STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
HIGHWAY DIVISION 4

PROPOSAL

DATE AND TIME OF BID OPENING: JANUARY 8, 2019 AT 2:00 PM

CONTRACT ID: DD00288

WBS ELEMENT NO.: 15RE.33

FEDERAL AID NO.: STATE FUNDED

COUNTY: NASH COUNTY

TIP NO.: N/A

MILES: 0.75 MILES

ROUTE NO.: I-95

LOCATION: NASH COUNTY REST AREA

TYPE OF WORK: WATER LINE

NOTICE:

ALL BIDDERS SHALL COMPLY WITH ALL APPLICABLE LAWS REGULATING THE PRACTICE OF GENERAL CONTRACTING AS CONTAINED IN CHAPTER 87 OF THE GENERAL STATUTES OF NORTH CAROLINA WHICH REQUIRES THE BIDDER TO BE LICENSED BY THE N.C. LICENSING BOARD FOR CONTRACTORS WHEN BIDDING ON ANY NON-FEDERAL AID PROJECT WHERE THE BID IS $30,000 OR MORE, EXCEPT FOR CERTAIN SPECIALTY WORK AS DETERMINED BY THE LICENSING BOARD. BIDDERS SHALL ALSO COMPLY WITH ALL OTHER APPLICABLE LAWS REGULATING THE PRACTICES OF ELECTRICAL, PLUMBING, HEATING AND AIR CONDITIONING AND REFRIGERATION CONTRACTING AS CONTAINED IN CHAPTER 87 OF THE GENERAL STATUTES OF NORTH CAROLINA. NOTWITHSTANDING THESE LIMITATIONS ON BIDDING, THE BIDDER WHO IS AWARDED ANY FEDERAL - AID FUNDED PROJECT SHALL COMPLY WITH CHAPTER 87 OF THE GENERAL STATUTES OF NORTH CAROLINA FOR LICENSING REQUIREMENTS WITHIN 60 CALENDAR DAYS OF BID OPENING.

THIS IS A ROADWAY PROJECT. **BID BONDS ARE NOT REQUIRED.**

_____

NAME OF BIDDER

_____

ADDRESS OF BIDDER

PROPOSAL FOR THE CONSTRUCTION OF

CONTRACT No. DD00288 IN NASH COUNTY, NORTH CAROLINA

JANUARY 8, 2019

DEPARTMENT OF TRANSPORTATION,

WILSON, NORTH CAROLINA

The Bidder has carefully examined the location of the proposed work to be known as Contract No. **DD00288**; has carefully examined the plans and specifications, which are acknowledged to be part of the proposal, the special provisions, the proposal, the form of contract; and thoroughly understands the stipulations, requirements and provisions. The undersigned bidder agrees to bound upon his execution of the bid and subsequent award to him by the Department of Transportation in accordance with this proposal to provide all necessary machinery, tools, labor, and other means of construction; and to do all the work and to furnish all materials, except as otherwise noted, necessary to perform and complete the said contract in accordance with *the 2018 Standard Specifications for Roads and Structures* by the dates(s) specified in the Project Special Provisions and in accordance with the requirements of the Engineer, and at the unit or lump sum prices, as the case may be, for the various items given on the sheets contained herein.

The Bidder shall provide and furnish all the materials, machinery, implements, appliances and tools, and perform the work and required labor to construct and complete State Highway Contract No. **DD00288** in **NASH COUNTY**, for the unit or lump sum prices, as the case may be, bid by the Bidder in his bid and according to the proposal, plans, and specifications prepared by said Department, which proposal, plans, and specifications show the details covering this project, and hereby become a part of this contract.

The published volume entitled *North Carolina Department of Transportation, Raleigh, Standard Specifications for Roads and Structures, January 2018* with all amendments and supplements thereto, is by reference incorporated into and made a part of this contract; that, except as herein modified, all the construction and work included in this contract is to be done in accordance with the specifications contained in said volume, and amendments and supplements thereto, under the direction of the Engineer.

If the proposal is accepted and the award is made, the contract is valid only when signed either by the Contract Officer or such other person as may be designated by the Secretary to sign for the Department of Transportation. The conditions and provisions herein cannot be changed except over the signature of the said Contract Officer or Division Engineer.

The quantities shown in the itemized proposal for the project are considered to be approximate only and are given as the basis for comparison of bids. The Department of Transportation may increase or decrease the quantity of any item or portion of the work as may be deemed necessary or expedient.

An increase or decrease in the quantity of an item will not be regarded as sufficient ground for an increase or decrease in the unit prices, nor in the time allowed for the completion of the work, except as provided for the contract.

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THIS CONTRACT IS FOR CONTRACT ID **DD00288** FOR **WATER LINE** WORK IN **NASH COUNTY**.

INSTRUCTIONS TO BIDDERS

PLEASE READ ALL INSTRUCTIONS CAREFULLY
BEFORE PREPARING AND SUBMITTING YOUR BID.

All bids shall be prepared and submitted in accordance with the following requirements. Failure to comply with any requirement may cause the bid to be considered irregular and may be grounds for rejection of the bid.

For preparing and submitting the bid electronically using the on-line system Bid Express®, refer to Article 102-8(B) of the *2018 Standard Specifications.*

Bidders that bid electronically on Raleigh Central-Let projects will need a separate Digital Signature form Bid Express® for Division Contracts.

ELECTRONIC ON-LINE BID THRU BID EXPRESS:

1. Download entire proposal from Connect NCDOT website. Download EBS file from Bid Express website.
2. Prepare and submit EBS file using Expedite software.
3. Expedite software necessary for electronic bid preparation may be downloaded from the Connect NCDOT website at: https://connect.ncdot.gov/letting/Pages/EBS-Information.aspx or from Bid Express.

