14-033 US 264 HDD CROSSING OF TAR RIVER.GPJ S&ME.GDT 7/24/14

PROJECT: US 264 HDD Crossings Greenville, North Carolina S&ME Project No. 1358-14-033				BORING LOG				B-6			
DATE DRILLED: 7/8/14			ELEVATION: 66.0 ft			NOTES: Temporary PVC standpipe installed to 50.0 ft. Boring tremie grouted to the ground surface with cement-bentonite grout.					
DRILL RIG: CME 550			BORING DEPTH: 50.0 ft								
DRILLER: J. White			WATER LEVEL: 9.2 ft @ 24 hrs								
HAMMER TYPE: Autohammer			LOGGED BY: F. Wright								
SAMPLING METHOD: Split Spoon						NORTHING: 684371		EASTING: 2464654			
DRILLING METHOD: Wash Boring											
DEPTH (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER LEVEL	ELEVATION (feet)	SAMPLE NO.	SAMPLE TYPE	BLOW COUNT / CORE DATA			STANDARD PENETRATION TEST DATA (blows/ft) /REMARKS	N VALUE
							1st 6in / RUN #	2nd 6in / REC	3rd 6in / RQD	10 20 30 60 80	
40		SANDY CLAY (CH) soft to very soft, gray olive, wet, fat (continued)		26.0	SS-10	⚡	1	1	1	●	2
45		SILT (MH) soft, gray black, wet, elastic, with sand		21.0	SS-11	⚡	1	1	3	●	4
50		SILTY SAND (SM) medium dense, gray black, medium to fine, wet, with clay Boring terminated at 50 ft		16.0	SS-12	⚡	3	3	9	●	12

S&ME BORING LOG 1358-14-033 US 264 HDD CROSSING OF TAR RIVER.GPJ S&ME.GDT 7/24/14

NOTES:

1. THIS LOG IS ONLY A PORTION OF A REPORT PREPARED FOR THE NAMED PROJECT AND MUST ONLY BE USED TOGETHER WITH THAT REPORT.
2. BORING, SAMPLING AND PENETRATION TEST DATA IN GENERAL ACCORDANCE WITH ASTM D-1586.
3. STRATIFICATION AND GROUNDWATER DEPTHS ARE NOT EXACT.
4. WATER LEVEL IS AT TIME OF EXPLORATION AND WILL VARY.



PROJECT: US 264 HDD Crossings Greenville, North Carolina S&ME Project No. 1358-14-033				BORING LOG				B-7			
DATE DRILLED: 7/8/14			ELEVATION: 76.0 ft			NOTES: Temporary PVC standpipe installed to 40.0 ft. Boring tremie grouted to the ground surface with cement-bentonite grout.					
DRILL RIG: CME 550			BORING DEPTH: 40.0 ft								
DRILLER: J. White			WATER LEVEL: 5.5 ft @ 24 hrs								
HAMMER TYPE: Autohammer			LOGGED BY: F. Wright								
SAMPLING METHOD: Split Spoon						NORTHING: 682282		EASTING: 2465353			
DRILLING METHOD: Wash Boring											

DEPTH (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER LEVEL	ELEVATION (feet)	SAMPLE NO.	SAMPLE TYPE	BLOW COUNT / CORE DATA			STANDARD PENETRATION TEST DATA (blows/ft)					N VALUE
							1st 6in / RUN #	2nd 6in / REC	3rd 6in / RQD	/ REMARKS					
										10	20	30	60/80		
		TOPSOIL - 3 Inches													
		COASTAL PLAIN: CLAYEY SAND (SC) loose, orange tan, fine, moist to wet			SS-1	▲	2	3	3					6	
5				71.0	SS-2	▲	4	4	5					9	
					SS-3	▲	2	2	3					5	
10				66.0	SS-4	▲	3	3	5					8	
		SILTY SAND (SM) loose, orange tan, fine, wet			SS-5	▲	3	4	3					7	
15				61.0											
					SS-6	▲	2	2	2					4	
20				56.0											
					SS-7	▲	2	2	4					6	
25		SILTY SAND (SM) loose, gray, fine to medium, wet		51.0											
					SS-8	▲	2	3	2					5	
30				46.0											
					SS-9	▲	1	2	2					4	

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4. WATER LEVEL IS AT TIME OF EXPLORATION AND WILL VARY.



PROJECT: US 264 HDD Crossings Greenville, North Carolina S&ME Project No. 1358-14-033				BORING LOG B-7					
DATE DRILLED: 7/8/14		ELEVATION: 76.0 ft		NOTES: Temporary PVC standpipe installed to 40.0 ft. Boring tremie grouted to the ground surface with cement-bentonite grout.					
DRILL RIG: CME 550		BORING DEPTH: 40.0 ft							
DRILLER: J. White		WATER LEVEL: 5.5 ft @ 24 hrs							
HAMMER TYPE: Autohammer		LOGGED BY: F. Wright							
SAMPLING METHOD: Split Spoon				NORTHING: 682282		EASTING: 2465353			
DRILLING METHOD: Wash Boring									
DEPTH (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER LEVEL	ELEVATION (feet)	SAMPLE NO.	SAMPLE TYPE	BLOW COUNT / CORE DATA	STANDARD PENETRATION TEST DATA (blows/ft) / REMARKS	N VALUE
							1st 6in / RUN #	2nd 6in / REC	
40		<u>SILTY SAND (SM)</u> loose, gray, fine to medium, wet <i>(continued)</i>		36.0	SS-10		2 2 2		4
		Boring terminated at 40 ft							

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3. STRATIFICATION AND GROUNDWATER DEPTHS ARE NOT EXACT.
4. WATER LEVEL IS AT TIME OF EXPLORATION AND WILL VARY.



PROJECT: US 264 HDD Crossings Greenville, North Carolina S&ME Project No. 1358-14-033		BORING LOG B-8	
DATE DRILLED: 7/8/14		ELEVATION: 83.0 ft	
DRILL RIG: CME 550		BORING DEPTH: 40.0 ft	
DRILLER: J. White		WATER LEVEL: 5.7 ft @ 24 hrs	
HAMMER TYPE: Autohammer		LOGGED BY: F. Wright	
SAMPLING METHOD: Split Spoon		NORTHING: 681213	EASTING: 2466098
DRILLING METHOD: Wash Boring			

DEPTH (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER LEVEL	ELEVATION (feet)	SAMPLE NO.	SAMPLE TYPE	BLOW COUNT / CORE DATA			STANDARD PENETRATION TEST DATA (blows/ft) /REMARKS				N VALUE
							1st 6in / RUN #	2nd 6in / REC	3rd 6in / RQD	10	20	30	60/80	
		TOPSOIL - 3 Inches												
		COASTAL PLAIN: SILTY SAND (SM) very loose, gray, fine, moist to wet			SS-1	▲	3	1	1					2
5				78.0	SS-2	▲	1	1	1					2
		CLAYEY SAND (SC) very loose, white tan, fine			SS-3	▲	1	1	1					2
10				73.0	SS-4	▲	WOH	WOH	WOH					WOH
		SILTY SAND (SC-SM) very loose, gray, fine, wet, with clay			SS-5	▲	WOH	WOH	1					1
15				68.0										
		SILTY SAND (SC-SM) loose to very loose, gray, fine, wet, with clay			SS-6	▲	2	2	3					5
20				63.0										
				58.0	SS-7	▲	2	1	2					3
25														
				53.0	SS-8	▲	2	3	4					7
30														
					SS-9	▲	2	1	2					3

NOTES:

1. THIS LOG IS ONLY A PORTION OF A REPORT PREPARED FOR THE NAMED PROJECT AND MUST ONLY BE USED TOGETHER WITH THAT REPORT.
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3. STRATIFICATION AND GROUNDWATER DEPTHS ARE NOT EXACT.
4. WATER LEVEL IS AT TIME OF EXPLORATION AND WILL VARY.



PROJECT: US 264 HDD Crossings Greenville, North Carolina S&ME Project No. 1358-14-033				BORING LOG				B-8						
DATE DRILLED: 7/8/14			ELEVATION: 83.0 ft			NOTES: Temporary PVC standpipe installed to 40.0 ft. Boring tremie grouted to the ground surface with cement-bentonite grout.								
DRILL RIG: CME 550			BORING DEPTH: 40.0 ft											
DRILLER: J. White			WATER LEVEL: 5.7 ft @ 24 hrs											
HAMMER TYPE: Autohammer			LOGGED BY: F. Wright											
SAMPLING METHOD: Split Spoon						NORTHING: 681213		EASTING: 2466098						
DRILLING METHOD: Wash Boring														
DEPTH (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER LEVEL	ELEVATION (feet)	SAMPLE NO.	SAMPLE TYPE	BLOW COUNT / CORE DATA			STANDARD PENETRATION TEST DATA (blows/ft)				N VALUE
							1st 6in / RUN #	2nd 6in / REC	3rd 6in / RQD	/ REMARKS				
40		SILTY SAND (SC-SM) loose to very loose, gray, fine, wet, with clay <i>(continued)</i>		43.0	SS-10		1	1	2					3
		Boring terminated at 40 ft												

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APPENDIX B

Summary of Laboratory Test Data
Laboratory Test Results (34 pages)



SUMMARY OF LABORATORY TEST DATA
US 264 HDD Crossings
Greenville, North Carolina
S&ME Project No. 1358-14-033

SAMPLE LOCATION				Sample Type	USCS Classification	Atterberg Limits			Natural Moisture Content	Diameter (millimeters)				% Silt and Clay	% Sand			% Gravel
Boring	Sample #	Depth	Strata			LL	PL	PI		D ₁₀₀	D ₆₀	D ₃₀	D ₁₅		Fine	Medium	Coarse	
B-1	5	13.5' - 15'	I	SS	SP-SM	—	—	—	20.7	2.3	0.53	0.31	0.17	5.0	39.3	52.8	2.8	0.1
	9	33.5' - 35'	I	SS	SP	—	—	—	22.8	1.0	0.51	0.33	0.17	3.8	38.9	56.8	0.5	0.0
B-2	5	13.5' - 15'	I	SS	SP	—	—	—	21.1	10.1	1.70	0.63	0.40	2.2	9.7	54.3	18.9	14.9
	9	33.5' - 35'	I	SS	ML	32	30	2	32.9	0.2	—	—	—	64.9	34.9	0.2	0.0	0.0
B-3	4	8.5' - 10'	I	SS	ML	28	23	5	26.9	—	—	—	—	—	—	—	—	—
	5	13.5' - 15'	III	SS	SP-SM	—	—	—	23.5	2.7	0.41	0.20	0.11	5.4	53.9	38.6	2.1	0.0
B-4	5	13.5' - 15'	III	SS	CH	56	25	31	35.3	—	—	—	—	—	—	—	—	—
	10	38.5' - 40'	III	SS	CH	57	23	34	30.2	2.0	—	—	—	75.9	23.2	0.9	0.0	0.0
B-5	2	3.5' - 5'	I	SS	SP-SM	—	—	—	17.4	4.8	0.68	0.32	0.14	5.2	35.8	53.1	5.7	0.2
	3	6.0' - 7.5'	I	SS	MH	84	38	46	48.8	—	—	—	—	—	—	—	—	—
	8	28.5' - 30'	III	SS	CH	61	22	39	29.3	4.6	—	—	—	71.3	26.5	1.5	0.7	0.0
	10	38.5' - 40'	III	SS	CH	55	24	31	32.0	—	—	—	—	—	—	—	—	—
B-6	4	8.5' - 10'	I	SS	SC	—	—	—	40.2	2.0	0.10	—	—	46.2	52.9	0.8	0.1	0.0
	6	18.5' - 20'	II	SS	SP-SM	—	—	—	16.8	2.0	0.59	0.34	0.11	7.7	31.9	60.0	0.4	0.0
	7	23.5' - 25'	III	SS	CH	53	27	26	35.9	—	—	—	—	—	—	—	—	—
	9	33.5' - 35'	III	SS	CH	55	26	29	44.3	0.4	0.08	—	—	51.4	48.2	0.4	0.0	0.0
B-7	5	13.5' - 15'	I	SS	SM	—	—	—	29.3	2.0	0.53	0.27	—	14.1	35.3	50.1	0.5	0.0
	7	23.5' - 25'	II	SS	SP-SM	—	—	—	18.4	2.0	0.64	0.40	0.16	6.0	27.4	66.0	0.6	0.0
	8	28.5' - 30'	III	SS	CH	79	35	44	77.1	—	—	—	—	—	—	—	—	—
	10	38.5' - 40'	III	SS	CH	70	29	41	67.6	—	—	—	—	—	—	—	—	—
B-8	4	8.5' - 10'	I	SS	MH	64	39	25	59.5	4.8	0.09	—	—	52.0	41.1	5.5	1.4	0.0
	6	18.5' - 20'	I	SS	SC	—	—	—	17.9	2.0	0.13	—	—	31.1	65.6	3.3	0.0	0.0
	8	28.5' - 30'	I	SS	SM	—	—	—	36.5	0.2	0.11	0.08	—	22.4	77.1	0.5	0.0	0.0
	10	38.5' - 40'	I	SS	SM	—	—	—	33.4	0.4	0.11	0.08	—	18.4	81.1	0.5	0.0	0.0
B-9	4	8.5' - 10'	I	SS	SC	—	—	—	32.9	0.8	0.11	—	—	35.1	63.6	1.3	0.0	0.0
	7	23.5' - 25'	I	SS	SC-SM	—	—	—	37.5	0.4	0.11	0.08	—	30.6	69.3	0.1	0.0	0.0
	9	33.5' - 35'	I	SS	SC-SM	—	—	—	32.1	0.4	0.12	0.09	—	16.1	83.7	0.2	0.0	0.0

SS - Split Spoon Soil Sample

LL - Liquid Limit

PL - Plastic Limit

PI - Plasticity Index

Laboratory Determination of Water Content



ASTM D 2216



AASHTO T 265



Quality Assurance

S&ME, Inc. Raleigh, 3201 Spring Forest Road, Raleigh, North Carolina 27616

Project #: 1358-14-033

Report Date: 07/17/2014

Project Name: US 264 HDD Crossings

Test Date(s): 07/14 - 07/15/2014

Client Name: RK&K

Client Address: 2100 East Cary Street, Suite 209, Richmond, VA 23223

Sample by: S&ME, Inc.

Sample Date(s): Varies

Sampling Method: Site Borehole

Drill Rig: N/A

Method: A (1%) ☐ B (0.1%) ☒ Balance ID: 1024 Calibration Date: 11/14/13

Boring No.	Sample No.	Sample Depth	Tare #	Tare Weight	Tare Wt.+ Wet Wt	Tare Wt. + Dry Wt	Water Weight	Percent Moisture
		ft. or m.		grams	grams	grams	grams	%
B-1	S-5	13.5' - 15.0'	137	111.73	389.82	342.08	47.74	20.7%
B-1	S-9	33.5' - 35.0'	121	111.62	409.24	354.04	55.20	22.8%
B-2	S-5	13.5' - 15.0'	130	109.97	442.72	384.74	57.98	21.1%
B-2	S-9	33.5' - 35.0'	116	118.07	249.68	217.13	32.55	32.9%
B-2	S-11	43.5' - 45.0'	119	116.09	200.27	182.43	17.84	26.9%
B-3	S-4	8.5' - 10.0'	135	99.68	323.00	280.50	42.50	23.5%
B-3	S-5	38.5' - 40.0'	108	91.53	200.82	172.30	28.52	35.3%
B-3	S-10	38.5' - 40.0'	139	106.89	198.43	177.19	21.24	30.2%
B-4	S-2	3.5' - 5.0'	147	115.73	406.19	363.04	43.15	17.4%
B-4	S-3	6.0' - 7.5'	102	117.27	205.74	176.71	29.03	48.8%
B-4	S-8	28.5' - 30.0'	144	133.62	208.64	191.64	17.00	29.3%
B-4	S-10	38.5' - 40.0'	106	115.69	225.58	198.95	26.63	32.0%
B-5	S-4	8.5' - 10.0'	146	93.91	262.91	214.43	48.48	40.2%
B-5	S-6	18.5' - 20.0'	107	123.04	375.35	339.09	36.26	16.8%
B-5	S-7	23.5' - 25.0'	129	113.25	203.60	179.73	23.87	35.9%
B-5	S-9	33.5' - 35.0'	105	108.77	200.33	172.22	28.11	44.3%

Notes / Deviations / References

AASHTO T 265: Laboratory Determination of Moisture Content of Soils

ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass

Mal Krajan, ET

Technician Name

Signature

N/A

Certification Type / No.

Date

Mal Krajan, ET

Technical Responsibility

Signature

Laboratory Manager

Position

Date

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Laboratory Determination of Water Content



ASTM D 2216



AASHTO T 265



Quality Assurance

S&ME, Inc. Raleigh, 3201 Spring Forest Road, Raleigh, North Carolina 27616

Project #: 1358-14-033

Report Date: 07/17/2014

Project Name: US 264 HDD Crossings

Test Date(s): 07/14 - 07/15/2014

Client Name: RK&K

Client Address: 2100 East Cary Street, Suite 209, Richmond, VA 23223

Sample by: S&ME, Inc.

Sample Date(s): Varies

Sampling Method: Site Borehole

Drill Rig: N/A

Method: A (1%) ☐ B (0.1%) ☒ Balance ID. 1024 Calibration Date: 11/14/13

Boring No.	Sample No.	Sample Depth	Tare #	Tare Weight	Tare Wt.+ Wet Wt	Tare Wt. + Dry Wt	Water Weight	Percent Moisture
		ft. or m.		grams	grams	grams	grams	%
B-6	S-5	13.5' - 15.0'	110	106.51	325.79	276.15	49.64	29.3%
B-6	S-7	23.5' - 25.0'	132	126.16	495.14	437.82	57.32	18.4%
B-6	S-8	28.5' - 30.0'	101	125.01	224.79	181.35	43.44	77.1%
B-6	S-10	38.5' - 40.0'	136	113.04	229.84	182.72	47.12	67.6%
B-6	S-11	43.5' - 45.0'	112	97.72	220.39	174.61	45.78	59.5%
B-7	S-4	8.5' - 10.0'	127	107.64	369.24	329.60	39.64	17.9%
B-7	S-6	18.5' - 20.0'	117	118.31	380.83	310.61	70.22	36.5%
B-7	S-8	28.5' - 30.0'	5X1	73.20	363.66	290.98	72.68	33.4%
B-8	S-4	8.5' - 10.0'	203	69.22	260.32	213.03	47.29	32.9%
B-8	S-7	23.5' - 25.0'	2X	74.19	322.63	254.88	67.75	37.5%
B-8	S-9	33.5' - 35.0'	53	120.06	453.23	372.30	80.93	32.1%

Notes / Deviations / References

AASHTO T 265: Laboratory Determination of Moisture Content of Soils

ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass

Mal Krajan, ET

Technician Name

Signature

N/A

Certification Type / No.