PROJECT SPECIAL PROVISIONS

GENERAL

REQUIRED PRECONSTRUCTION MEETING:

The Contractor shall attend the required pre-construction meeting on Wednesday, January 16, 2019 at 10:00 A.M. in the Division Four Conference Room located in Wilson, NC.

The proposed progress schedule must be submitted to the Division Construction Engineer seven (**7**) days prior to the date of the preconstruction meeting. At the preconstruction meeting the Contractor shall supply the following information:

- Name of persons authorized to sign Supplemental Agreements
- Name of the EEO Officer and Minority Liaison Officer
- Name of the Erosion Control and Sediment Control/Storm Water Certified Supervisor, Certified Foreman, Certified Installer, and Certified Designer
- Name of the Work Zone Traffic Control Supervisor
- Buy America Certification

BOND REQUIREMENTS – No Bonds Required

(06-01-16) SPD 01-420B

The provisions of Articles 102-10 and 103-7 of the *2018 Standard Specifications for Roads and Structures* are waived for this project. No bonds required.

CONTRACT TIME AND LIQUIDATED DAMAGES:

(4-17-12) 108 SP1 G07 C

The date of availability for this contract is **January 22, 2019**.

The completion date for this contract is **May 31, 2019.**

Except where otherwise provided by the contract, observation periods required by the contract will not be a part of the work to be completed by the completion date and/or intermediate contract times stated in the contract. The acceptable completion of the observation periods that extend beyond the final completion date shall be a part of the work covered by the performance and payment bonds.

The liquidated damages for this contract are **Two Hundred Dollars ($200.00)** per calendar day. These liquidated damages will not be cumulative with any liquidated damages which may become chargeable under Intermediate Contract Time Number 1.

INTERMEDIATE CONTRACT TIME NUMBER 1 AND LIQUIDATED DAMAGES:

(7-1-95) (Rev. 2-21-12) 108 SP1 G13 A

Except for that work required under the Project Special Provisions entitled *Planting, Reforestation* and/or *Permanent Vegetation Establishment*, included elsewhere in this proposal, the Contractor will be required to complete all work included in this contract and shall place and maintain traffic on same.

The date of availability for this intermediate contract time is **January 22, 2019**.

The completion date for this intermediate contract time is **March 22, 2019**.

The liquidated damages for this intermediate contract time are **One Thousand Dollars ($1,000.00)** per calendar day.

Upon apparent completion of all the work required to be completed by this intermediate date, a final inspection will be held in accordance with Article 105-17 and upon acceptance, the Department will assume responsibility for the maintenance of all work except *Planting, Reforestation* and/or *Permanent Vegetation Establishment*. The Contractor will be responsible for and shall make corrections of all damages to the completed roadway caused by his planting operations, whether occurring prior to or after placing traffic through the project.

PERMANENT VEGETATION ESTABLISHMENT:

(2-16-12) (Rev. 10-15-13) 104 SP1 G16

Establish a permanent stand of the vegetation mixture shown in the contract. During the period between initial vegetation planting and final project acceptance, perform all work necessary to establish permanent vegetation on all erodible areas within the project limits, as well as, in borrow and waste pits. This work shall include erosion control device maintenance and installation, repair seeding and mulching, supplemental seeding and mulching, mowing, and fertilizer topdressing, as directed. All work shall be performed in accordance with the applicable section of the *2018 Standard Specifications*. All work required for initial vegetation planting shall be performed as a part of the work necessary for the completion and acceptance of the Intermediate Contract Time (ICT). Between the time of ICT and Final Project acceptance, or otherwise referred to as the vegetation establishment period, the Department will be responsible for preparing the required National Pollutant Discharge Elimination System (NPDES) inspection records.

Once the Engineer has determined that the permanent vegetation establishment requirement has been achieved at an 80% vegetation density (the amount of established vegetation per given area to stabilize the soil) and no erodible areas exist within the project limits, the Contractor will be notified to remove the remaining erosion control devices that are no longer needed. The Contractor will be responsible for, and shall correct any areas disturbed by operations performed in permanent vegetation establishment and the removal of temporary erosion control measures, whether occurring prior to or after placing traffic on the project.

Payment for *Response for Erosion Control*, *Seeding and Mulching, Repair Seeding, Supplemental Seeding, Mowing, Fertilizer Topdressing, Silt Excavation,* and *Stone for Erosion Control* will be made at contract unit prices for the affected items. Work required that is not represented by contract line items will be paid in accordance with Articles 104-7 or 104-3 of the *2018 Standard Specifications*. No additional compensation will be made for maintenance and removal of temporary erosion control items.

NO MAJOR CONTRACT ITEMS:

(2-19-02) (Rev. 8-21-07) 104 SP1 G31

None of the items included in this contract will be major items.

SPECIALTY ITEMS:

(7-1-95)(Rev. 1-17-12) 108-6 SP1 G37

Items listed below will be the specialty items for this contract (see Article 108-6 of the *2018 Standard Specifications*).

Line #	Description
17 - 28	Erosion Control

MINORITY BUSINESS ENTERPRISE AND WOMEN BUSINESS ENTERPRISE (DIVISIONS):

(10-16-07)(Rev. 1-15-19) 102-15(J) SP1 G67

Description

The purpose of this Special Provision is to carry out the North Carolina Department of Transportation's policy of ensuring nondiscrimination in the award and administration of contracts financed in whole or in part with State funds.

Definitions

Additional MBE/WBE Subcontractors - Any MBE/WBE submitted at the time of bid that will not be used to meet the Combined MBE/WBE goal. No submittal of a Letter of Intent is required.

Combined MBE/WBE Goal: A portion of the total contract, expressed as a percentage that is to be performed by committed MBE/WBE subcontractors.