Date

Mal Krajan, ET

Technical Responsibility

Signature

Laboratory Manager

Position

Date

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Sieve Analysis of Soils

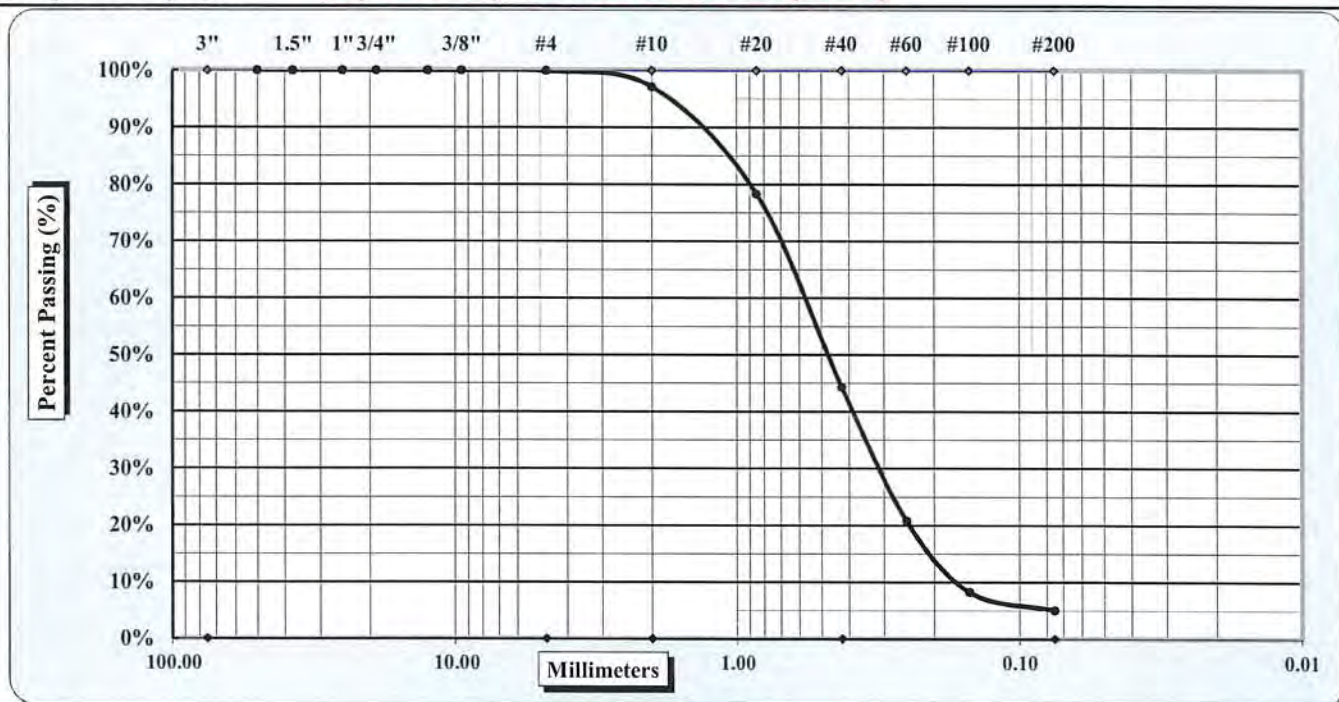


ASTM D 6913

Quality Assurance

S&ME, Inc. Raleigh, 3201 Spring Forest Road, Raleigh, North Carolina 27616

Project #:	1358-14-033	Report Date:	07/17/2014
Project Name:	US 264 HDD Crossings	Test Date(s):	07/14 - 07/16/2014
Client Name:	RK&K		
Client Address:	2100 East Cary Street, Suite 209, Richmond, VA 23223		
Boring No.:	B-1	Sample #:	S-5
		Sample Date:	07/08/2014
Location:	Site-Borehole	Offset:	N/A
		Depth (ft):	13.5' - 15.0'
Sample Description:	Gray Tan Poorly Graded SAND with Silt (SP-SM)		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
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

Maximum Particle Size	3/8"	Coarse Sand	2.8%	Fine Sand	39.3%
Gravel	0.1%	Medium Sand	52.8%	Silt & Clay	5.0%
Liquid Limit	ND	Plastic Limit	ND	Plastic Index	ND
Specific Gravity	ND			Moisture Content	20.7%

Coarse Sand	2.8%	Medium Sand	52.8%	Fine Sand	39.3%

Description of Sand & Gravel Particles:		Rounded	☐	Angular	☒
Hard & Durable	☒	Soft	☐	Weathered & Friable	☐

Notes / Deviations / References: ND=Not Determined.

Mal Krajan, ET

Technical Responsibility

Laboratory Manager

Position

Date

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Sieve Analysis of Soils



ASTM D 6913

Quality Assurance

S&ME, Inc. Raleigh, 3201 Spring Forest Road, Raleigh, North Carolina 27616

Project #: 1358-14-033

Report Date: 07/17/2014

Project Name: US 264 HDD Crossings

Test Date(s): 07/14 - 07/16/2014

Client Name: RK&K

Client Address: 2100 East Cary Street, Suite 209, Richmond, VA 23223

Boring No.: B-1

Sample #: S-9

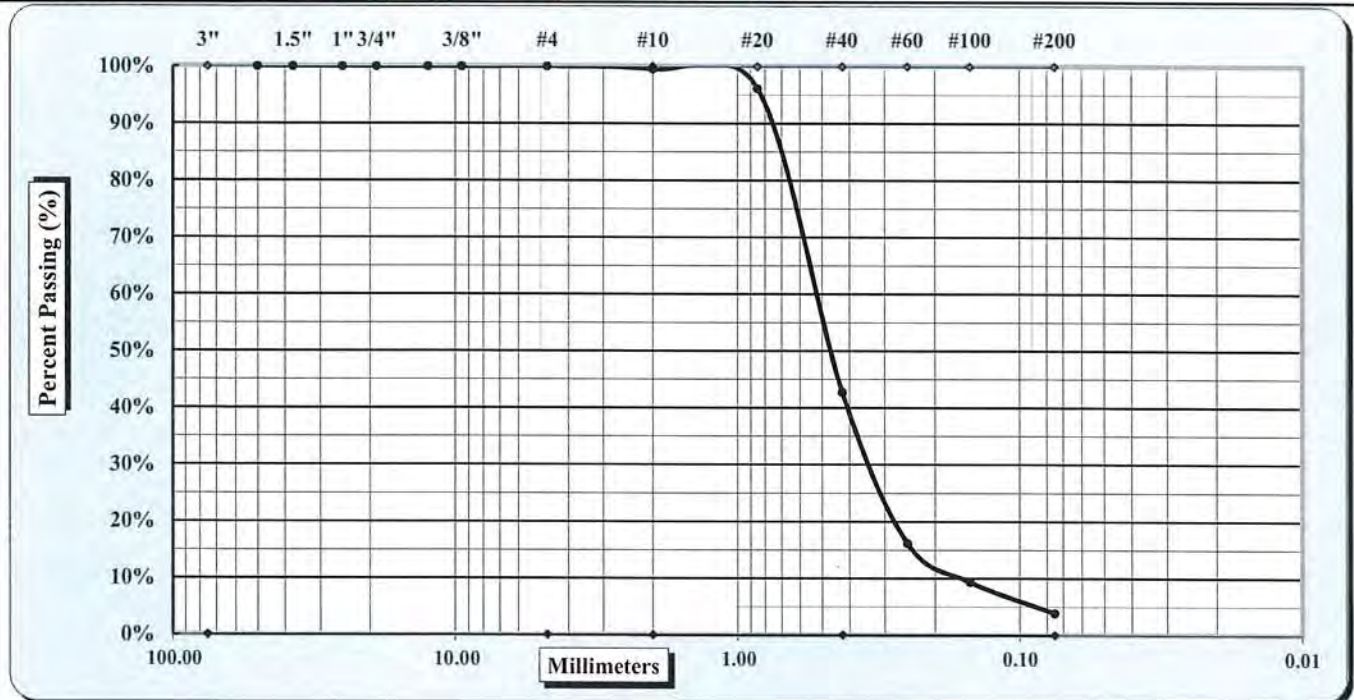
Sample Date: 07/08/2014

Location: Site-Borehole

Offset: N/A

Depth (ft): 33.5' - 35.0'

Sample Description: Orange Brown Poorly Graded SAND (SP)



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and > 2.0 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.0 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size	#4	Coarse Sand	0.5%	Fine Sand	38.9%

Gravel	0.0%	Medium Sand	56.8%	Silt & Clay	3.8%

Liquid Limit	ND	Plastic Limit	ND	Plastic Index	ND

Specific Gravity	ND	Moisture Content	22.8%

Coarse Sand	0.5%	Medium Sand	56.8%	Fine Sand	38.9%

Description of Sand & Gravel Particles:	Rounded	☐	Angular	☒

Hard & Durable	☒	Soft	☐	Weathered & Friable	☐

Notes / Deviations / References: ND=Not Determined.

Mal Krajan, ET

Technical Responsibility

Laboratory Manager

Position

Date

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Sieve Analysis of Soils



ASTM D 6913

Quality Assurance

S&ME, Inc. Raleigh, 3201 Spring Forest Road, Raleigh, North Carolina 27616

Project #: 1358-14-033

Report Date: 07/17/2014

Project Name: US 264 HDD Crossings

Test Date(s): 07/14 - 07/16/2014

Client Name: RK&K

Client Address: 2100 East Cary Street, Suite 209, Richmond, VA 23223

Boring No.: B-2

Sample #: S-5

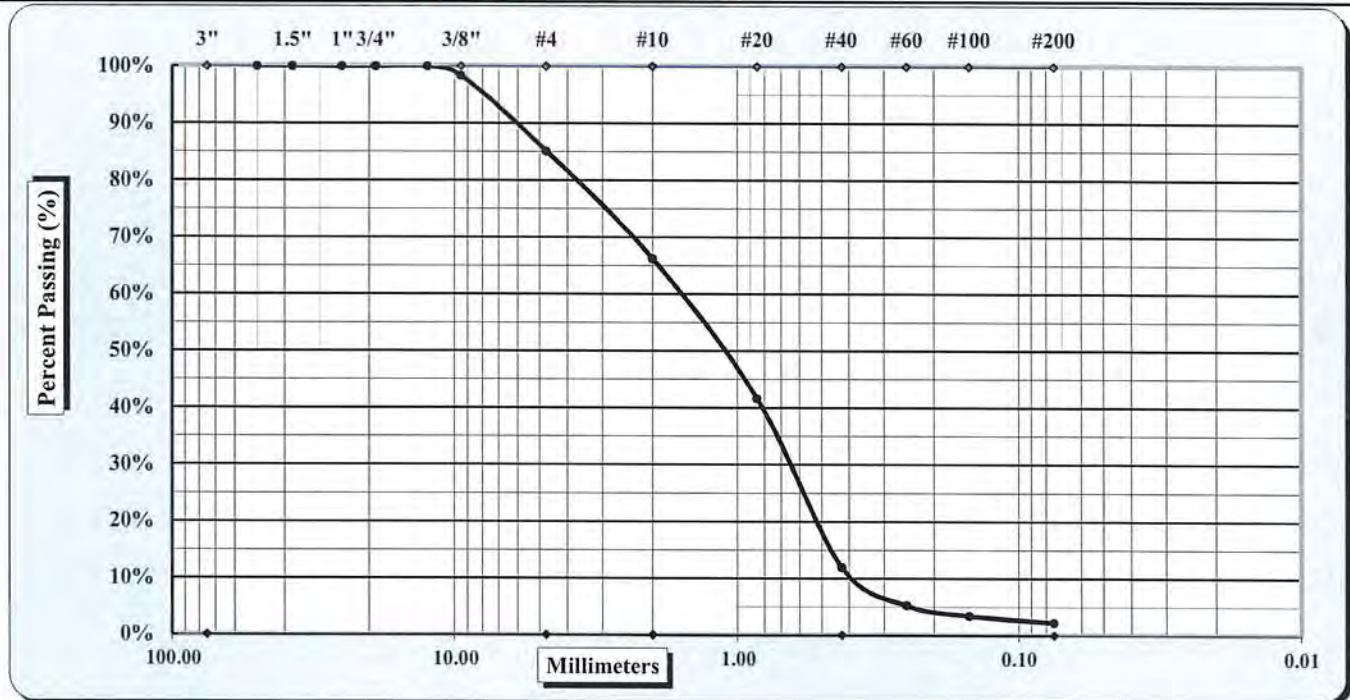
Sample Date: 07/02/2014

Location: Site-Borehole

Offset: N/A

Depth (ft): 13.5' - 15.0'

Sample Description: Tan Gray Poorly Graded SAND (SP)



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
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

Maximum Particle Size	1/2"	Coarse Sand	18.9%	Fine Sand	9.7%

Gravel	14.9%	Medium Sand	54.3%	Silt & Clay	2.2%

Liquid Limit	ND	Plastic Limit	ND	Plastic Index	ND

Specific Gravity	ND	Moisture Content	21.1%

Coarse Sand	18.9%	Medium Sand	54.3%	Fine Sand	9.7%

Description of Sand & Gravel Particles:	Rounded	☒	Angular	☒

Hard & Durable	☒	Soft	☐	Weathered & Friable	☐

Notes / Deviations / References: ND=Not Determined.

Mal Krajan, ET

Technical Responsibility

Laboratory Manager

Position

Date

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Sieve Analysis of Soils



ASTM D 6913

Quality Assurance

S&ME, Inc. Raleigh, 3201 Spring Forest Road, Raleigh, North Carolina 27616

Project #: 1358-14-033

Report Date: 07/17/2014

Project Name: US 264 HDD Crossings

Test Date(s): 07/14 - 07/16/2014

Client Name: RK&K

Client Address: 2100 East Cary Street, Suite 209, Richmond, VA 23223

Boring No.: B-2

Sample: S-9

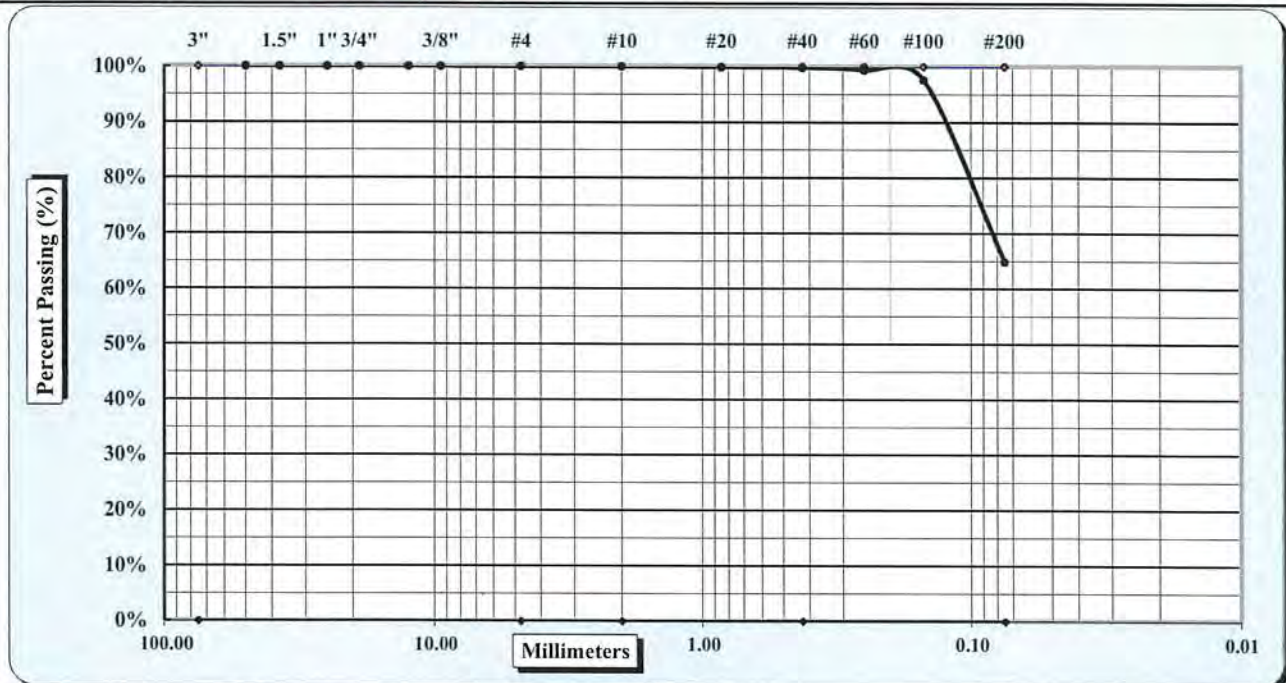
Sample Date: 07/02/2014

Location: Site-Borehole

Offset: N/A

Depth (ft): 33.5' - 35.0'

Sample Description: Gray Sandy SILT (ML)



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
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

Maximum Particle Size	#10	Coarse Sand	0.0%	Fine Sand	34.9%
Gravel	0.0%	Medium Sand	0.2%	Silt & Clay	64.9%
Liquid Limit	32	Plastic Limit	30	Plastic Index	2
Specific Gravity	ND			Moisture Content	32.9%
Coarse Sand	0.0%	Medium Sand	0.2%	Fine Sand	34.9%

Description of Sand & Gravel Particles: Rounded ☐ Angular ☒
 Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

Notes / Deviations / References:

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

ASTM D 2487: Classification of Soils for Engineering Purposes (Unified Soil Classification System)

Mal Krajan, ET

Technical Responsibility

Laboratory Manager

Position

Date

Signature

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Liquid Limit, Plastic Limit, and Plastic Index



S&ME, Inc. Raleigh, 3201 Spring Forest Road, Raleigh, North Carolina 27616

Project #: 1358-14-033

Report Date: 07/17/2014

Project Name: US 264 HDD Crossings

Test Date(s) 07/14 - 07/16/2014

Client Name: RK&K

Client Address: 2100 East Cary Street, Suite 209, Richmond, VA 23223

Boring #: B-2

Sample #: S-9

Sample Date: 07/02/2014

Location: Site-Borehole

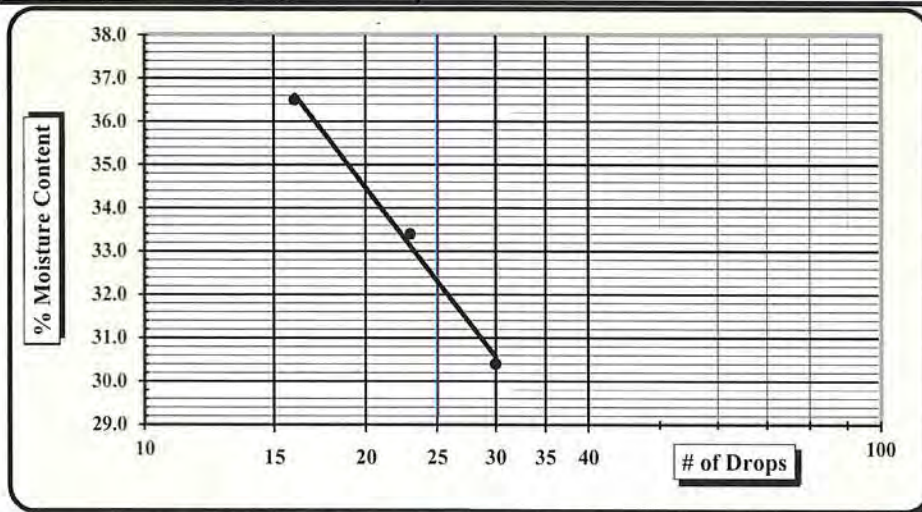
Offset: N/A

Depth (ft): 33.5' - 35.0'

Sample Description: Gray Sandy SILT (ML)

Type and Specification	S&ME ID #	Cal Date:	Type and Specification	S&ME ID #	Cal Date:
Balance (0.01 g)	1024	11/14/2013	Grooving tool	S-1	5/20/2014
LL Apparatus	1084	8/17/2013			
Oven	1454	10/1/2013			

Pan #	Tare #:	Liquid Limit					Plastic Limit		
		12	1	9			7	12	
A	Tare Weight	13.02	12.92	13.09			15.34	11.15	
B	Wet Soil Weight + A	26.06	25.50	25.00			26.29	24.27	
C	Dry Soil Weight + A	22.57	22.35	22.22			23.78	21.20	
D	Water Weight (B-C)	3.49	3.15	2.78			2.51	3.07	
E	Dry Soil Weight (C-A)	9.55	9.43	9.13			8.44	10.05	
F	% Moisture (D/E)*100	36.5%	33.4%	30.4%			29.7%	30.5%	
N	# OF DROPS	16	23	30			Moisture Contents determined by ASTM D 2216		
LL	LL = F * FACTOR								
Ave.	Average						30.1%		



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 32

Plastic Limit 30

Plastic Index 2

Group Symbol ML

Multipoint Method ☒One-point Method ☐Wet Preparation ☒ Dry Preparation ☐ Air Dried ☐

Estimate the % Retained on the #40 Sieve:

Notes / Deviations / References:

ASTM D 2487: Classification of Soils for Engineering Purposes (Unified Soil Classification System)

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Mal Krajan, ET

Technical Responsibility

Signature

Laboratory Manager

Position

Date

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Liquid Limit, Plastic Limit, and Plastic Index


 Test Methods: ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐ Quality Assurance

S&ME, Inc. Raleigh, 3201 Spring Forest Road, Raleigh, North Carolina 27616

Project #: 1358-14-033 Report Date: 7/19/14

Project Name: US 264 HDD Crossings Test Date(s) 7/14 - 7/17/14

Client Name: RK&K

Client Address: 2100 East Cary Street, Suite 209, Richmond, VA 23223

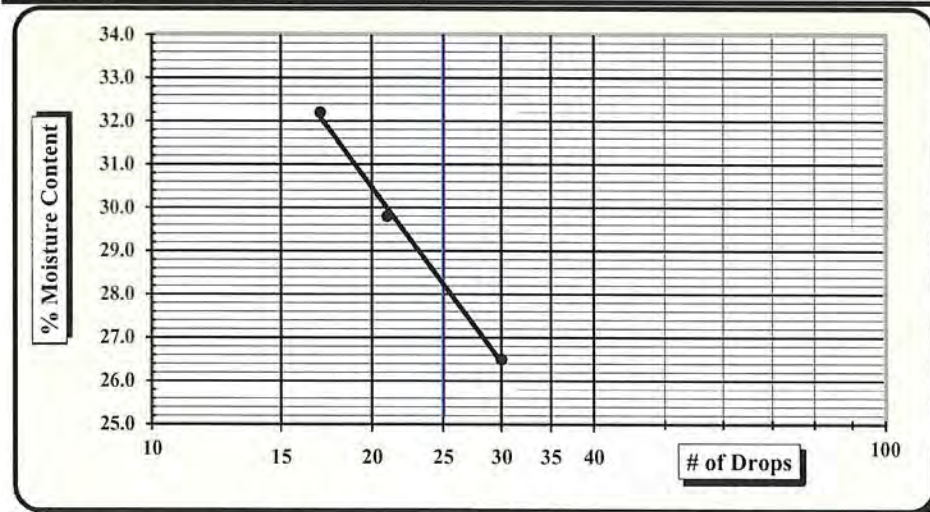
Boring #: B-2 Sample #: S-11 Sample Date: 07/02/2014

Location: Site Borehole Offset: N/A Depth (ft): 43.5 - 45 ft.

Sample Description: Gray Sandy SILT (ML)

Type and Specification	S&ME ID #	Cal Date:	Type and Specification	S&ME ID #	Cal Date:
Balance (0.01 g)	1024	11/4/2013	Grooving tool	S-1	5/20/2014
LL Apparatus	13288	8/10/2013			
Oven	1454	10/1/2013			

Pan #		Liquid Limit					Plastic Limit		
Tare #:		158	53	23			812	6	
A	Tare Weight	20.72	20.84	20.87			16.70	15.23	
B	Wet Soil Weight + A	36.05	36.30	39.80			28.19	26.20	
C	Dry Soil Weight + A	32.32	32.75	35.84			26.08	24.17	
D	Water Weight (B-C)	3.73	3.55	3.96			2.11	2.03	
E	Dry Soil Weight (C-A)	11.60	11.91	14.97			9.38	8.94	
F	% Moisture (D/E)*100	32.2%	29.8%	26.5%			22.5%	22.7%	
N	# OF DROPS	17	21	30			Moisture Contents determined by ASTM D 2216		
LL	LL = F * FACTOR								
Ave.	Average						22.6%		



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 28

Plastic Limit 23

Plastic Index 5

Group Symbol ML

Multipoint Method ☒One-point Method ☐Wet Preparation ☒ Dry Preparation ☐ Air Dried ☐ Estimate the % Retained on the #40 Sieve: 10%

Notes / Deviations / References:

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Mal Krajan, ET

Technical Responsibility

Laboratory Manager

Position

Date

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Sieve Analysis of Soils



ASTM D 6913

Quality Assurance

S&ME, Inc. Raleigh, 3201 Spring Forest Road, Raleigh, North Carolina 27616

Project #: 1358-14-033

Report Date: 07/17/2014

Project Name: US 264 HDD Crossings

Test Date(s): 07/14 - 07/16/2014

Client Name: RK&K

Client Address: 2100 East Cary Street, Suite 209, Richmond, VA 23223

Boring No.: B-3

Sample #: S-4

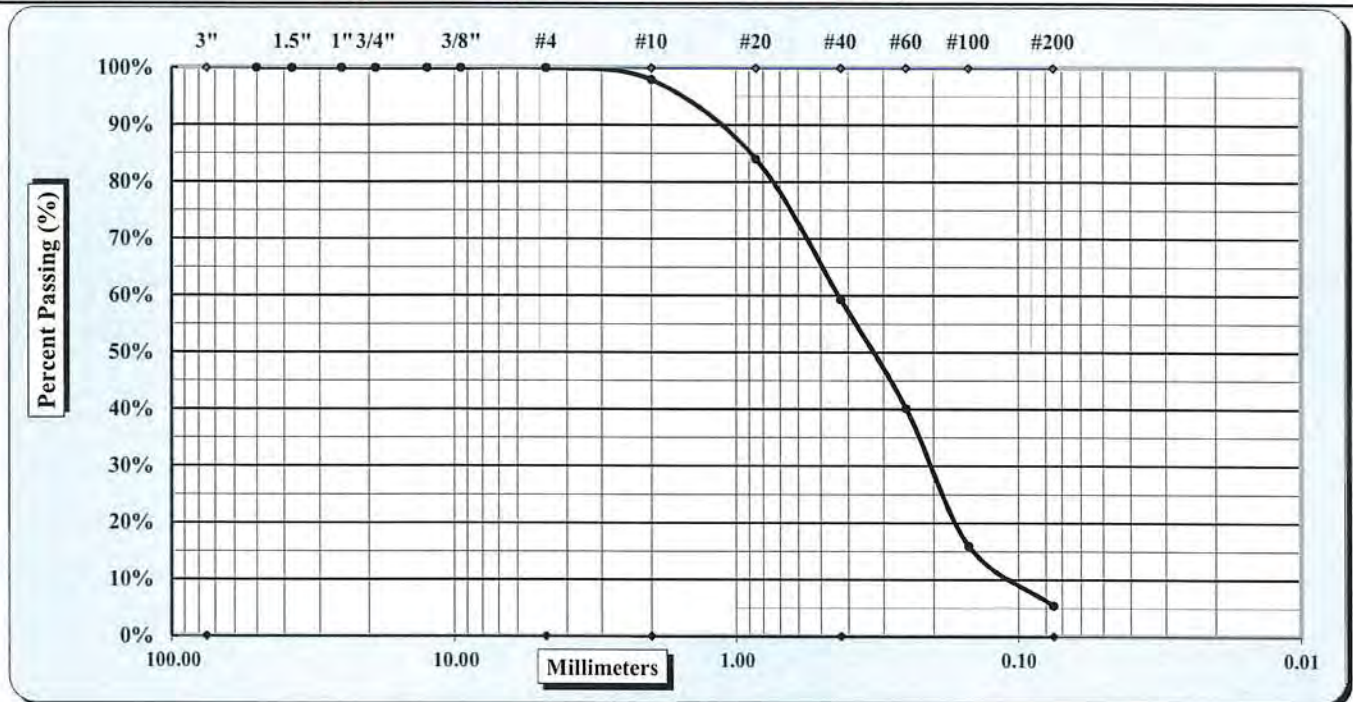
Sample Date: 07/02/2014

Location: Site-Borehole

Offset: N/A

Depth (ft): 8.5' - 10.0'

Sample Description: Gray Black Poorly Graded SAND with Silt (SP-SM)



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
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

Maximum Particle Size	#4	Coarse Sand	2.1%	Fine Sand	53.9%

Gravel	0.0%	Medium Sand	38.6%	Silt & Clay	5.4%

Liquid Limit	ND	Plastic Limit	ND	Plastic Index	ND

Specific Gravity	ND	Moisture Content	23.5%

Coarse Sand	2.1%	Medium Sand	38.6%	Fine Sand	53.9%

Description of Sand & Gravel Particles:	Rounded	☐	Angular	☒

Hard & Durable	☒	Soft	☐	Weathered & Friable	☐

Notes / Deviations / References: ND=Not Determined.

Mal Krajan, ET
Technical Responsibility

Signature

Laboratory Manager
Position

Date

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Liquid Limit, Plastic Limit, and Plastic Index


 Test Methods: ☒ ASTM D 4318 ☐ AASHTO T 89 ☐ AASHTO T 90 ☐ Quality Assurance

S&ME, Inc. Raleigh, 3201 Spring Forest Road, Raleigh, North Carolina 27616

Project #: 1358-14-033 Report Date: 7/19/14

Project Name: US 264 HDD Crossings Test Date(s): 7/14 - 7/17/14

Client Name: RK&K

Client Address: 2100 East Cary Street, Suite 209, Richmond, VA 23223

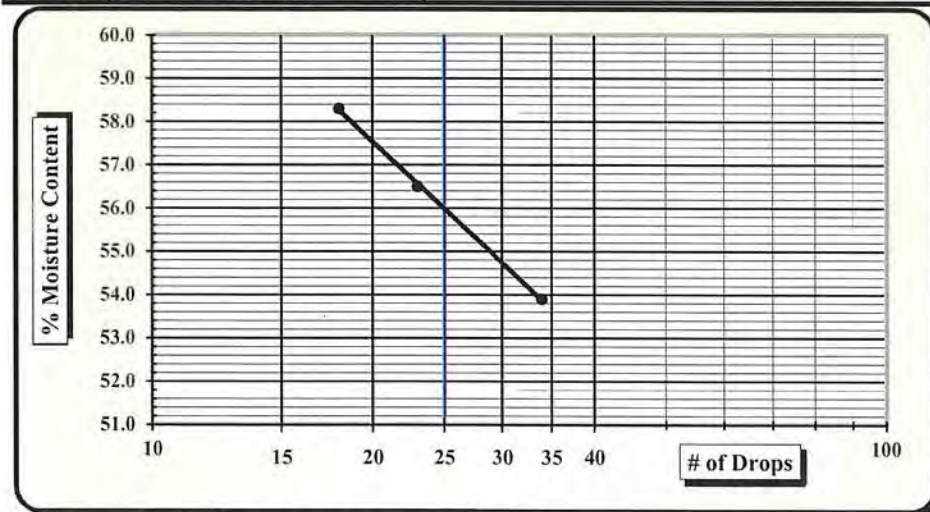
Boring #: B-3 Sample #: S-5 Sample Date: 07/02/2014

Location: Site Borehole Offset: N/A Depth (ft): 13.5 - 15 ft.

Sample Description: Gray Black Sandy Fat CLAY (CH)

Type and Specification	S&ME ID #	Cal Date:	Type and Specification	S&ME ID #	Cal Date:
Balance (0.01 g)	1024	11/4/2013	Grooving tool	S-1	5/20/2014
LL Apparatus	13288	8/10/2013			
Oven	1454	10/1/2013			

Pan #		Liquid Limit					Plastic Limit		
Tare #:		802	803	55			11	8	
A	Tare Weight	16.75	16.71	15.23			12.48	12.99	
B	Wet Soil Weight + A	30.65	29.17	29.10			23.42	21.98	
C	Dry Soil Weight + A	25.78	24.67	23.99			21.18	20.18	
D	Water Weight (B-C)	4.87	4.50	5.11			2.24	1.80	
E	Dry Soil Weight (C-A)	9.03	7.96	8.76			8.70	7.19	
F	% Moisture (D/E)*100	53.9%	56.5%	58.3%			25.7%	25.0%	
N	# OF DROPS	34	23	18			Moisture Contents determined by ASTM D 2216		
LL	LL = F * FACTOR								
Ave.	Average						25.4%		



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 56

Plastic Limit 25

Plastic Index 31

Group Symbol CH

Multipoint Method ☒One-point Method ☐Wet Preparation ☒ Dry Preparation ☐ Air Dried ☐ Estimate the % Retained on the #40 Sieve: 0%

Notes / Deviations / References:

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Mal Krajan, ET

Technical Responsibility

Laboratory Manager

Position

Date

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Sieve Analysis of Soils



ASTM D 6913

Quality Assurance

S&ME, Inc. Raleigh, 3201 Spring Forest Road, Raleigh, North Carolina 27616

Project #: 1358-14-033

Report Date: 07/17/2014

Project Name: US 264 HDD Crossings

Test Date(s): 07/14 - 07/16/2014

Client Name: RK&K

Client Address: 2100 East Cary Street, Suite 209, Richmond, VA 23223

Boring No.: B-3

Sample: S-10

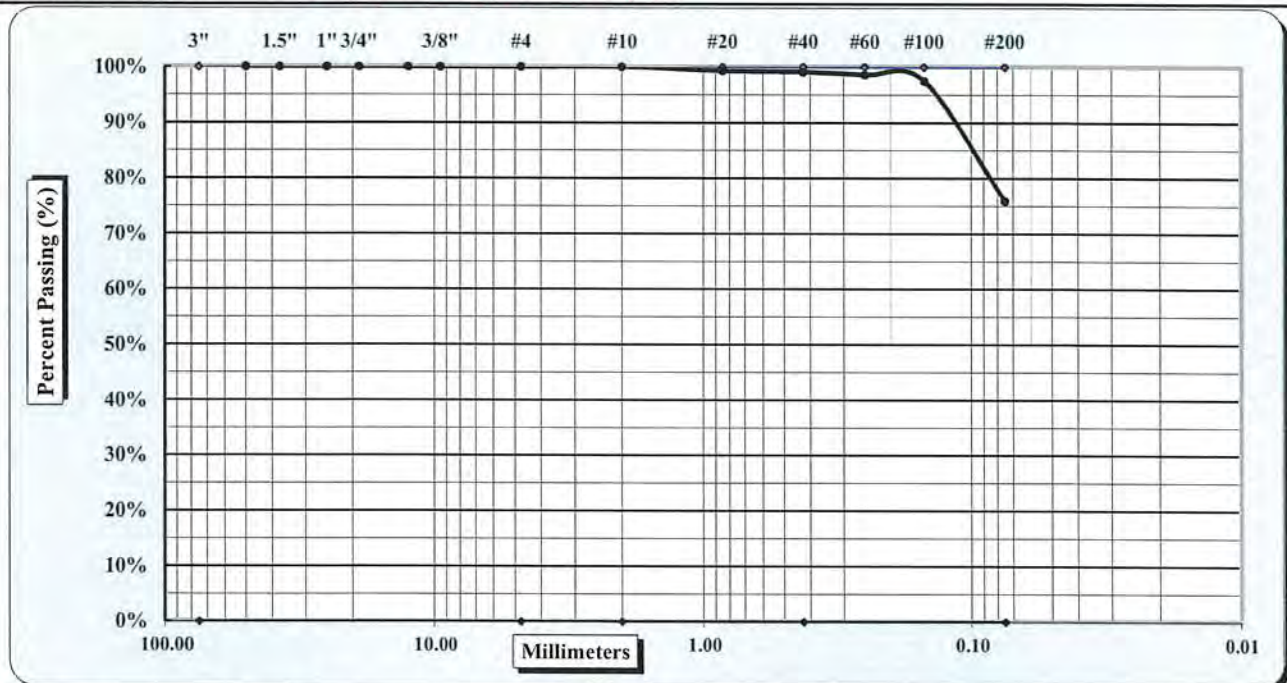
Sample Date: 07/03/2014

Location: Site-Borehole

Offset: N/A

Depth (ft): 38.5' - 40.0'

Sample Description: Gray Black Sandy Fat CLAY (CH)



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
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

Maximum Particle Size	#10	Coarse Sand	0.0%	Fine Sand	23.2%
Gravel	0.0%	Medium Sand	0.9%	Silt & Clay	75.9%
Liquid Limit	57	Plastic Limit	23	Plastic Index	34
Specific Gravity	ND			Moisture Content	30.3%
Coarse Sand	0.0%	Medium Sand	0.9%	Fine Sand	23.2%

Description of Sand & Gravel Particles: Rounded ☐ Angular ☒
 Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

Notes / Deviations / References:

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

ASTM D 2487: Classification of Soils for Engineering Purposes (Unified Soil Classification System)

Mal Krajan, ET

Technical Responsibility

Signature

Laboratory Manager

Position

Date

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Liquid Limit, Plastic Limit, and Plastic Index