Committed MBE/WBE Subcontractor - Any MBE/WBE submitted at the time of bid that is being used to meet the Combined MBE / WBE goal by submission of a Letter of Intent. Or any MBE or WBE used as a replacement for a previously committed MBE or WBE firm.

Contract Goal Requirement - The approved participation at time of award, but not greater than the advertised Combined MBE/WBE contract goal.

Goal Confirmation Letter - Written documentation from the Department to the bidder confirming the Contractor's approved, committed participation along with a listing of the committed MBE and WBE firms.

Manufacturer - A firm that operates or maintains a factory or establishment that produces on the premises, the materials or supplies obtained by the Contractor.

MBE Participation (Anticipated) - A portion of the total contract, expressed as a percentage that is anticipated to be performed by committed MBE subcontractor(s).

Minority Business Enterprise (MBE) - A firm certified as a Disadvantaged Minority-Owned Business Enterprise through the North Carolina Unified Certification Program.

Regular Dealer - A firm that owns, operates, or maintains a store, warehouse, or other establishment in which the materials or supplies required for the performance of the contract are bought, kept in stock, and regularly sold to the public in the usual course of business. A regular dealer engages in, as its principal business and in its own name, the purchase and sale or lease of

the products in question. A regular dealer in such bulk items as steel, cement, gravel, stone, and petroleum products need not keep such products in stock, if it owns and operates distribution equipment for the products. Brokers and packagers are not regarded as manufacturers or regular dealers within the meaning of this section.

Replacement / Substitution – A full or partial reduction in the amount of work subcontracted to a committed (or an approved substitute) MBE/WBE firm.

North Carolina Unified Certification Program (NCUCP) - A program that provides comprehensive services and information to applicants for MBE/WBE certification. The MBE/WBE program follows the same regulations as the federal Disadvantaged Business Enterprise (DBE) program in accordance with 49 CFR Part 26.

United States Department of Transportation (USDOT) - Federal agency responsible for issuing regulations (49 CFR Part 26) and official guidance for the DBE program.

WBE Participation (Anticipated) - A portion of the total contract, expressed as a percentage that is anticipated to be performed by committed WBE subcontractor(s).

Women Business Enterprise (WBE) - A firm certified as a Disadvantaged Women-Owned Business Enterprise through the North Carolina Unified Certification Program.

Forms and Websites Referenced in this Provision

Payment Tracking System - On-line system in which the Contractor enters the payments made to MBE and WBE subcontractors who have performed work on the project. https://apps.dot.state.nc.us/Vendor/PaymentTracking/

DBE-IS *Subcontractor Payment Information* - Form for reporting the payments made to all MBE/WBE firms working on the project. This form is for paper bid projects only. https://connect.ncdot.gov/business/Turnpike/Documents/Form%20DBE-IS%20Subcontractor%20Payment%20Information.pdf

RF-1 *MBE/WBE Replacement Request Form* - Form for replacing a committed MBE or WBE. http://connect.ncdot.gov/projects/construction/Construction%20Forms/DBE%20MBE%20WBE%20Replacement%20Request%20Form.pdf

SAF *Subcontract Approval Form* - Form required for approval to sublet the contract. http://connect.ncdot.gov/projects/construction/Construction%20Forms/Subcontract%20Approval%20Form%20Rev.%202012.zip

JC-1 *Joint Check Notification Form* - Form and procedures for joint check notification. The form acts as a written joint check agreement among the parties providing full and prompt disclosure of the expected use of joint checks. http://connect.ncdot.gov/projects/construction/Construction%20Forms/Joint%20Check%20Notification%20Form.pdf

Letter of Intent - Form signed by the Contractor and the MBE/WBE subcontractor, manufacturer or regular dealer that affirms that a portion of said contract is going to be performed by the signed MBE/WBE for the estimated amount (based on quantities and unit prices) listed at the time of bid.

http://connect.ncdot.gov/letting/LetCentral/Letter%20of%20Intent%20to%20Perform%20as%20a%20Subcontractor.pdf

Listing of MBE and WBE Subcontractors Form - Form for entering MBE/WBE subcontractors on a project that will meet the Combined MBE/WBE goal. This form is for paper bids only.
http://connect.ncdot.gov/municipalities/Bid%20Proposals%20for%20LGA%20Content/09%20MBE-WBE%20Subcontractors%20(State).docx

Subcontractor Quote Comparison Sheet - Spreadsheet for showing all subcontractor quotes in the work areas where MBEs and WBEs quoted on the project. This sheet is submitted with good faith effort packages.
http://connect.ncdot.gov/business/SmallBusiness/Documents/DBE%20Subcontractor%20Quote%20Comparison%20Example.xls

Combined MBE/WBE Goal

The Combined MBE/WBE Goal for this project is **2.0%**

The Combined Goal was established utilizing the following anticipated participation for Minority Business Enterprises and Women Business Enterprises:

(A) Minority Business Enterprises **1.0%**

(1) *If the anticipated MBE participation is more than zero*, the Contractor shall exercise all necessary and reasonable steps to ensure that MBEs participate in at least the percent of the contract as set forth above.

(2) *If the anticipated MBE participation is zero*, the Contractor shall make an effort to recruit and use MBEs during the performance of the contract. Any MBE participation obtained shall be reported to the Department.

(B) Women Business Enterprises **1.0%**

(1) *If the anticipated WBE participation is more than zero*, the Contractor shall exercise all necessary and reasonable steps to ensure that WBEs participate in at least the percent of the contract as set forth above.

(2) *If the anticipated WBE participation is zero*, the Contractor shall make an effort to recruit and use WBEs during the performance of the contract. Any WBE participation obtained shall be reported to the Department.