S&ME, Inc. Raleigh, 3201 Spring Forest Road, Raleigh, North Carolina 27616

Project #: 1358-14-033

Report Date: 07/17/2014

Project Name: US 264 HDD Crossings

Test Date(s) 07/14 - 07/16/2014

Client Name: RK&K

Client Address: 2100 East Cary Street, Suite 209, Richmond, VA 23223

Boring #: B-3

Sample #: S-10

Sample Date: 07/03/2014

Location: Site-Borehole

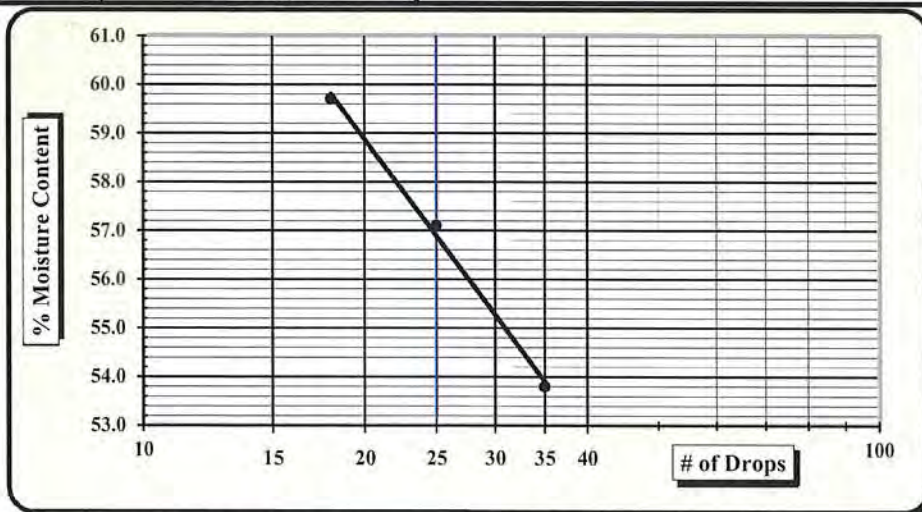
Offset: N/A

Depth (ft): 38.5' - 40.0'

Sample Description: Gray Black Sandy Fat CLAY (CH)

Type and Specification	S&ME ID #	Cal Date:	Type and Specification	S&ME ID #	Cal Date:
Balance (0.01 g)	1024	11/4/2013	Grooving tool	S-1	5/20/2014
LL Apparatus	13288	8/10/2013			
Oven	1454	10/1/2013			

Pan #	Tare #:	Liquid Limit					Plastic Limit		
		9	806	10			809	807	
A	Tare Weight	15.30	16.58	11.01			16.70	16.73	
B	Wet Soil Weight + A	26.94	29.32	21.42			25.17	27.25	
C	Dry Soil Weight + A	22.87	24.69	17.53			23.63	25.25	
D	Water Weight (B-C)	4.07	4.63	3.89			1.54	2.00	
E	Dry Soil Weight (C-A)	7.57	8.11	6.52			6.93	8.52	
F	% Moisture (D/E)*100	53.8%	57.1%	59.7%			22.2%	23.5%	
N	# OF DROPS	35	25	18			Moisture Contents determined by ASTM D 2216		
LL	LL = F * FACTOR								
Ave.	Average						22.9%		



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 57

Plastic Limit 23

Plastic Index 34

Group Symbol CH

Multipoint Method ☒One-point Method ☐Wet Preparation ☒Dry Preparation ☐Air Dried ☐

Estimate the % Retained on the #40 Sieve:

Notes / Deviations / References:

ASTM D 2487: Classification of Soils for Engineering Purposes (Unified Soil Classification System)

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Mal Krajan, ET

Technical Responsibility

Signature

Laboratory Manager

Position

Date

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Sieve Analysis of Soils

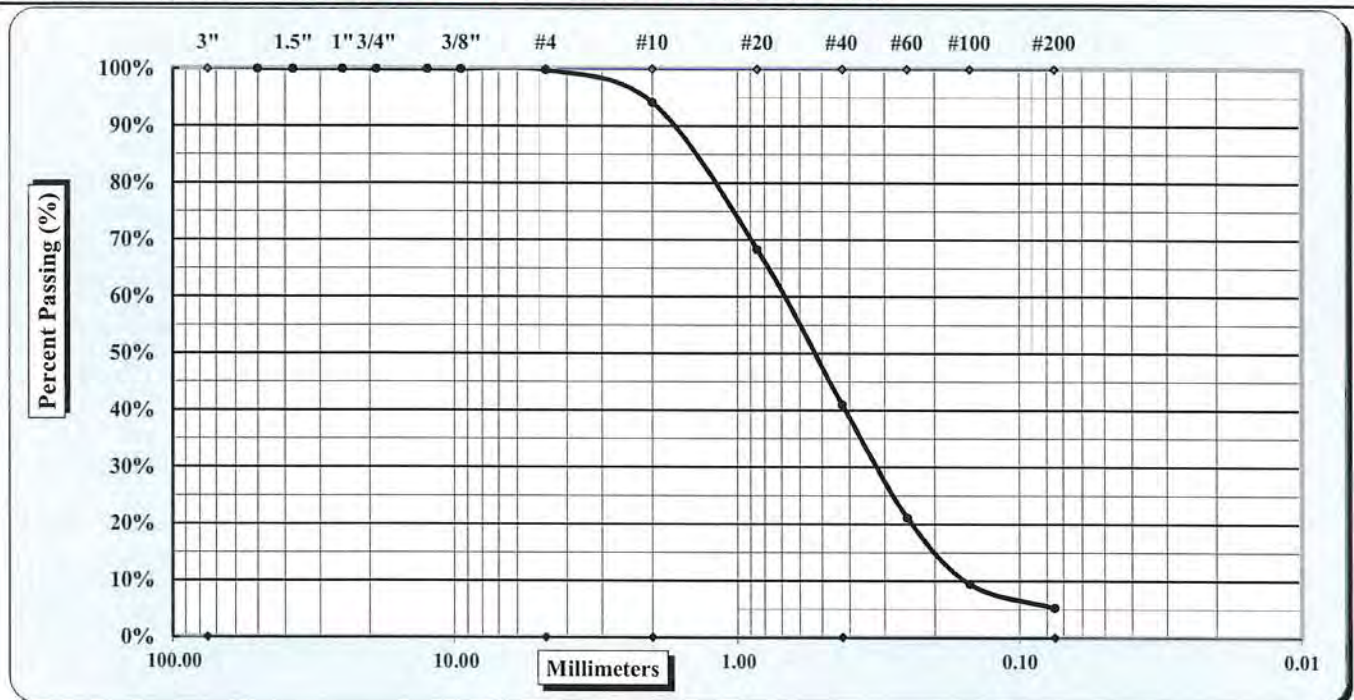


ASTM D 6913

Quality Assurance

S&ME, Inc. Raleigh, 3201 Spring Forest Road, Raleigh, North Carolina 27616

Project #:	1358-14-033	Report Date:	07/17/2014
Project Name:	US 264 HDD Crossings	Test Date(s):	07/14 - 07/16/2014
Client Name:	RK&K		
Client Address:	2100 East Cary Street, Suite 209, Richmond, VA 23223		
Boring No.:	B-4	Sample #:	S-2
		Sample Date:	07/03/2014
Location:	Site-Borehole	Offset:	N/A
		Depth (ft):	3.5' - 5.0'
Sample Description:	Gray Tan Poorly Graded SAND with Silt (SP-SM)		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
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

Maximum Particle Size	3/8"	Coarse Sand	5.7%	Fine Sand	35.8%

Gravel	0.2%	Medium Sand	53.1%	Silt & Clay	5.2%

Liquid Limit	ND	Plastic Limit	ND	Plastic Index	ND

Specific Gravity	ND	Moisture Content	17.4%

Coarse Sand	5.7%	Medium Sand	53.1%	Fine Sand	35.8%

Description of Sand & Gravel Particles:	Rounded	☐	Angular	☒

Hard & Durable	☒	Soft	☐	Weathered & Friable	☐

Notes / Deviations / References: ND=Not Determined.

Mal Krajan, ET

Technical Responsibility

Laboratory Manager

Position

Date

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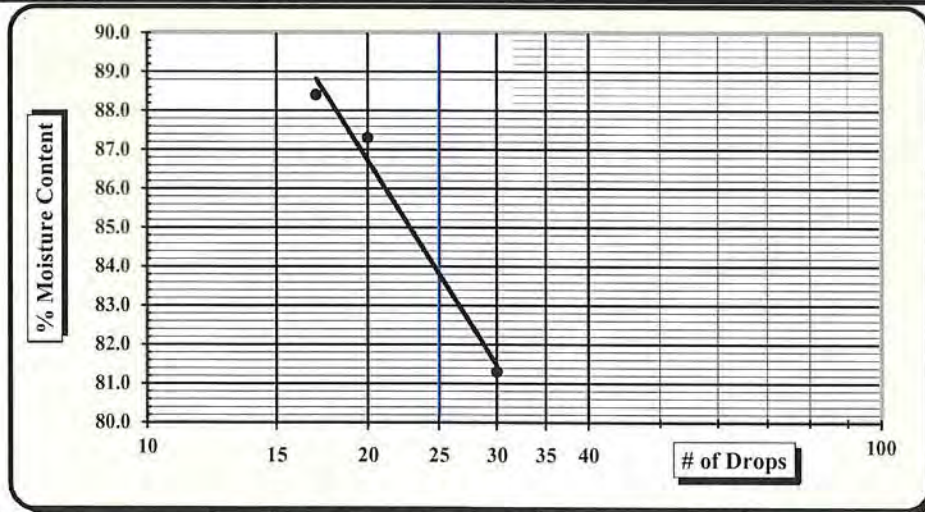
Liquid Limit, Plastic Limit, and Plastic Index


 Test Methods: ☒ ASTM D 4318 ☐ AASHTO T 89 ☐ AASHTO T 90 ☐ Quality Assurance

S&ME, Inc. Raleigh, 3201 Spring Forest Road, Raleigh, North Carolina 27616

Project #:	1358-14-033	Report Date:	7/19/14
Project Name:	US 264 HDD Crossings	Test Date(s)	7/14 - 7/17/14
Client Name:	RK&K		
Client Address:	2100 East Cary Street, Suite 209, Richmond, VA 23223		
Boring #:	B-4	Sample #:	S-3
		Sample Date:	07/03/2014
Location:	Site Borehole	Offset:	N/A
		Depth (ft):	6 - 7.5 ft.
Sample Description:	Gray Black Elastic SILT (MH)		
Type and Specification	S&ME ID #	Cal Date:	Type and Specification
Balance (0.01 g)	1024	11/4/2013	Grooving tool
LL Apparatus	13288	8/10/2013	S-1
Oven	1454	10/1/2013	5/20/2014

Pan #	Tare #:	Liquid Limit					Plastic Limit		
		98	13	12			51	1	
A	Tare Weight	20.91	20.86	21.00			20.86	20.88	
B	Wet Soil Weight + A	32.43	32.90	33.09			28.63	29.82	
C	Dry Soil Weight + A	27.06	27.25	27.67			26.46	27.40	
D	Water Weight (B-C)	5.37	5.65	5.42			2.17	2.42	
E	Dry Soil Weight (C-A)	6.15	6.39	6.67			5.60	6.52	
F	% Moisture (D/E)*100	87.3%	88.4%	81.3%			38.8%	37.1%	
N	# OF DROPS	20	17	30			Moisture Contents determined by ASTM D 2216		
LL	LL = F * FACTOR								
Ave.	Average						38.0%		



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 **84**Plastic Limit **38**Plastic Index **46**Group Symbol **MH**Multipoint Method ☒One-point Method ☐Wet Preparation ☒ Dry Preparation ☐ Air Dried ☐ Estimate the % Retained on the #40 Sieve: 0%

Notes / Deviations / References:

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Mal Krajan, ET

Technical Responsibility

Signature

Laboratory Manager

Position

Date

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Sieve Analysis of Soils



ASTM D 6913

Quality Assurance

S&ME, Inc. Raleigh, 3201 Spring Forest Road, Raleigh, North Carolina 27616

Project #: 1358-14-033

Report Date: 07/17/2014

Project Name: US 264 HDD Crossings

Test Date(s): 07/14 - 07/16/2014

Client Name: RK&K

Client Address: 2100 East Cary Street, Suite 209, Richmond, VA 23223

Boring No.: B-4

Sample: S-8

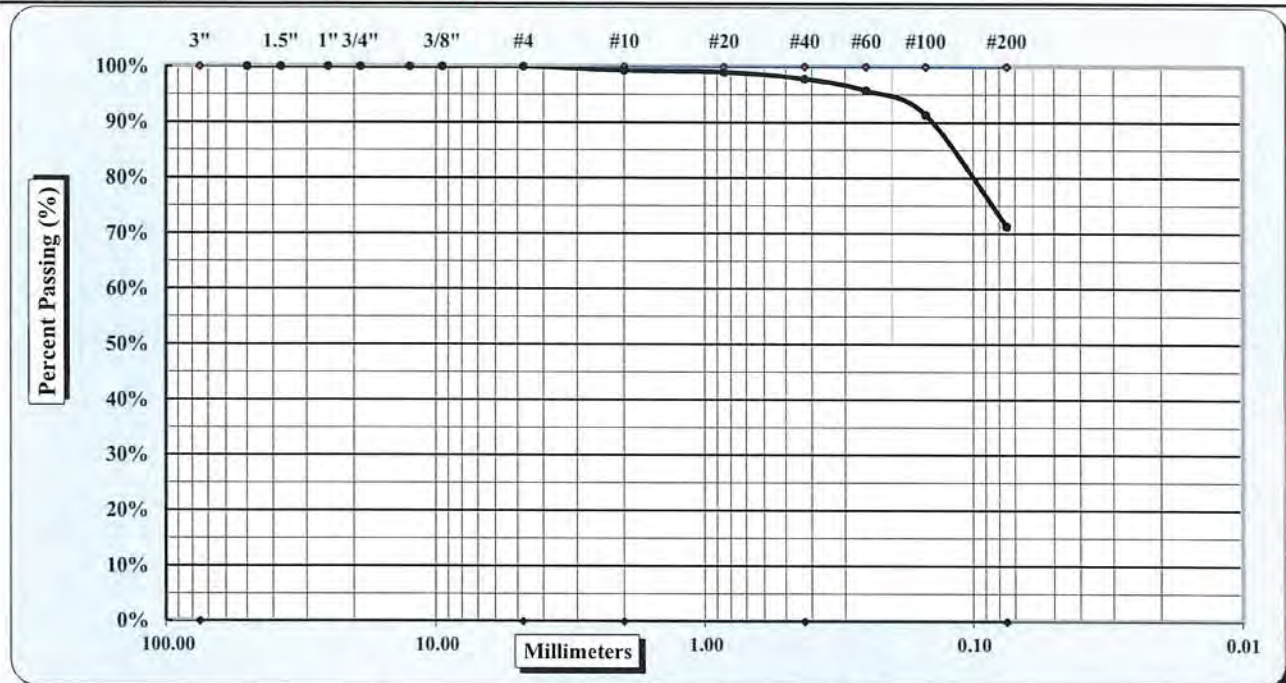
Sample Date: 07/03/2014

Location: Site-Borehole

Offset: N/A

Depth (ft): 28.5' - 30.0'

Sample Description: Gray Fat Sandy CLAY (CH)



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
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

Maximum Particle Size	#4	Coarse Sand	0.7%	Fine Sand	26.5%
Gravel	0.0%	Medium Sand	1.5%	Silt & Clay	71.3%
Liquid Limit	61	Plastic Limit	22	Plastic Index	39
Specific Gravity	ND			Moisture Content	29.3%
Coarse Sand	0.7%	Medium Sand	1.5%	Fine Sand	26.5%

Description of Sand & Gravel Particles:				Rounded	☐	Angular	☐
Hard & Durable	☐	Soft	☐			Weathered & Friable	☐

Notes / Deviations / References:

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

ASTM D 2487: Classification of Soils for Engineering Purposes (Unified Soil Classification System)

Mal Krajan, ET

Technical Responsibility

Laboratory Manager

Position

Date

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Liquid Limit, Plastic Limit, and Plastic Index



Test Methods.

ASTM D 4318



AASHTO T 89



AASHTO T 90



Quality Assurance

S&ME, Inc. Raleigh, 3201 Spring Forest Road, Raleigh, North Carolina 27616

Project #: 1358-14-033

Report Date: 07/17/2014

Project Name: US 264 HDD Crossings

Test Date(s) 07/14 - 07/16/2014

Client Name: RK&K

Client Address: 2100 East Cary Street, Suite 209, Richmond, VA 23223

Boring #: B-4

Sample #: S-8

Sample Date: 07/03/2014

Location: Site-Borehole

Offset: N/A

Depth (ft): 28.5' - 30.0'

Sample Description: Gray Fat Sandy CLAY (CH)

Type and Specification

S&ME ID #

Cal Date:

Type and Specification

S&ME ID #

Cal Date:

Balance (0.01 g)

1024

11/4/2013

Grooving tool

S-1

5/20/2014

LL Apparatus

13288

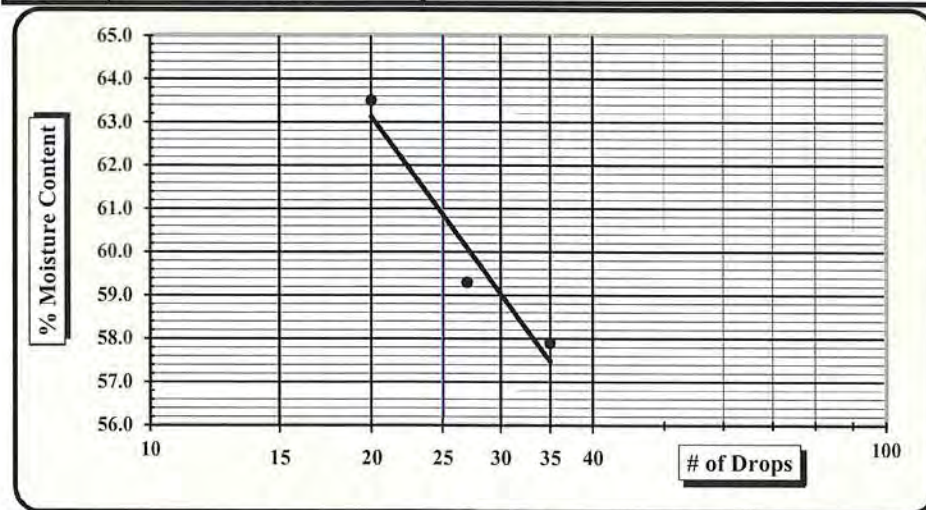
8/10/2013

Oven

1454

10/1/2013

Pan #	Tare #:	Liquid Limit					Plastic Limit		
		19	10	3			22	14	
A	Tare Weight	13.00	13.06	13.04			13.06	12.96	
B	Wet Soil Weight + A	25.41	26.60	24.81			22.25	20.94	
C	Dry Soil Weight + A	20.86	21.56	20.24			20.54	19.52	
D	Water Weight (B-C)	4.55	5.04	4.57			1.71	1.42	
E	Dry Soil Weight (C-A)	7.86	8.50	7.20			7.48	6.56	
F	% Moisture (D/E)*100	57.9%	59.3%	63.5%			22.9%	21.6%	
N	# OF DROPS	35	27	20			Moisture Contents determined by ASTM D 2216		
LL	LL = F * FACTOR								
Ave.	Average						22.3%		



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 61

Plastic Limit 22

Plastic Index 39

Group Symbol CH

Multipoint Method ☒One-point Method ☐Wet Preparation ☒Dry Preparation ☐Air Dried ☐

Estimate the % Retained on the #40 Sieve:

Notes / Deviations / References:

ASTM D 2487: Classification of Soils for Engineering Purposes (Unified Soil Classification System)

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Mal Krajan, ET

Technical Responsibility

Signature

Laboratory Manager

Position

Date

This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Liquid Limit, Plastic Limit, and Plastic Index


 Test Methods: ☒ ASTM D 4318 ☐ AASHTO T 89 ☐ AASHTO T 90 ☐ Quality Assurance

S&ME, Inc. Raleigh, 3201 Spring Forest Road, Raleigh, North Carolina 27616

Project #: 1358-14-033 Report Date: 7/19/14

Project Name: US 264 HDD Crossings Test Date(s): 7/14 - 7/17/14

Client Name: RK&K

Client Address: 2100 East Cary Street, Suite 209, Richmond, VA 23223

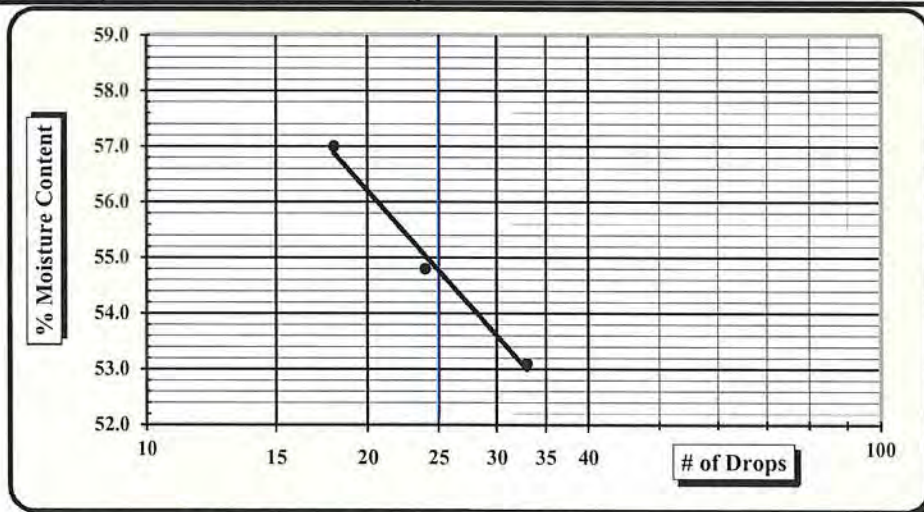
Boring #: B-4 Sample #: S-10 Sample Date: 07/03/2014

Location: Site Borehole Offset: N/A Depth (ft): 38.5 - 40 ft.

Sample Description: Gray Black Fat Sandy CLAY (CH)

Type and Specification	S&ME ID #	Cal Date:	Type and Specification	S&ME ID #	Cal Date:
Balance (0.01 g)	1024	11/4/2013	Grooving tool	S-1	5/20/2014
LL Apparatus	13288	8/10/2013			
Oven	1454	10/1/2013			

Pan #	Tare #:	Liquid Limit					Plastic Limit		
		2	15	107			16	58	
A	Tare Weight	21.04	20.71	21.01			21.02	20.58	
B	Wet Soil Weight + A	35.03	34.81	34.94			32.58	31.97	
C	Dry Soil Weight + A	30.18	29.82	29.88			30.31	29.77	
D	Water Weight (B-C)	4.85	4.99	5.06			2.27	2.20	
E	Dry Soil Weight (C-A)	9.14	9.11	8.87			9.29	9.19	
F	% Moisture (D/E)*100	53.1%	54.8%	57.0%			24.4%	23.9%	
N	# OF DROPS	33	24	18			Moisture Contents determined by ASTM D 2216		
LL	LL = F * FACTOR								
Ave.	Average						24.2%		



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 55

Plastic Limit 24

Plastic Index 31

Group Symbol CH

Multipoint Method ☒One-point Method ☐Wet Preparation ☒ Dry Preparation ☐ Air Dried ☐ Estimate the % Retained on the #40 Sieve: 0%

Notes / Deviations / References:

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Mal Krajan, ET

Technical Responsibility

Signature

Laboratory Manager

Position

Date

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Sieve Analysis of Soils



ASTM D 6913

Quality Assurance

S&ME, Inc. Raleigh, 3201 Spring Forest Road, Raleigh, North Carolina 27616

Project #: 1358-14-033

Report Date: 07/17/2014

Project Name: US 264 HDD Crossingd

Test Date(s): 07/14 - 07/16/2014

Client Name: RK&K

Client Address: 2100 East Cary Street, Suite 209, Richmond, VA 23223

Boring No.: B-5

Sample #: S-4

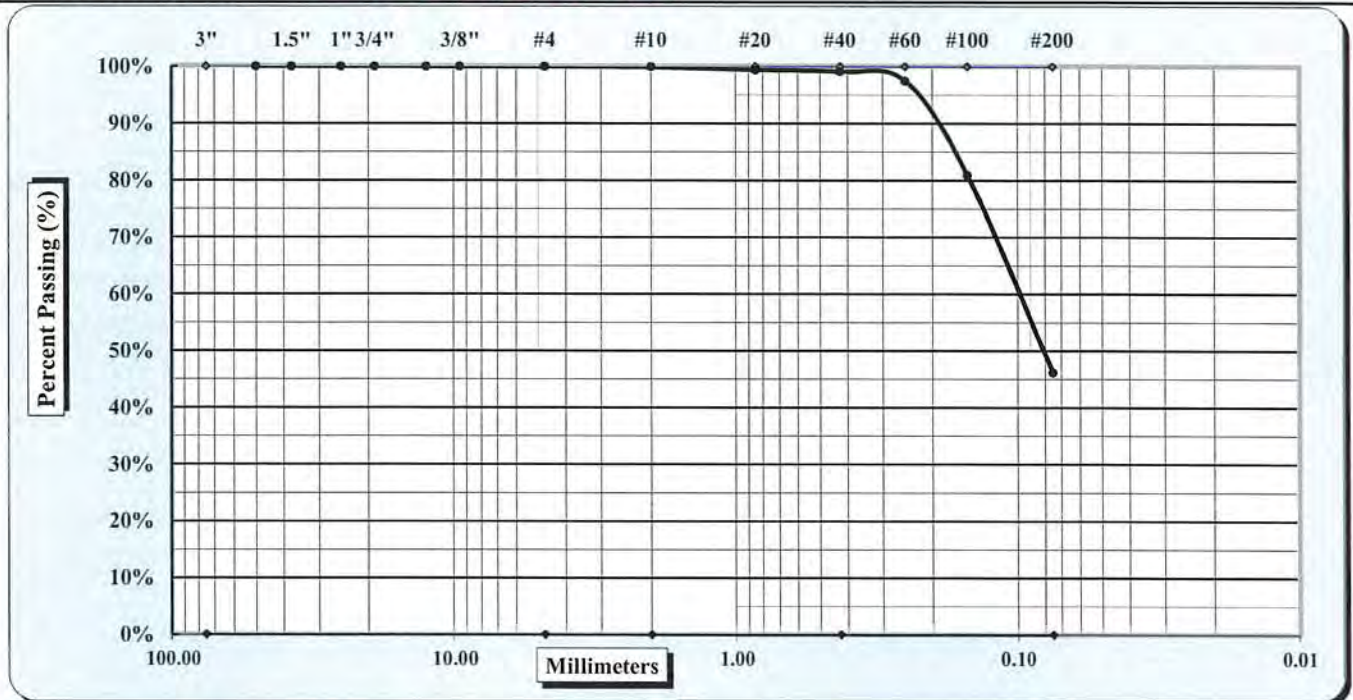
Sample Date: 07/03/2014

Location: Site-Borehole

Offset: N/A

Depth (ft): 8.5' - 10.0'

Sample Description: Orange Tan Clayey SAND (SC)



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
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

Maximum Particle Size	#4	Coarse Sand	0.1%	Fine Sand	52.9%

Gravel	0.0%	Medium Sand	0.8%	Silt & Clay	46.2%

Liquid Limit	ND	Plastic Limit	ND	Plastic Index	ND

Specific Gravity	ND	Moisture Content	40.2%

Coarse Sand	0.1%	Medium Sand	0.8%	Fine Sand	52.9%

Description of Sand & Gravel Particles:	Rounded	☐	Angular	☒

Hard & Durable	☒	Soft	☐	Weathered & Friable	☐

Notes / Deviations / References: ND=Not Determined.

Mal Krajan, ET

Technical Responsibility

Laboratory Manager

Position

Date

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Sieve Analysis of Soils



ASTM D 6913

Quality Assurance

S&ME, Inc. Raleigh, 3201 Spring Forest Road, Raleigh, North Carolina 27616

Project #: 1358-14-033

Report Date: 07/17/2014

Project Name: US 264 HDD Crossings

Test Date(s): 07/14 - 07/16/2014

Client Name: RK&K

Client Address: 2100 East Cary Street, Suite 209, Richmond, VA 23223

Boring No.: B-5

Sample #: S-6

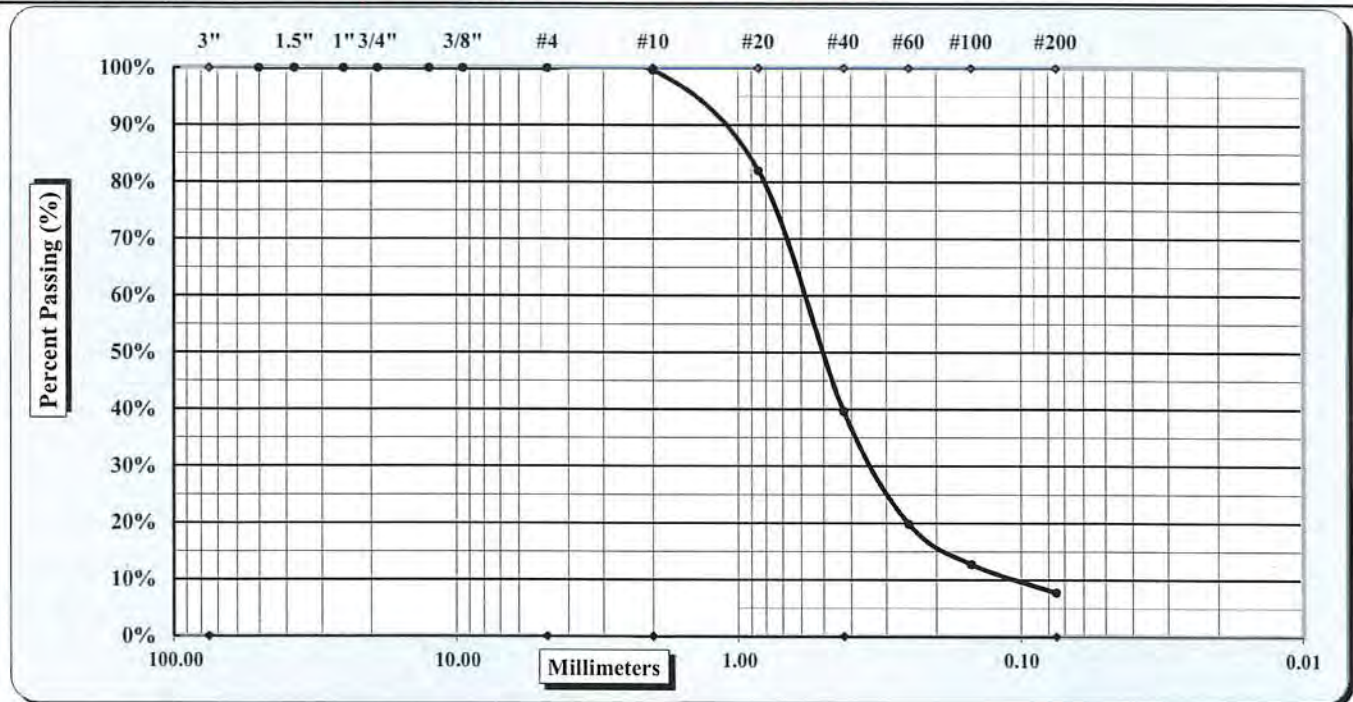
Sample Date: 07/03/2014

Location: Site-Borehole

Offset: N/A

Depth (ft): 18.5' - 20.0'

Sample Description: Gray Tan Poorly Graded SAND with Silt (SP-SM)



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
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

Maximum Particle Size	#4	Coarse Sand	0.4%	Fine Sand	31.9%

Gravel	0.0%	Medium Sand	60.0%	Silt & Clay	7.7%

Liquid Limit	ND	Plastic Limit	ND	Plastic Index	ND

Specific Gravity	ND	Moisture Content	16.8%

Coarse Sand	0.4%	Medium Sand	60.0%	Fine Sand	31.9%

Description of Sand & Gravel Particles:	Rounded	☐	Angular	☒

Hard & Durable	☒	Soft	☐	Weathered & Friable	☐

Notes / Deviations / References: ND=Not Determined.

Mal Krajan, ET

Technical Responsibility

Laboratory Manager

Position

Date

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Liquid Limit, Plastic Limit, and Plastic Index


 Test Methods: ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐ Quality Assurance

S&ME, Inc. Raleigh, 3201 Spring Forest Road, Raleigh, North Carolina 27616

Project #: 1358-14-033 Report Date: 7/19/14

Project Name: US 264 HDD Crossings Test Date(s) 7/14 - 7/17/14

Client Name: RK&K

Client Address: 2100 East Cary Street, Suite 209, Richmond, VA 23223

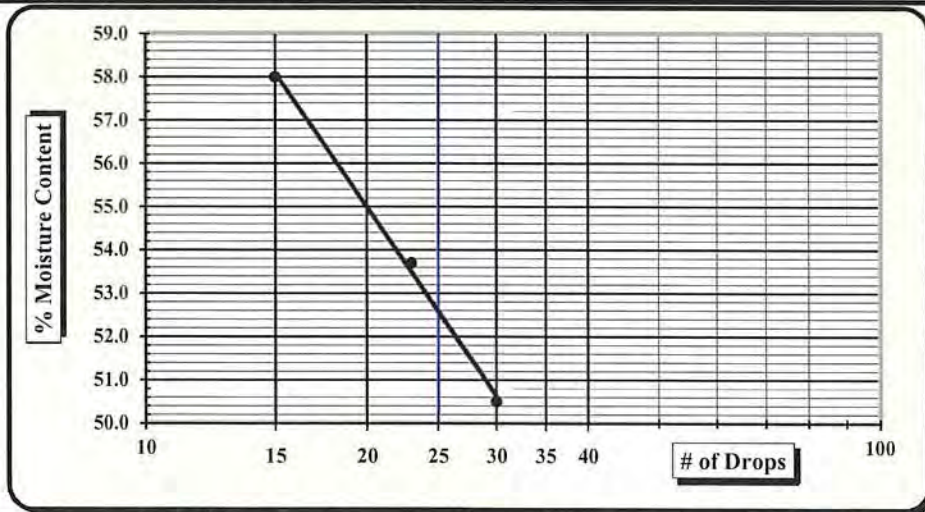
Boring #: B-5 Sample #: S-7 Sample Date: 07/03/2014

Location: Site Borehole Offset: N/A Depth (ft): 23.5 - 25 ft.

Sample Description: Gray Olive Fat CLAY (CH)

Type and Specification	S&ME ID #	Cal Date:	Type and Specification	S&ME ID #	Cal Date:
Balance (0.01 g)	1024	11/4/2013	Grooving tool	S-1	5/20/2014
LL Apparatus	13288	8/10/2013			
Oven	1454	10/1/2013			

Pan #	Tare #:	Liquid Limit					Plastic Limit		
		13	21	25			5	2	
A	Tare Weight	13.09	12.94	12.94			12.50	11.10	
B	Wet Soil Weight + A	27.94	26.82	24.54			20.77	20.36	
C	Dry Soil Weight + A	22.49	21.97	20.65			18.99	18.41	
D	Water Weight (B-C)	5.45	4.85	3.89			1.78	1.95	
E	Dry Soil Weight (C-A)	9.40	9.03	7.71			6.49	7.31	
F	% Moisture (D/E)*100	58.0%	53.7%	50.5%			27.4%	26.7%	
N	# OF DROPS	15	23	30			Moisture Contents determined by ASTM D 2216		
LL	LL = F * FACTOR								
Ave.	Average						27.1%		



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 53

Plastic Limit 27

Plastic Index 26

Group Symbol CH

Multipoint Method ☒One-point Method ☐Wet Preparation ☒ Dry Preparation ☐ Air Dried ☐ Estimate the % Retained on the #40 Sieve: 1%

Notes / Deviations / References:

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

 Mal Krajan, ET
 Technical Responsibility

Signature

 Laboratory Manager
 Position

Date

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Sieve Analysis of Soils



ASTM D 6913

Quality Assurance

S&ME, Inc. Raleigh, 3201 Spring Forest Road, Raleigh, North Carolina 27616

Project #: 1358-14-033

Report Date: 07/17/2014

Project Name: US 264 HDD Crossings

Test Date(s): 07/14 - 07/16/2014

Client Name: RK&K

Client Address: 2100 East Cary Street, Suite 209, Richmond, VA 23223

Boring No.: B-5

Sample: S-9

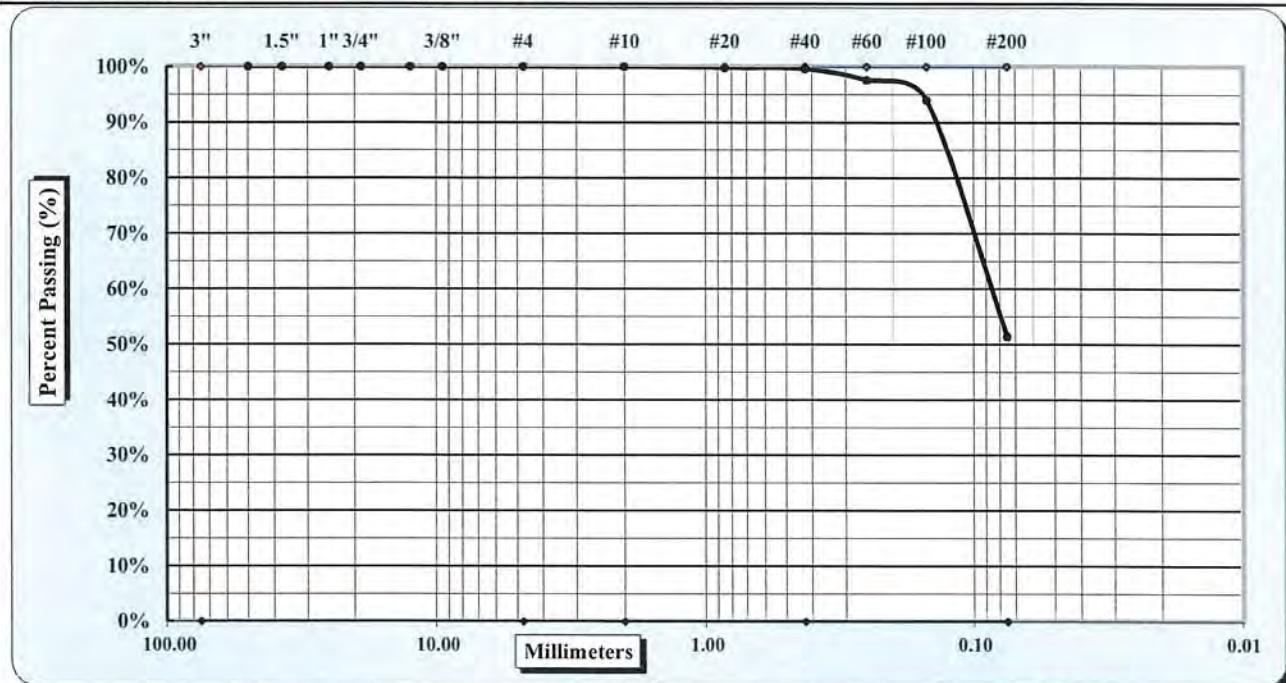
Sample Date: 07/03/2014

Location: Site-Borehole

Offset: N/A

Depth (ft): 33.5' - 35.0'

Sample Description: Gray Sandy CLAY (CH)



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
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

Maximum Particle Size	#4	Coarse Sand	0.0%	Fine Sand	48.2%
Gravel	0.0%	Medium Sand	0.4%	Silt & Clay	51.4%
Liquid Limit	55	Plastic Limit	26	Plastic Index	29
Specific Gravity	ND			Moisture Content	44.3%
Coarse Sand	0.0%	Medium Sand	0.4%	Fine Sand	48.2%

Description of Sand & Gravel Particles: Rounded ☐ Angular ☒
 Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

Notes / Deviations / References:

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

ASTM D 2487: Classification of Soils for Engineering Purposes (Unified Soil Classification System)

Mal Krajan, ET

Technical Responsibility

Laboratory Manager

Position

Date

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Liquid Limit, Plastic Limit, and Plastic Index



Test Methods.