The Bidder is required to submit only participation to meet the Combined MBE/WBE Goal. The Combined Goal may be met by submitting all MBE participation, all WBE participation, or a combination of MBE and WBE participation.

Directory of Transportation Firms (Directory)

Real-time information is available about firms doing business with the Department and firms that are certified through NCUCP in the Directory of Transportation Firms. Only firms identified in the

Directory as MBE and WBE certified shall be used to meet the Combined MBE / WBE goal. The Directory can be found at the following link.
https://www.ebs.nc.gov/VendorDirectory/default.html

The listing of an individual firm in the directory shall not be construed as an endorsement of the firm's capability to perform certain work.

Listing of MBE/WBE Subcontractors

At the time of bid, bidders shall submit all MBE and WBE participation that they anticipate to use during the life of the contract. Only those identified to meet the Combined MBE/WBE goal will be considered committed, even though the listing shall include both committed MBE/WBE subcontractors and additional MBE/WBE subcontractors. Any additional MBE/WBE subcontractor participation above the goal will follow the banking guidelines found elsewhere in this provision. All other additional MBE/WBE subcontractor participation submitted at the time of bid will be used toward the Department's overall race-neutral goals. Only those firms with current MBE and WBE certification at the time of bid opening will be acceptable for listing in the bidder's submittal of MBE and WBE participation. The Contractor shall indicate the following required information:

(A) Electronic Bids

Bidders shall submit a listing of MBE and WBE participation in the appropriate section of Expedite, the bidding software of Bid Express®.

(1) Submit the names and addresses of MBE and WBE firms identified to participate in the contract. If the bidder uses the updated listing of MBE and WBE firms shown in Expedite, the bidder may use the dropdown menu to access the name and address of the firms.

(2) Submit the contract line numbers of work to be performed by each MBE and WBE firm. When no figures or firms are entered, the bidder will be considered to have no MBE or WBE participation.

(3) The bidder shall be responsible for ensuring that the MBE and WBE are certified at the time of bid by checking the Directory of Transportation Firms. If the firm is not certified at the time of the bid-letting, that MBE's or WBE's participation will not count towards achieving the Combined MBE/WBE goal.

(B) Paper Bids

(1) *If the Combined MBE/ WBE goal is more than zero,*

(a) Bidders, at the time the bid proposal is submitted, shall submit a listing of MBE/WBE participation, including the names and addresses on *Listing of MBE and WBE Subcontractors* contained elsewhere in the contract documents in order for the bid to be considered responsive. Bidders shall indicate the total dollar value of the MBE and WBE participation for the contract.

(b) If bidders have no MBE or WBE participation, they shall indicate this on the *Listing of MBE and WBE Subcontractors* by entering the word "None" or the number "0." This form shall be completed in its entirety. **Blank forms will not be deemed to represent zero participation.** Bids submitted that do not have MBE and WBE participation indicated on the appropriate form will not be read publicly during the opening of bids. The Department will not consider these bids for award and the proposal will be rejected.

(c) The bidder shall be responsible for ensuring that the MBE/WBE is certified at the time of bid by checking the Directory of Transportation Firms. If the firm is not certified at the time of the bid-letting, that MBE's or WBE's participation will not count towards achieving the Combined MBE/WBE goal.

(2) *If the Combined MBE/WBE Goal is zero,* entries on the *Listing of MBE and WBE Subcontractors* are not required for the zero goal, however any MBE or WBE participation that is achieved during the project shall be reported in accordance with requirements contained elsewhere in the special provision.

MBE or WBE Prime Contractor

When a certified MBE or WBE firm bids on a contract that contains a Combined MBE/WBE Goal, the firm is responsible for meeting the goal or making good faith efforts to meet the goal, just like any other bidder. In most cases, a MBE or WBE bidder on a contract will meet the Combined MBE/WBE goal by virtue of the work it performs on the contract with its own forces. However, all the work that is performed by the MBE or WBE bidder and any other similarly certified subcontractors will count toward the goal. The MBE or WBE bidder shall list itself along with any MBE or WBE subcontractors, if any, in order to receive credit toward the goals.

MBE/WBE prime contractors shall also follow Sections A or B listed under *Listing of MBE/WBE Subcontractors* just as a non-MBE/WBE bidder would.

Written Documentation – Letter of Intent

The bidder shall submit written documentation for each MBE/WBE that will be used to meet the Combined MBE/WBE goal of the contract, indicating the bidder's commitment to use the MBE/WBE in the contract. This documentation shall be submitted on the Department's form titled *Letter of Intent.*

The documentation shall be received in the office of the Engineer no later than 2:00 p.m. of the fifth calendar day following opening of bids, unless the fifth day falls on Saturday, Sunday or an official state holiday. In that situation, it is due in the office of the Engineer no later than 10:00 a.m. on the next official state business day.

If the bidder fails to submit the Letter of Intent from each committed MBE and WBE to be used toward the Combined MBE/WBE goal, or if the form is incomplete (i.e. both signatures are not present), the MBE/WBE participation will not count toward meeting the Combined MBE/WBE goal. If the lack of this participation drops the commitment below the Combined MBE/WBE goal, the Contractor shall submit evidence of good faith efforts for the goal not met, completed in its

entirety, to the Engineer no later than 2:00 p.m. of the eighth calendar day following opening of bids, unless the eighth day falls on Saturday, Sunday or an official state holiday. In that situation, it is due in the office of the Engineer no later than 10:00 a.m. on the next official state business day.

Banking MBE/WBE Credit

If the committed MBE/WBE participation submitted exceeds the algebraic sum of the Combined MBE/WBE goal by $1,000 or more, the excess will be placed on deposit by the Department for future use by the bidder. Separate accounts will be maintained for MBE and WBE participation and these may accumulate for a period not to exceed 24 months.