ASTM D 4318



AASHTO T 89



AASHTO T 90



Quality Assurance

S&ME, Inc. Raleigh, 3201 Spring Forest Road, Raleigh, North Carolina 27616

Project #: 1358-14-033

Report Date: 07/17/2014

Project Name: US 264 HDD Crossings

Test Date(s) 07/14 - 07/16/2014

Client Name: RK&K

Client Address: 2100 East Cary Street, Suite 209, Richmond, VA 23223

Boring #: B-5

Sample #: S-9

Sample Date: 07/03/2014

Location: Site-Borehole

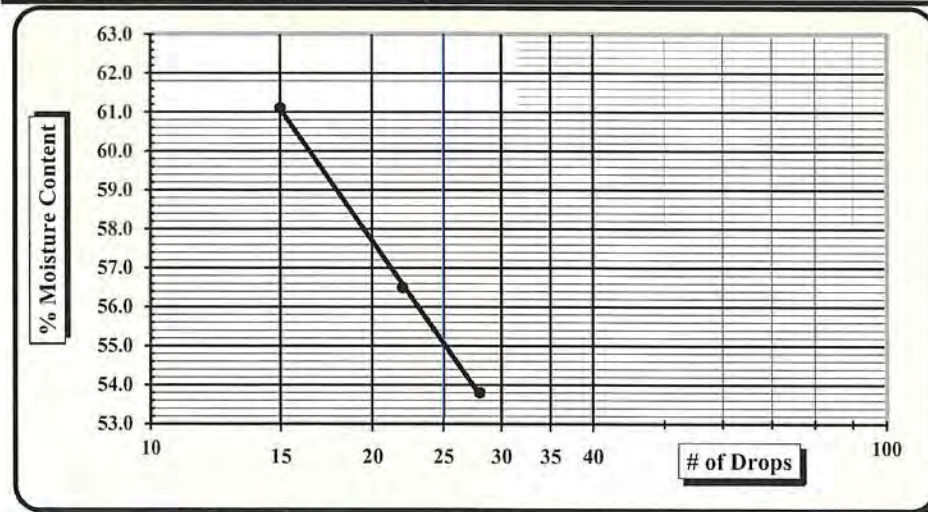
Offset: N/A

Depth (ft): 33.5' - 35.0'

Sample Description: Gray Sandy CLAY (CH)

Type and Specification	S&ME ID #	Cal Date:	Type and Specification	S&ME ID #	Cal Date:
Balance (0.01 g)	1024	11/4/2013	Grooving tool	S-1	5/20/2014
LL Apparatus	13288	8/10/2013			
Oven	1454	10/1/2013			

Pan #	Tare #:	Liquid Limit					Plastic Limit		
		4	2	26			6	15	
A	Tare Weight	10.97	12.97	12.90			12.97	12.41	
B	Wet Soil Weight + A	23.49	25.82	24.74			20.87	23.95	
C	Dry Soil Weight + A	18.74	21.18	20.60			19.24	21.58	
D	Water Weight (B-C)	4.75	4.64	4.14			1.63	2.37	
E	Dry Soil Weight (C-A)	7.77	8.21	7.70			6.27	9.17	
F	% Moisture (D/E)*100	61.1%	56.5%	53.8%			26.0%	25.8%	
N	# OF DROPS	15	22	28			Moisture Contents determined by ASTM D 2216		
LL	LL = F * FACTOR								
Ave.	Average						25.9%		



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 55

Plastic Limit 26

Plastic Index 29

Group Symbol CH

Multipoint Method ☒One-point Method ☐Wet Preparation ☒Dry Preparation ☐Air Dried ☐

Estimate the % Retained on the #40 Sieve:

Notes / Deviations / References:

ASTM D 2487: Classification of Soils for Engineering Purposes (Unified Soil Classification System)

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Mal Krajan, ET

Technical Responsibility

Signature

Laboratory Manager

Position

Date

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Sieve Analysis of Soils

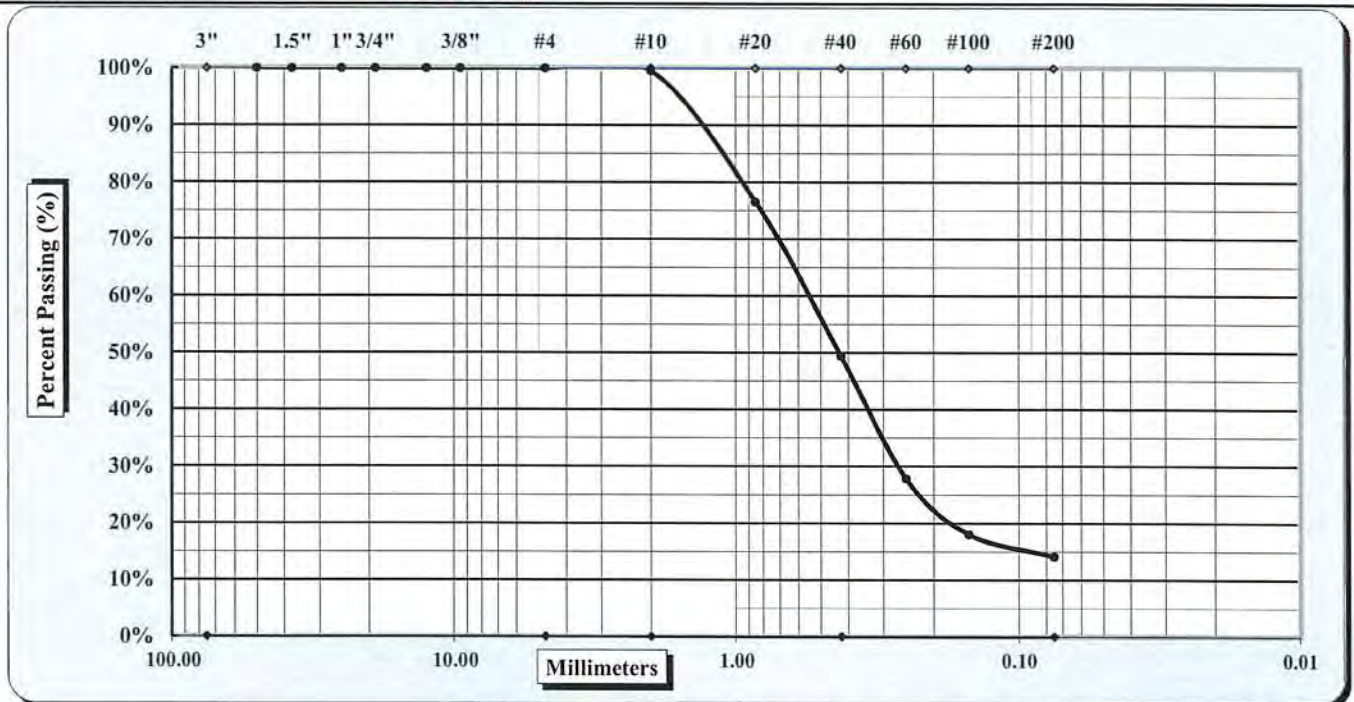


ASTM D 6913

Quality Assurance

S&ME, Inc. Raleigh, 3201 Spring Forest Road, Raleigh, North Carolina 27616

Project #:	1358-14-033	Report Date:	07/17/2014
Project Name:	US 264 HDD Crossings	Test Date(s):	07/14 - 07/16/2014
Client Name:	RK&K		
Client Address:	2100 East Cary Street, Suite 209, Richmond, VA 23223		
Boring No.:	B-6	Sample #:	S-5
		Sample Date:	07/08/2014
Location:	Site-Borehole	Offset:	N/A
		Depth (ft):	13.5' - 15.0'
Sample Description:	Gray Silty SAND (SM)		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
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

Maximum Particle Size	#4	Coarse Sand	0.5%	Fine Sand	35.3%
Gravel	0.0%	Medium Sand	50.1%	Silt & Clay	14.1%
Liquid Limit	ND	Plastic Limit	ND	Plastic Index	ND
Specific Gravity	ND			Moisture Content	29.3%

Coarse Sand	0.5%	Medium Sand	50.1%	Fine Sand	35.3%

Description of Sand & Gravel Particles:		Rounded	☐	Angular	☒
Hard & Durable	☒	Soft	☐	Weathered & Friable	☐

Notes / Deviations / References: ND=Not Determined.

Mal Krajan, ET

Technical Responsibility

Laboratory Manager

Position

Date

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Sieve Analysis of Soils

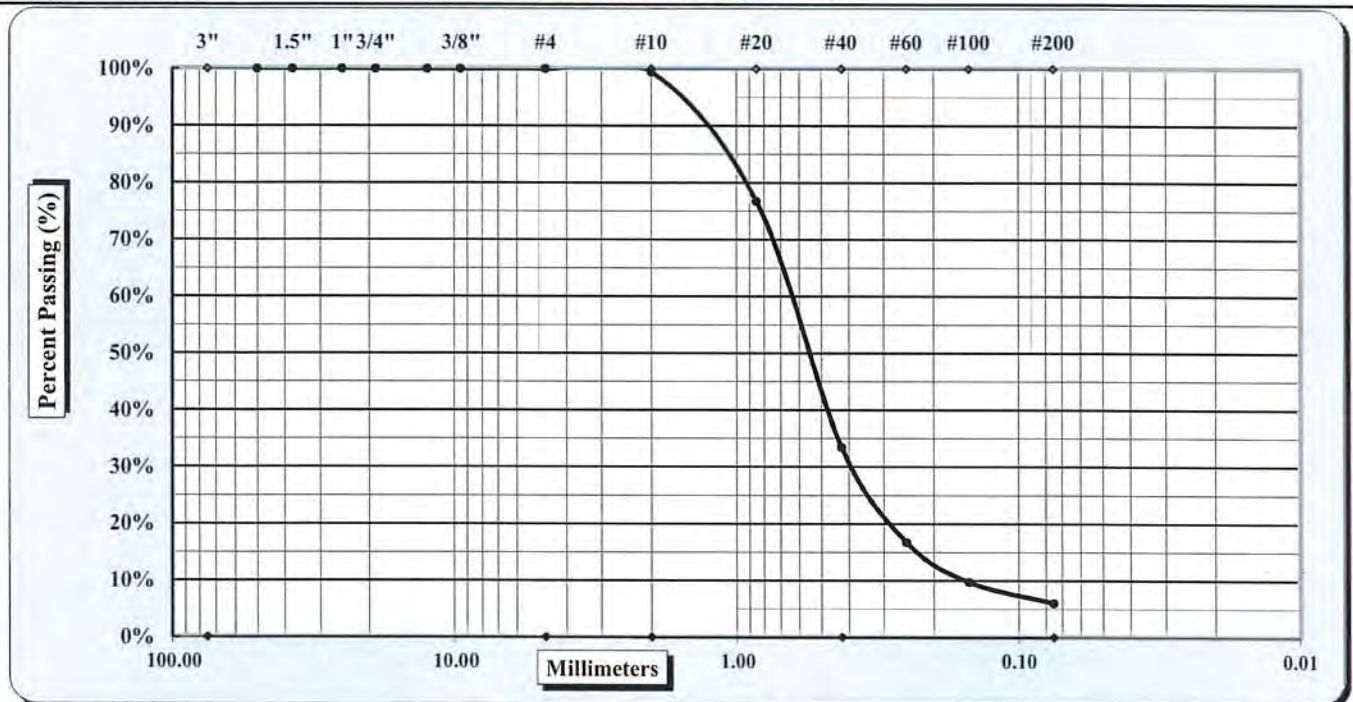


ASTM D 6913

Quality Assurance

S&ME, Inc. Raleigh, 3201 Spring Forest Road, Raleigh, North Carolina 27616

Project #:	1358-14-033	Report Date:	07/17/2014
Project Name:	US 264 HDD Crossings	Test Date(s):	07/14 - 07/16/2014
Client Name:	RK&K		
Client Address:	2100 East Cary Street, Suite 209, Richmond, VA 23223		
Boring No.:	B-6	Sample #:	S-7
		Sample Date:	07/08/2014
Location:	Site-Borehole	Offset:	N/A
		Depth (ft):	23.5' - 25.0'
Sample Description:	Gray Poorly Graded SAND with Silt (SP-SM)		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
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

Maximum Particle Size	#4	Coarse Sand	0.6%	Fine Sand	27.4%
Gravel	0.0%	Medium Sand	66.0%	Silt & Clay	6.0%
Liquid Limit	ND	Plastic Limit	ND	Plastic Index	ND
Specific Gravity	ND			Moisture Content	18.4%

Coarse Sand	0.6%	Medium Sand	66.0%	Fine Sand	27.4%

Description of Sand & Gravel Particles:		Rounded	☐	Angular	☒
Hard & Durable	☒	Soft	☐	Weathered & Friable	☐

Notes / Deviations / References: ND=Not Determined.

Mal Krajan, ET
Technical Responsibility

Signature

Laboratory Manager
Position

Date

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Liquid Limit, Plastic Limit, and Plastic Index


 Test Methods: ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐ Quality Assurance

S&ME, Inc. Raleigh, 3201 Spring Forest Road, Raleigh, North Carolina 27616

Project #: 1358-14-033 Report Date: 7/19/14

Project Name: US 264 HDD Crossings Test Date(s): 7/14 - 7/17/14

Client Name: RK&K

Client Address: 2100 East Cary Street, Suite 209, Richmond, VA 23223

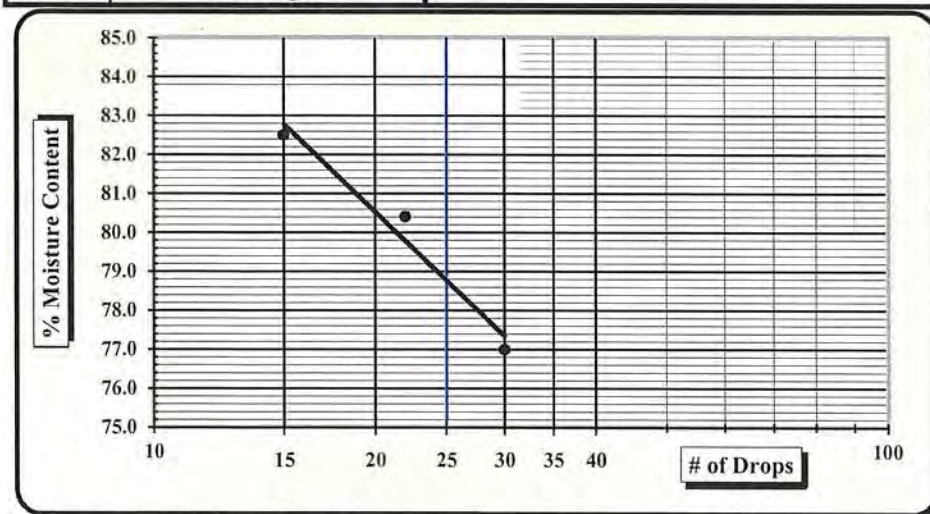
Boring #: B-6 Sample #: S-8 Sample Date: 07/08/2014

Location: Site Borehole Offset: N/A Depth (ft): 18.5 - 20 ft.