When the apparent lowest responsive bidder fails to submit sufficient participation by MBE and WBE firms to meet the advertised goal, as part of the good faith effort, the Department will consider allowing the bidder to withdraw funds to meet the Combined MBE/WBE goal as long as there are adequate funds available from the bidder's MBE and WBE bank accounts.

Submission of Good Faith Effort

If the bidder fails to meet or exceed the Combined MBE/WBE goal, the apparent lowest responsive bidder shall submit to the Department documentation of adequate good faith efforts made to reach that specific goal.

One complete set and one electronic copy **(in .PDF format)** of this information shall be received in the office of the Engineer no later than 2:00 p.m. of the fifth calendar day following opening of bids, unless the fifth day falls on Saturday, Sunday or an official state holiday. In that situation, it is due in the office of the Engineer no later than 10:00 a.m. on the next official state business day.

Note: Where the information submitted includes repetitious solicitation letters, it will be acceptable to submit a representative letter along with a distribution list of the firms that were solicited. Documentation of MBE/WBE quotations shall be a part of the good faith effort submittal. This documentation may include written subcontractor quotations, telephone log notations of verbal quotations, or other types of quotation documentation.

Consideration of Good Faith Effort for Projects with a Combined MBE/WBE Goal More Than Zero

Adequate good faith efforts mean that the bidder took all necessary and reasonable steps to achieve the goal which, by their scope, intensity, and appropriateness, could reasonably be expected to obtain sufficient MBE/WBE participation. Adequate good faith efforts also mean that the bidder actively and aggressively sought MBE/WBE participation. Mere *pro forma* efforts are not considered good faith efforts.

The Department will consider the quality, quantity, and intensity of the different kinds of efforts a bidder has made. Listed below are examples of the types of actions a bidder will take in making a good faith effort to meet the goals and are not intended to be exclusive or exhaustive, nor is it intended to be a mandatory checklist.

(A) Soliciting through all reasonable and available means (e.g. attendance at pre-bid meetings, advertising, written notices, use of verifiable electronic means through the use of the

NCDOT Directory of Transportation Firms) the interest of all certified MBEs/WBEs that are also prequalified subcontractors. The bidder must solicit this interest within at least 10 days prior to bid opening to allow the MBEs/WBEs to respond to the solicitation. Solicitation shall provide the opportunity to MBEs/WBEs within the Division and surrounding Divisions where the project is located. The bidder must determine with certainty if the MBEs/WBEs are interested by taking appropriate steps to follow up initial solicitations.

(B) Selecting portions of the work to be performed by MBEs/WBEs in order to increase the likelihood that the Combined MBE/WBE goal will be achieved.

(1) Where appropriate, break out contract work items into economically feasible units to facilitate MBE/WBE participation, even when the prime contractor might otherwise prefer to perform these work items with its own forces.

(2) Negotiate with subcontractors to assume part of the responsibility to meet the advertised goal when the work to be sublet includes potential for MBE/WBE participation (2nd and 3rd tier subcontractors).

(C) Providing interested certified MBEs/WBEs that are also prequalified subcontractors with adequate information about the plans, specifications, and requirements of the contract in a timely manner to assist them in responding to a solicitation.

(D) (1) Negotiating in good faith with interested MBEs/WBEs. It is the bidder's responsibility to make a portion of the work available to MBE/WBE subcontractors and suppliers and to select those portions of the work or material needs consistent with the available MBE/WBE subcontractors and suppliers, so as to facilitate MBE/WBE participation. Evidence of such negotiation includes the names, addresses, and telephone numbers of MBEs/WBEs that were considered; a description of the information provided regarding the plans and specifications for the work selected for subcontracting; and evidence as to why additional agreements could not be reached for MBEs/WBEs to perform the work.

(2) A bidder using good business judgment would consider a number of factors in negotiating with subcontractors, including MBE/WBE subcontractors, and would take a firm's price and capabilities as well as the advertised goal into consideration. However, the fact that there may be some additional costs involved in finding and using MBEs/WBEs is not in itself sufficient reason for a bidder's failure to meet the advertised goal, as long as such costs are reasonable. Also, the ability or desire of a prime contractor to perform the work of a contract with its own organization does not relieve the bidder of the responsibility to make good faith efforts. Bidding contractors are not, however, required to accept higher quotes from MBEs/WBEs if the price difference is excessive or unreasonable.

(E) Not rejecting MBEs/WBEs as being unqualified without sound reasons based on a thorough investigation of their capabilities. The bidder's standing within its industry, membership in specific groups, organizations, or associates and political or social affiliations (for example, union vs. non-union employee status) are not legitimate causes for the rejection or non-solicitation of bids in the bidder's efforts to meet the project goal.

(F) Making efforts to assist interested MBEs/WBEs in obtaining bonding, lines of credit, or insurance as required by the recipient or bidder.

(G) Making efforts to assist interested MBEs/WBEs in obtaining necessary equipment, supplies, materials, or related assistance or services.

(H) Effectively using the services of available minority/women community organizations; minority/women contractors' groups; Federal, State, and local minority/women business assistance offices; and other organizations as allowed on a case-by-case basis to provide assistance in the recruitment and placement of MBEs/WBEs. Contact within 7 days from the bid opening the Business Opportunity and Work Force Development Unit at BOWD@ncdot.gov to give notification of the bidder's inability to get MBE or WBE quotes.

(I) Any other evidence that the bidder submits which shows that the bidder has made reasonable good faith efforts to meet the advertised goal.

In addition, the Department may take into account the following:

(1) Whether the bidder's documentation reflects a clear and realistic plan for achieving the Combined MBE/WBE goal.

(2) The bidders' past performance in meeting the contract goal.

(3) The performance of other bidders in meeting the advertised goal. For example, when the apparent successful bidder fails to meet the goal, but others meet it, you may reasonably raise the question of whether, with additional reasonable efforts the apparent successful bidder could have met the goal. If the apparent successful bidder fails to meet the advertised goal, but meets or exceeds the average MBE and WBE participation obtained by other bidders, the Department may view this, in conjunction with other factors, as evidence of the apparent successful bidder having made a good faith effort.

If the Department does not award the contract to the apparent lowest responsive bidder, the Department reserves the right to award the contract to the next lowest responsive bidder that can satisfy to the Department that the Combined MBE/WBE goal can be met or that an adequate good faith effort has been made to meet the advertised goal.

Non-Good Faith Appeal

The Engineer will notify the contractor verbally and in writing of non-good faith. A contractor may appeal a determination of non-good faith made by the Goal Compliance Committee. If a contractor wishes to appeal the determination made by the Committee, they shall provide written notification to the Engineer. The appeal shall be made within 2 business days of notification of the determination of non-good faith.

Counting MBE/WBE Participation Toward Meeting the Combined MBE/WBE Goal

(A) Participation

The total dollar value of the participation by a committed MBE/WBE will be counted toward the contract goal requirements. The total dollar value of participation by a committed MBE/WBE will be based upon the value of work actually performed by the MBE/WBE and the actual payments to MBE/WBE firms by the Contractor.

(B) Joint Checks

Prior notification of joint check use shall be required when counting MBE/WBE participation for services or purchases that involves the use of a joint check. Notification shall be through submission of Form JC-1 *(Joint Check Notification Form)* and the use of joint checks shall be in accordance with the Department's Joint Check Procedures.

(C) Subcontracts (Non-Trucking)

A MBE/WBE may enter into subcontracts. Work that a MBE subcontracts to another MBE firm may be counted toward the anticipated MBE participation. The same holds for work that a WBE subcontracts to another WBE firm. Work that a MBE/WBE subcontracts to a non-MBE/WBE firm does <u>not</u> count toward the contract goal requirement. It should be noted that every effort shall be made by MBE and WBE contractors to subcontract to the same certification (i.e., MBEs to MBEs and WBEs to WBEs), in order to fulfill the MBE or WBE participation breakdown. This, however, may not always be possible due to the limitation of firms in the area. If the MBE or WBE firm shows a good faith effort has been made to reach out to similarly certified firms and there is no interest or availability, and they can get assistance from other certified firms, the Engineer will not hold the prime responsible for meeting the individual MBE or WBE breakdown. If a MBE or WBE contractor or subcontractor subcontracts a significantly greater portion of the work of the contract than would be expected on the basis of standard industry practices, it shall be presumed that the MBE or WBE is not performing a commercially useful function.

(D) Joint Venture

When a MBE or WBE performs as a participant in a joint venture, the Contractor may count toward its contract goal requirement a portion of the total value of participation with the MBE or WBE in the joint venture, that portion of the total dollar value being a distinct clearly defined portion of work that the MBE or WBE performs with its forces.

(E) Suppliers

A contractor may count toward its MBE /WBE requirement 60 percent of its expenditures for materials and supplies required to complete the contract and obtained from a MBE or WBE regular dealer and 100 percent of such expenditures from a MBE or WBE manufacturer.

(F) Manufacturers and Regular Dealers

A contractor may count toward its MBE /WBE requirement the following expenditures to MBE/WBE firms that are not manufacturers or regular dealers:

(1) The fees or commissions charged by a MBE/WBE firm for providing a *bona fide* service, such as professional, technical, consultant, or managerial services, or for providing bonds or insurance specifically required for the performance of a DOT-assisted contract, provided the fees or commissions are determined to be reasonable and not excessive as compared with fees and commissions customarily allowed for similar services.

(2) With respect to materials or supplies purchased from a MBE/WBE, which is neither a manufacturer nor a regular dealer, count the entire amount of fees or commissions charged for assistance in the procurement of the materials and supplies, or fees or transportation charges for the delivery of materials or supplies required on a job site (but not the cost of the materials and supplies themselves), provided the fees are determined to be reasonable and not excessive as compared with fees customarily allowed for similar services.

Commercially Useful Function

(A) MBE/WBE Utilization

The Contractor may count toward its contract goal requirement only expenditures to MBEs and WBEs that perform a commercially useful function in the work of a contract. A MBE/WBE performs a commercially useful function when it is responsible for execution of the work of the contract and is carrying out its responsibilities by actually performing, managing, and supervising the work involved. To perform a commercially useful function, the MBE/WBE shall also be responsible with respect to materials and supplies used on the contract, for negotiating price, determining quality and quantity, ordering the material and installing (where applicable) and paying for the material itself. To determine whether a MBE/WBE is performing a commercially useful function, the Department will evaluate the amount of work subcontracted, industry practices, whether the amount the firm is to be paid under the contract is commensurate with the work it is actually performing and the MBE/WBE credit claimed for its performance of the work, and any other relevant factors. If it is determined that a MBE or WBE is not performing a Commercially Useful Function, the contractor may present evidence to rebut this presumption to the Department.

(B) MBE/WBE Utilization in Trucking

The following factors will be used to determine if a MBE or WBE trucking firm is performing a commercially useful function:

(1) The MBE/WBE shall be responsible for the management and supervision of the entire trucking operation for which it is responsible on a particular contract, and there shall not be a contrived arrangement for the purpose of meeting the Combined MBE/WBE goal.

(2) The MBE/WBE shall itself own and operate at least one fully licensed, insured, and operational truck used on the contract.

(3) The MBE/WBE receives credit for the total value of the transportation services it provides on the contract using trucks it owns, insures, and operates using drivers it employs.