Sample Description: Gray Olive Sandy Fat CLAY (CH)

Type and Specification	S&ME ID #	Cal Date:	Type and Specification	S&ME ID #	Cal Date:
Balance (0.01 g)	1024	11/4/2013	Grooving tool	S-1	5/20/2014
LL Apparatus	13288	8/10/2013			
Oven	1454	10/1/2013			

Pan #	Tare #:	Liquid Limit					Plastic Limit	
		17	23	7			29	27
A	Tare Weight	12.88	13.06	12.92			13.07	13.01
B	Wet Soil Weight + A	23.41	25.76	22.90			20.32	22.88
C	Dry Soil Weight + A	18.65	20.10	18.56			18.44	20.32
D	Water Weight (B-C)	4.76	5.66	4.34			1.88	2.56
E	Dry Soil Weight (C-A)	5.77	7.04	5.64			5.37	7.31
F	% Moisture (D/E)*100	82.5%	80.4%	77.0%			35.0%	35.0%
N	# OF DROPS	15	22	30			Moisture Contents determined by ASTM D 2216	
LL	LL = F * FACTOR							
Ave.	Average						35.0%	



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 79

Plastic Limit 35

Plastic Index 44

Group Symbol CH

Multipoint Method ☒One-point Method ☐Wet Preparation ☒ Dry Preparation ☐ Air Dried ☐ Estimate the % Retained on the #40 Sieve: 0%

Notes / Deviations / References:

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Mal Krajan, ET

Technical Responsibility

Signature

Laboratory Manager

Position

Date

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Liquid Limit, Plastic Limit, and Plastic Index


 Test Methods: ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐ Quality Assurance

S&ME, Inc. Raleigh, 3201 Spring Forest Road, Raleigh, North Carolina 27616

Project #: 1358-14-033 Report Date: 7/19/14

Project Name: US 264 HDD Crossings Test Date(s) 7/14 - 7/17/14

Client Name: RK&K

Client Address: 2100 East Cary Street, Suite 209, Richmond, VA 23223

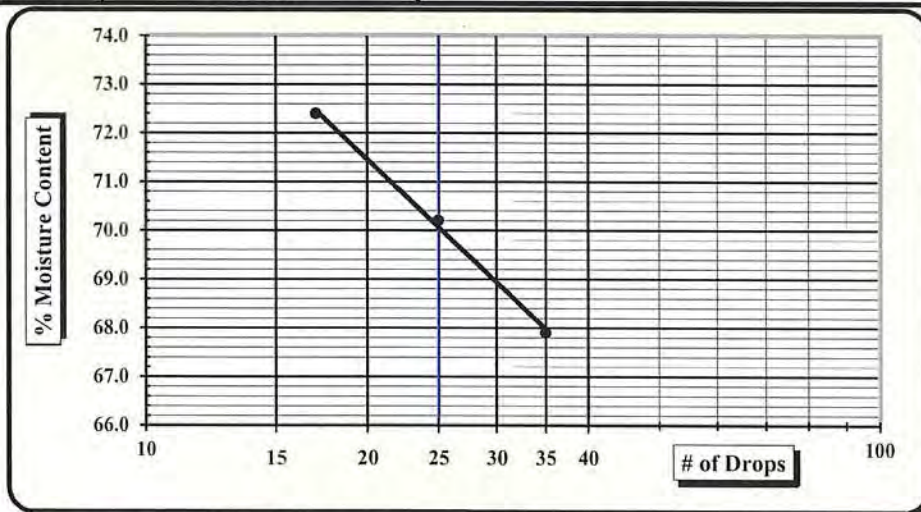
Boring #: B-6 Sample #: S-10 Sample Date: 07/08/2014

Location: Site Borehole Offset: N/A Depth (ft): 38.5 - 40 ft.

Sample Description: Gray Olive Sandy Fat CLAY (CH)

Type and Specification	S&ME ID #	Cal Date:	Type and Specification	S&ME ID #	Cal Date:
Balance (0.01 g)	1024	11/4/2013	Grooving tool	S-1	5/20/2014
LL Apparatus	13288	8/10/2013			
Oven	1454	10/1/2013			

Pan #	Tare #:	Liquid Limit					Plastic Limit		
		810	3	5			24	4	
A	Tare Weight	16.63	15.30	10.99			13.06	13.04	
B	Wet Soil Weight + A	31.01	27.83	23.50			21.84	21.66	
C	Dry Soil Weight + A	24.97	22.66	18.44			19.87	19.73	
D	Water Weight (B-C)	6.04	5.17	5.06			1.97	1.93	
E	Dry Soil Weight (C-A)	8.34	7.36	7.45			6.81	6.69	
F	% Moisture (D/E)*100	72.4%	70.2%	67.9%			28.9%	28.8%	
N	# OF DROPS	17	25	35			Moisture Contents determined by ASTM D 2216		
LL	LL = F * FACTOR								
Ave.	Average						28.9%		



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 70

Plastic Limit 29

Plastic Index 41

Group Symbol CH

Multipoint Method ☒One-point Method ☐Wet Preparation ☒ Dry Preparation ☐ Air Dried ☐ Estimate the % Retained on the #40 Sieve: 0%

Notes / Deviations / References:

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Mal Krajan, ET

Technical Responsibility

Laboratory Manager

Position

Date

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Sieve Analysis of Soils



ASTM D 6913

Quality Assurance

S&ME, Inc. Raleigh, 3201 Spring Forest Road, Raleigh, North Carolina 27616

Project #: 1358-14-033

Report Date: 07/19/2014

Project Name: US 264 HDD Crossings

Test Date(s): 07/14 - 07/16/2014

Client Name: RK&K

Client Address: 2100 East Cary Street, Suite 209, Richmond, VA 23223

Boring No.: B-6

Sample: S-11

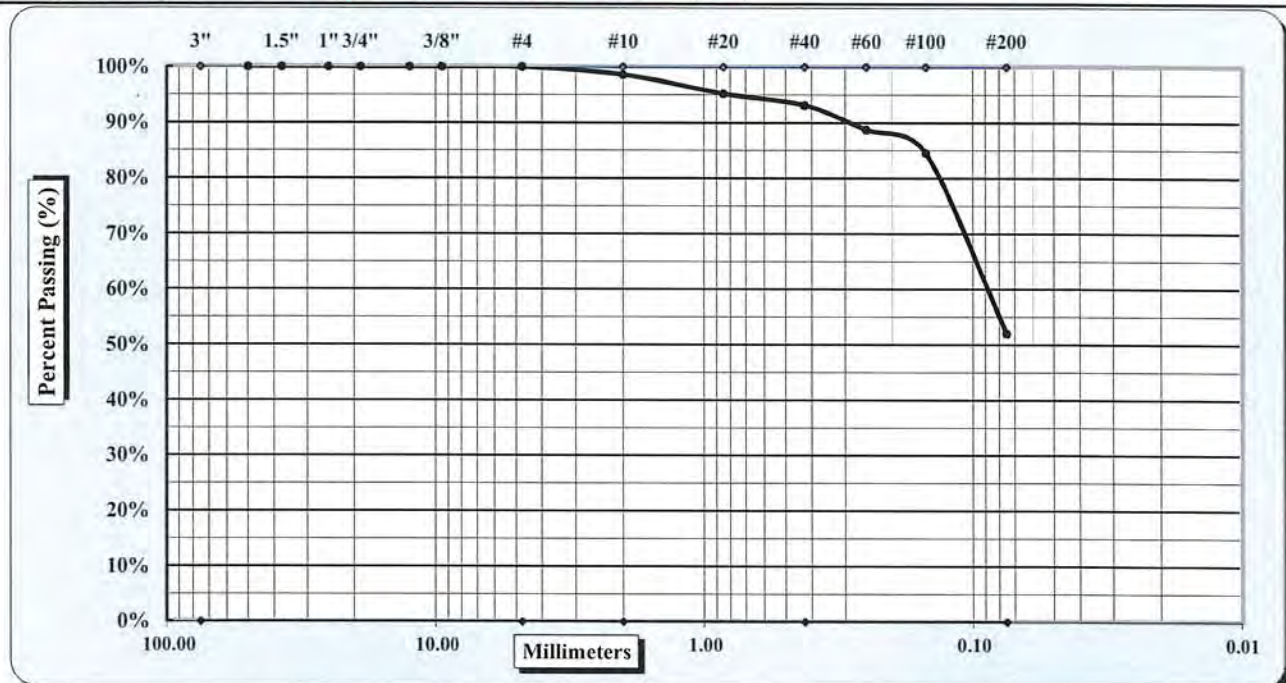
Sample Date: 07/08/2014

Location: Site-Borehole

Offset: N/A

Depth (ft): 43.5' - 45.0'

Sample Description: Gray Black Elastic SILT with Sand (MH)



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
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

Maximum Particle Size	#4	Coarse Sand	1.4%	Fine Sand	41.1%
Gravel	0.0%	Medium Sand	5.5%	Silt & Clay	52.0%
Liquid Limit	64	Plastic Limit	39	Plastic Index	25
Specific Gravity	ND			Moisture Content	59.5%
Coarse Sand	1.4%	Medium Sand	5.5%	Fine Sand	41.1%
Description of Sand & Gravel Particles:					
Rounded		☐	Angular		☐
Hard & Durable		☐	Weathered & Friable		☐
Soft		☐			

Notes / Deviations / References:

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

ASTM D 2487: Classification of Soils for Engineering Purposes (Unified Soil Classification System)

Mal Krajan, ET

Technical Responsibility

Laboratory Manager

Position

Date

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Liquid Limit, Plastic Limit, and Plastic Index



S&ME, Inc. Raleigh, 3201 Spring Forest Road, Raleigh, North Carolina 27616

Project #: 1358-14-033

Report Date: 07/19/2014

Project Name: US 264 HDD Crossings

Test Date(s) 07/14 - 07/16/2014

Client Name: RK&K

Client Address: 2100 East Cary Street, Suite 209, Richmond, VA 23223

Boring #: B-6

Sample #: S-11

Sample Date: 07/08/2014

Location: Site-Borehole

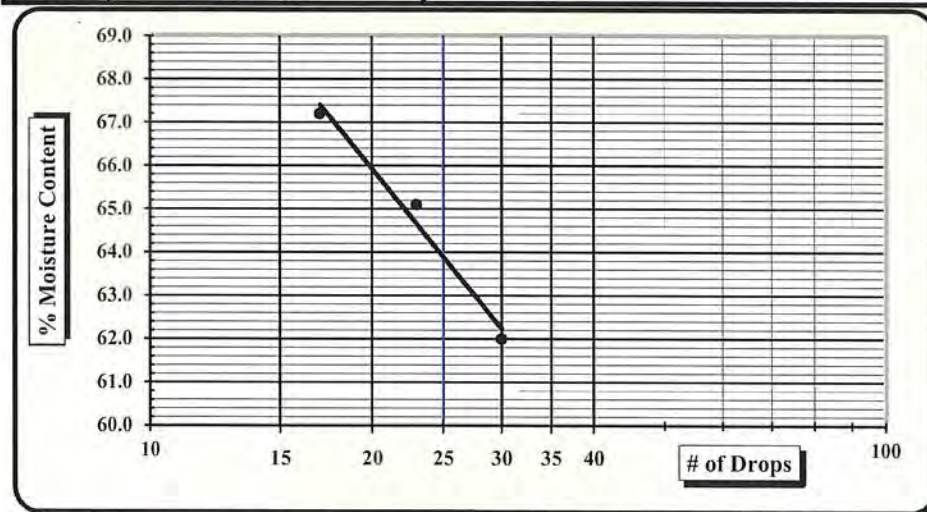
Offset: N/A

Depth (ft): 43.5' - 45.0'

Sample Description: Gray Black Elastic SILT with Sand (MH)

Type and Specification	S&ME ID #	Cal Date:	Type and Specification	S&ME ID #	Cal Date:
Balance (0.01 g)	1024	11/14/2013	Grooving tool	S-1	5/20/2014
LL Apparatus	1084	8/17/2013			
Oven	1454	10/1/2013			

Pan #	Tare #:	Liquid Limit					Plastic Limit	
		18	803	16			20	28
A	Tare Weight	12.97	16.70	13.01			12.95	12.98
B	Wet Soil Weight + A	25.36	29.08	24.90			22.27	21.06
C	Dry Soil Weight + A	20.38	24.20	20.35			19.62	18.84
D	Water Weight (B-C)	4.98	4.88	4.55			2.65	2.22
E	Dry Soil Weight (C-A)	7.41	7.50	7.34			6.67	5.86
F	% Moisture (D/E)*100	67.2%	65.1%	62.0%			39.7%	37.9%
N	# OF DROPS	17	23	30			Moisture Contents determined by ASTM D 2216	
LL	LL = F * FACTOR							
Ave.	Average						38.8%	



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 64

Plastic Limit 39

Plastic Index 25

Group Symbol MH

Multipoint Method ☒One-point Method ☐Wet Preparation ☒Dry Preparation ☐Air Dried ☐

Estimate the % Retained on the #40 Sieve:

Notes / Deviations / References:

ASTM D 2487: Classification of Soils for Engineering Purposes (Unified Soil Classification System)

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Mal Krajan, ET

Technical Responsibility

Signature

Laboratory Manager

Position

Date

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Sieve Analysis of Soils



ASTM D 6913

Quality Assurance

S&ME, Inc. Raleigh, 3201 Spring Forest Road, Raleigh, North Carolina 27616

Project #: 1358-14-033

Report Date: 07/17/2014

Project Name: US 264 HDD Crossings

Test Date(s): 07/14 - 07/16/2014

Client Name: RK&K

Client Address: 2100 East Cary Street, Suite 209, Richmond, VA 23223

Boring No.: B-7

Sample #: S-4

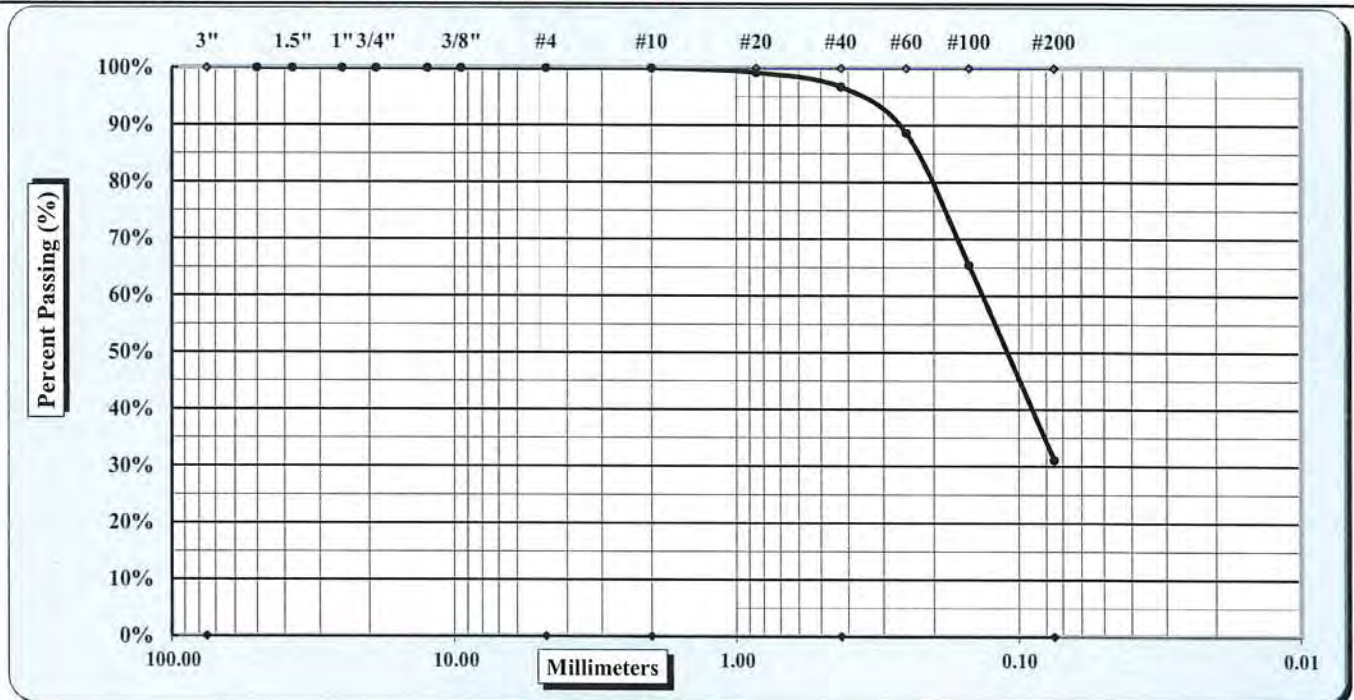
Sample Date: 07/08/2014

Location: Site-Borehole

Offset: N/A

Depth (ft): 8.5' - 10.0'

Sample Description: Orange Tan Clayey SAND (SC)



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 mm 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

Maximum Particle Size	#4	Coarse Sand	0.0%	Fine Sand	65.6%

Gravel	0.0%	Medium Sand	3.3%	Silt & Clay	31.1%

Liquid Limit	ND	Plastic Limit	ND	Plastic Index	ND

Specific Gravity	ND	Moisture Content	17.9%

Coarse Sand	0.0%	Medium Sand	3.3%	Fine Sand	65.6%

Description of Sand & Gravel Particles:	Rounded	☐	Angular	☒

Hard & Durable	☒	Soft	☐	Weathered & Friable	☐

Notes / Deviations / References: ND=Not Determined.

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Technical Responsibility

Laboratory Manager

Position

Date

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Sieve Analysis of Soils

ASTM D 6913

Quality Assurance

S&ME, Inc. Raleigh, 3201 Spring Forest Road, Raleigh, North Carolina 27616

Project #: 1358-14-033

Report Date: 07/17/2014

Project Name: US 264 HDD Crossings

Test Date(s): 07/14 - 07/16/2014

Client Name: RK&K

Client Address: 2100 East Cary Street, Suite 209, Richmond, VA 23223

Boring No.: B-7

Sample #:

S-6

Sample Date:

07/08/2014

Location: Site-Borehole

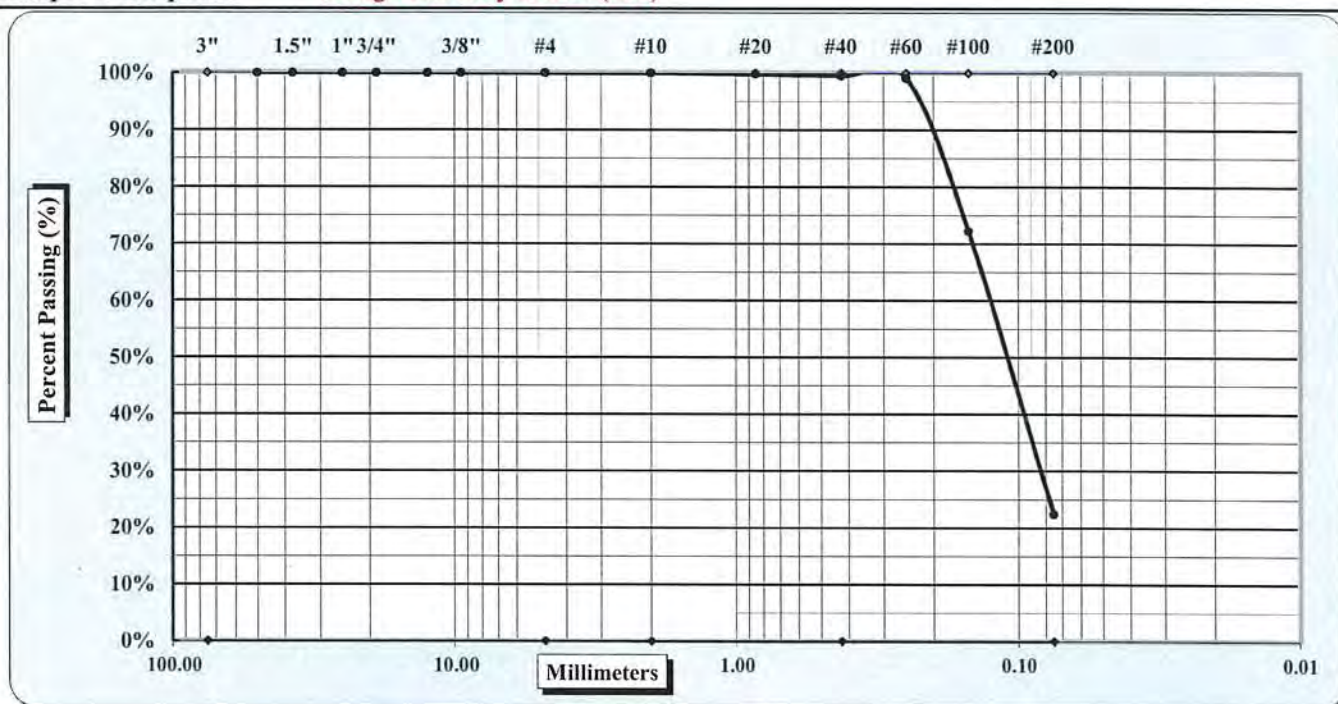
Offset:

N/A

Depth (ft):

18.5' - 20.0'

Sample Description: Orange Tan Silty SAND (SM)



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
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

Maximum Particle Size	#4	Coarse Sand	0.0%	Fine Sand	77.1%

Gravel	0.0%	Medium Sand	0.5%	Silt & Clay	22.4%

Liquid Limit	ND	Plastic Limit	ND	Plastic Index	ND

Specific Gravity	ND	Moisture Content	36.5%

Coarse Sand	0.0%	Medium Sand	0.5%	Fine Sand	77.1%

Description of Sand & Gravel Particles: Rounded ☐ Angular ☒

Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

Notes / Deviations / References: ND=Not Determined.