(4) The MBE may subcontract the work to another MBE firm, including an owner-operator who is certified as a MBE. The same holds true that a WBE may subcontract the work to another WBE firm, including an owner-operator who is certified as a WBE. When this occurs, the MBE or WBE who subcontracts work receives credit for the total value of the transportation services the subcontracted MBE or WBE provides on the contract. It should be noted that every effort shall be made by MBE and WBE contractors to subcontract to the same certification (i.e., MBEs to MBEs and WBEs to WBEs), in order to fulfill the participation breakdown. This, however, may not always be possible due to the limitation of firms in the area. If the MBE or WBE firm shows a good faith effort has been made to reach out to similarly certified transportation service providers and there is no interest or availability, and they can get assistance from other certified providers, the Engineer will not hold the prime responsible for meeting the individual MBE or WBE participation breakdown.

(5) The MBE/WBE may also subcontract the work to a non-MBE/WBE firm, including from an owner-operator. The MBE/WBE who subcontracts the work to a non-MBE/WBE is entitled to credit for the total value of transportation services provided by the non-MBE/WBE subcontractor not to exceed the value of transportation services provided by MBE/WBE-owned trucks on the contract. Additional participation by non-MBE/WBE subcontractors receives credit only for the fee or commission it receives as a result of the subcontract arrangement. The value of services performed under subcontract agreements between the MBE/WBE and the Contractor will not count towards the MBE/WBE contract requirement.

(6) A MBE/WBE may lease truck(s) from an established equipment leasing business open to the general public. The lease must indicate that the MBE/WBE has exclusive use of and control over the truck. This requirement does not preclude the leased truck from working for others during the term of the lease with the consent of the MBE/WBE, so long as the lease gives the MBE/WBE absolute priority for use of the leased truck. This type of lease may count toward the MBE/WBE's credit as long as the driver is under the MBE/WBE's payroll.

(7) Subcontracted/leased trucks shall display clearly on the dashboard the name of the MBE/WBE that they are subcontracted/leased to and their own company name if it is not identified on the truck itself. Magnetic door signs are not permitted.

MBE/WBE Replacement

When a Contractor has relied on a commitment to a MBE or WBE subcontractor (or an approved substitute MBE or WBE subcontractor) to meet all or part of a contract goal requirement, the contractor shall not terminate the MBE/WBE subcontractor for convenience. This includes, but is not limited to, instances in which the Contractor seeks to perform the work of the terminated

subcontractor with another MBE/WBE subcontractor, a non-MBE/WBE subcontractor, or with the Contractor's own forces or those of an affiliate.

The Contractor must give notice in writing both by certified mail and email to the MBE/WBE subcontractor, with a copy to the Engineer of its intent to request to terminate and/or substitute, and the reason for the request. The Contractor must give the MBE/WBE subcontractor five (5) business days to respond to the Contractor's Notice of Intent to Request Termination and/or Substitution. If the MBE/WBE subcontractor objects to the intended termination/substitution, the MBE/WBE, within five (5) business days must advise the Contractor and the Department of the reasons why the action should not be approved. The five-day notice period shall begin on the next business day after written notice is provided to the MBE/WBE subcontractor.

A committed MBE/WBE subcontractor may only be terminated after receiving the Department's written approval based upon a finding of good cause for the proposed termination and/or substitution. For purposes of this section, good cause shall include the following circumstances:

(a) The listed MBE/WBE subcontractor fails or refuses to execute a written contract;
(b) The listed MBE/WBE subcontractor fails or refuses to perform the work of its subcontract in a way consistent with normal industry standards. Provided, however, that good cause does not exist if the failure or refusal of the MBE/WBE subcontractor to perform its work on the subcontract results from the bad faith or discriminatory action of the prime contractor;
(c) The listed MBE/WBE subcontractor fails or refuses to meet the prime contractor's reasonable, nondiscriminatory bond requirements;
(d) The listed MBE/WBE subcontractor becomes bankrupt, insolvent, or exhibits credit unworthiness;
(e) The listed MBE/WBE subcontractor is ineligible to work on public works projects because of suspension and debarment proceedings pursuant to 2 CFR Parts 180, 215 and 1,200 or applicable state law;
(f) The listed MBE/WBE subcontractor is not a responsible contractor;
(g) The listed MBE/WBE voluntarily withdraws from the project and provides written notice of withdrawal;
(h) The listed MBE/WBE is ineligible to receive MBE/WBE credit for the type of work required;
(i) A MBE/WBE owner dies or becomes disabled with the result that the listed MBE/WBE contractor is unable to complete its work on the contract;
(j) Other documented good cause that compels the termination of the MBE/WBE subcontractor. Provided, that good cause does not exist if the prime contractor seeks to terminate a MBE/WBE it relied upon to obtain the contract so that the prime contractor can self-perform the work for which the MBE/WBE contractor was engaged or so that the prime contractor can substitute another MBE/WBE or non-MBE/WBE contractor after contract award.

The Contractor shall comply with the following for replacement of a committed MBE/WBE:

(A) Performance Related Replacement

When a committed MBE/WBE is terminated for good cause as stated above, an additional MBE/WBE that was submitted at the time of bid may be used to fulfill the MBE/WBE commitment to meet the Combined MBE/WBE Goal. A good faith effort will only be

required for removing a committed MBE/WBE if there were no additional MBE/WBEs submitted at the time of bid to cover the same amount of work as the MBE/WBE that was terminated.

If a replacement MBE/WBE is not found that can perform at least the same amount of work as the terminated MBE/WBE, the Contractor shall submit a good faith effort documenting the steps taken. Such documentation shall include, but not be limited to, the following:

(1) Copies of written notification to MBE/WBEs that their interest is solicited in contracting the work defaulted by the previous MBE/WBE or in subcontracting other items of work in the contract.