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Technical Responsibility

Laboratory Manager

Position

Date _____

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Sieve Analysis of Soils



ASTM D 6913

Quality Assurance

S&ME, Inc. Raleigh, 3201 Spring Forest Road, Raleigh, North Carolina 27616

Project #: 1358-14-033

Report Date: 07/17/2014

Project Name: US 264 HDD Crossings

Test Date(s): 07/14 - 07/16/2014

Client Name: RK&K

Client Address: 2100 East Cary Street, Suite 209, Richmond, VA 23223

Boring No.: B-7

Sample #: S-8

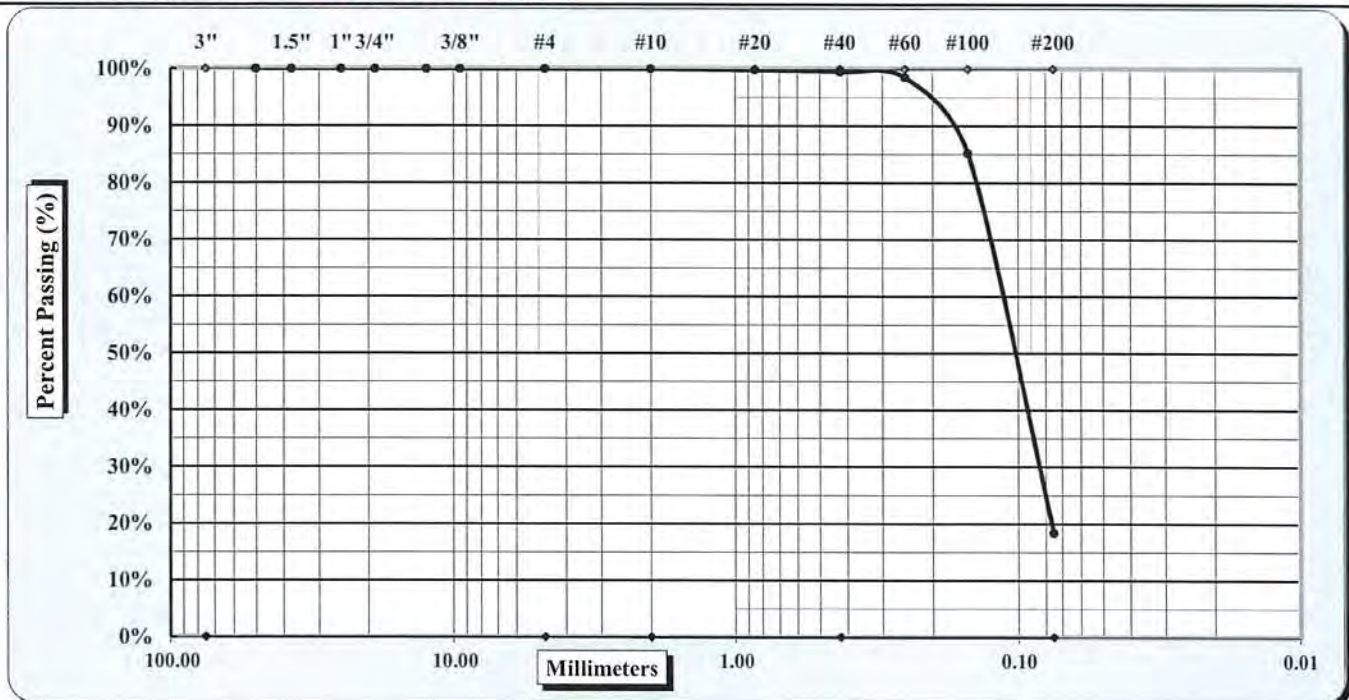
Sample Date: 07/08/2014

Location: Site-Borehole

Offset: N/A

Depth (ft): 28.5' - 30.0'

Sample Description: Gray Silty SAND (SM)



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
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

Maximum Particle Size	#4	Coarse Sand	0.0%	Fine Sand	81.1%

Gravel	0.0%	Medium Sand	0.5%	Silt & Clay	18.4%

Liquid Limit	ND	Plastic Limit	ND	Plastic Index	ND

Specific Gravity	ND	Moisture Content	33.4%

Coarse Sand	0.0%	Medium Sand	0.5%	Fine Sand	81.1%

Description of Sand & Gravel Particles:	Rounded	☐	Angular	☒

Hard & Durable	☒	Soft	☐	Weathered & Friable	☐

Notes / Deviations / References: ND=Not Determined.

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Technical Responsibility

Laboratory Manager

Position

Date

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Sieve Analysis of Soils

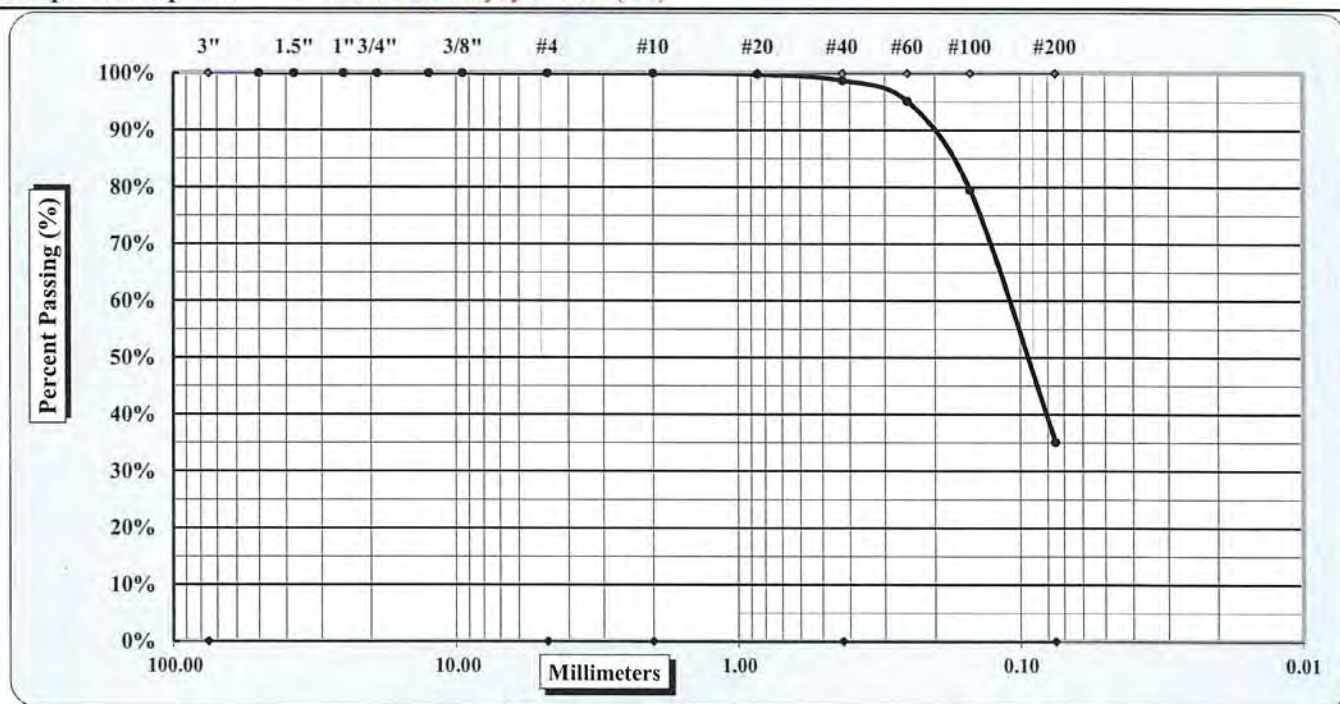


ASTM D 6913

Quality Assurance

S&ME, Inc. Raleigh, 3201 Spring Forest Road, Raleigh, North Carolina 27616

Project #:	1358-14-033	Report Date:	07/17/2014
Project Name:	US 264 HDD Crossings	Test Date(s):	07/14 - 07/16/2014
Client Name:	RK&K		
Client Address:	2100 East Cary Street, Suite 209, Richmond, VA 23223		
Boring No.:	B-8	Sample #:	S-4
		Sample Date:	07/08/2014
Location:	Site-Borehole	Offset:	N/A
		Depth (ft):	8.5' - 10.0'
Sample Description:	White Tan Clayey SAND (SC)		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
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

Maximum Particle Size	#10	Coarse Sand	0.0%	Fine Sand	63.6%

Gravel	0.0%	Medium Sand	1.3%	Silt & Clay	35.1%

Liquid Limit	ND	Plastic Limit	ND	Plastic Index	ND

Specific Gravity	ND	Moisture Content	32.9%

Coarse Sand	0.0%	Medium Sand	1.3%	Fine Sand	63.6%

Description of Sand & Gravel Particles:	Rounded	☐	Angular	☒

Hard & Durable	☒	Soft	☐	Weathered & Friable	☐

Notes / Deviations / References: ND=Not Determined.

Mal Krajan, ET

Technical Responsibility

Laboratory Manager

Position

Date

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Sieve Analysis of Soils

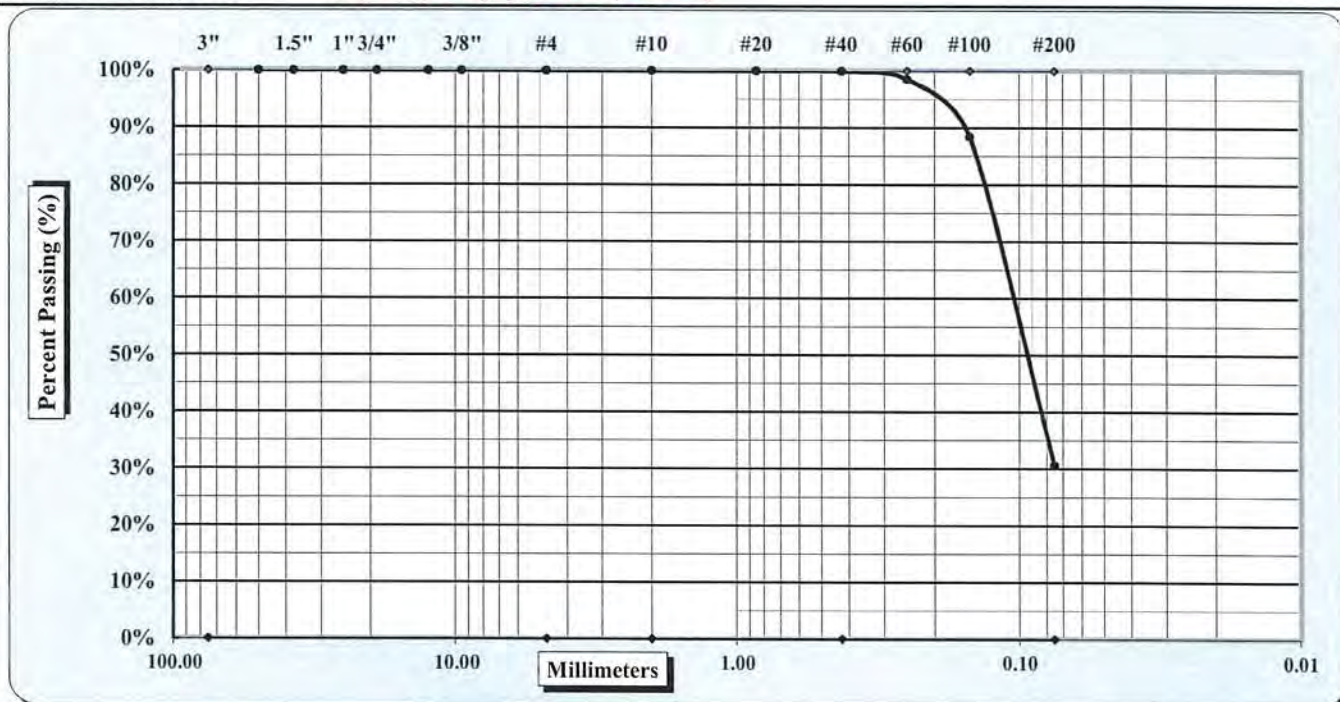


ASTM D 6913

Quality Assurance

S&ME, Inc. Raleigh, 3201 Spring Forest Road, Raleigh, North Carolina 27616

Project #:	1358-14-033	Report Date:	07/17/2014
Project Name:	US 264 HDD Crossings	Test Date(s):	07/14 - 07/16/2014
Client Name:	RK&K		
Client Address:	2100 East Cary Street, Suite 209, Richmond, VA 23223		
Boring No.:	B-8	Sample #:	S-7
		Sample Date:	07/08/2014
Location:	Site-Borehole	Offset:	N/A
		Depth (ft):	23.5' - 25.0'
Sample Description:	Gray Silty Clayey SAND (SC-SM)		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
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

Maximum Particle Size	#10	Coarse Sand	0.0%	Fine Sand	69.3%
Gravel	0.0%	Medium Sand	0.1%	Silt & Clay	30.6%
Liquid Limit	ND	Plastic Limit	ND	Plastic Index	ND
Specific Gravity	ND			Moisture Content	37.5%

Coarse Sand	0.0%	Medium Sand	0.1%	Fine Sand	69.3%

Description of Sand & Gravel Particles:		Rounded	☐	Angular	☒
Hard & Durable	☒	Soft	☐	Weathered & Friable	☐

Notes / Deviations / References: ND=Not Determined.

Mal Krajan, ET

Technical Responsibility

Laboratory Manager

Position

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Sieve Analysis of Soils



ASTM D 6913

Quality Assurance

S&ME, Inc. Raleigh, 3201 Spring Forest Road, Raleigh, North Carolina 27616

Project #: 1358-14-033

Report Date: 07/17/2014

Project Name: US 264 HDD Crossings

Test Date(s): 07/14 - 07/16/2014

Client Name: RK&K

Client Address: 2100 East Cary Street, Suite 209, Richmond, VA 23223

Boring No.: B-8

Sample #: S-9

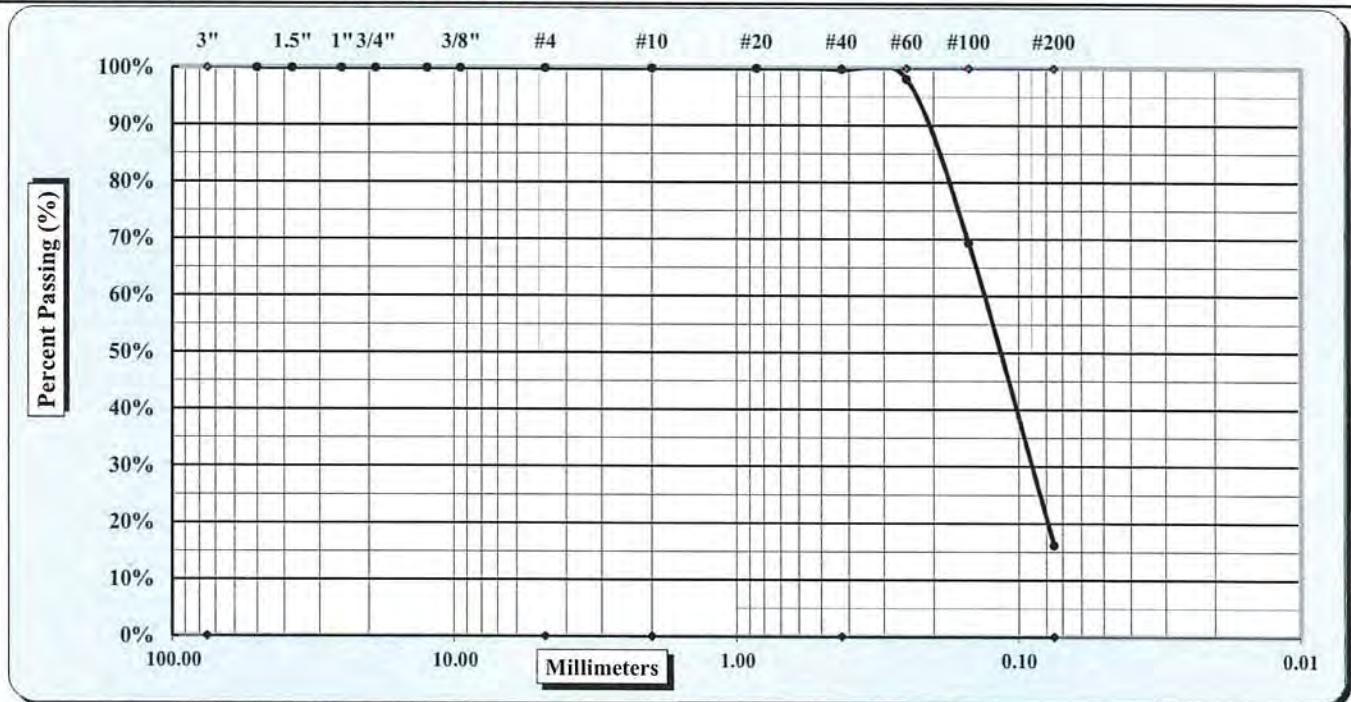
Sample Date: 07/08/2014

Location: Site-Borehole

Offset: N/A

Depth (ft): 33.5' - 35.0

Sample Description: Gray Silty Clayey SAND (SC-SM)



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
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

Maximum Particle Size	#10	Coarse Sand	0.0%	Fine Sand	83.7%
Gravel	0.0%	Medium Sand	0.2%	Silt & Clay	16.1%
Liquid Limit	ND	Plastic Limit	ND	Plastic Index	ND
Specific Gravity	ND			Moisture Content	32.1%
Coarse Sand	0.0%	Medium Sand	0.2%	Fine Sand	83.7%

Description of Sand & Gravel Particles: Rounded ☐ Angular ☒
 Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

Notes / Deviations / References: ND=Not Determined.

Mal Krajan, ET

Technical Responsibility

Laboratory Manager

Position

Date

Signature

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