(2) Efforts to negotiate with MBE/WBEs for specific subbids including, at a minimum:

(a) The names, addresses, and telephone numbers of MBE/WBEs who were contacted.
(b) A description of the information provided to MBE/WBEs regarding the plans and specifications for portions of the work to be performed.

(3) A list of reasons why MBE/WBE quotes were not accepted.

(4) Efforts made to assist the MBE/WBEs contacted, if needed, in obtaining bonding or insurance required by the Contractor.

(B) Decertification Replacement

(1) When a committed MBE/WBE is decertified by the Department after the SAF (*Subcontract Approval Form*) has been received by the Department, the Department will not require the Contractor to solicit replacement MBE/WBE participation equal to the remaining work to be performed by the decertified firm. The participation equal to the remaining work performed by the decertified firm will count toward the contract goal requirement.

(2) When a committed MBE/WBE is decertified prior to the Department receiving the SAF (*Subcontract Approval Form*) for the named MBE/WBE firm, the Contractor shall take all necessary and reasonable steps to replace the MBE/WBE subcontractor with another MBE/WBE subcontractor to perform at least the same amount of work to meet the Combined MBE/WBE goal requirement. If a MBE/WBE firm is not found to do the same amount of work, a good faith effort must be submitted to NCDOT (see A herein for required documentation).

All requests for replacement of a committed MBE/WBE firm shall be submitted to the Engineer for approval on Form RF-1 *(DBE Replacement Request)*. If the Contractor fails to follow this procedure, the Contractor may be disqualified from further bidding for a period of up to 6 months.

Changes in the Work

When the Engineer makes changes that result in the reduction or elimination of work to be performed by a committed MBE/WBE, the Contractor will not be required to seek additional

participation. When the Engineer makes changes that result in additional work to be performed by a MBE/WBE based upon the Contractor's commitment, the MBE/WBE shall participate in additional work to the same extent as the MBE/WBE participated in the original contract work.

When the Engineer makes changes that result in extra work, which has more than a minimal impact on the contract amount, the Contractor shall seek additional participation by MBEs/WBEs unless otherwise approved by the Engineer.

When the Engineer makes changes that result in an alteration of plans or details of construction, and a portion or all of the work had been expected to be performed by a committed MBE/WBE, the Contractor shall seek participation by MBEs/WBEs unless otherwise approved by the Engineer.

When the Contractor requests changes in the work that result in the reduction or elimination of work that the Contractor committed to be performed by a MBE/WBE, the Contractor shall seek additional participation by MBEs/WBEs equal to the reduced MBE/WBE participation caused by the changes.

Reports and Documentation

A SAF (*Subcontract Approval Form*) shall be submitted for all work which is to be performed by a MBE/WBE subcontractor. The Department reserves the right to require copies of actual subcontract agreements involving MBE/WBE subcontractors.

When using transportation services to meet the contract commitment, the Contractor shall submit a proposed trucking plan in addition to the SAF. The plan shall be submitted prior to beginning construction on the project. The plan shall include the names of all trucking firms proposed for use, their certification type(s), the number of trucks owned by the firm, as well as the individual truck identification numbers, and the line item(s) being performed.

Within 30 calendar days of entering into an agreement with a MBE/WBE for materials, supplies or services, not otherwise documented by the SAF as specified above, the Contractor shall furnish the Engineer a copy of the agreement. The documentation shall also indicate the percentage (60% or 100%) of expenditures claimed for MBE/WBE credit.

Reporting Minority and Women Business Enterprise Participation

The Contractor shall provide the Engineer with an accounting of payments made to all MBE and WBE firms, including material suppliers and contractors at all levels (prime, subcontractor, or second tier subcontractor). This accounting shall be furnished to the Engineer for any given month by the end of the following month. Failure to submit this information accordingly may result in the following action:

(A) Withholding of money due in the next partial pay estimate; or

(B) Removal of an approved contractor from the prequalified bidders' list or the removal of other entities from the approved subcontractors list.

While each contractor (prime, subcontractor, 2nd tier subcontractor) is responsible for accurate accounting of payments to MBEs/WBEs, it shall be the prime contractor's responsibility to report all monthly and final payment information in the correct reporting manner.

Failure on the part of the Contractor to submit the required information in the time frame specified may result in the disqualification of that contractor and any affiliate companies from further bidding until the required information is submitted.

Failure on the part of any subcontractor to submit the required information in the time frame specified may result in the disqualification of that contractor and any affiliate companies from being approved for further work on future projects until the required information is submitted.

Contractors reporting transportation services provided by non-MBE/WBE lessees shall evaluate the value of services provided during the month of the reporting period only.

At any time, the Engineer can request written verification of subcontractor payments.
The Contractor shall report the accounting of payments through the Department's DBE Payment Tracking System.

Failure to Meet Contract Requirements

Failure to meet contract requirements in accordance with Subarticle 102-15(J) of the *2018 Standard Specifications* may be cause to disqualify the Contractor.

FUEL PRICE ADJUSTMENT:

(11-15-05) (Rev. 2-18-14) 109-8 SP1 G43

Revise the *2018 Standard Specifications* as follows:

Page 1-87, Article 109-8, Fuel Price Adjustments, add the following:

The base index price for DIESEL #2 FUEL is **$2.0412** per gallon. Where any of the following are included as pay items in the contract, they will be eligible for fuel price adjustment.

The pay items and the fuel factor used in calculating adjustments to be made will be as follows:

Description	Units	Fuel Usage Factor Diesel
Unclassified Excavation	Gal/CY	0.29
Borrow Excavation	Gal/CY	0.29
Class IV Subgrade Stabilization	Gal/Ton	0.55
Aggregate Base Course	Gal/Ton	0.55
Sub-Ballast	Gal/Ton	0.55
Asphalt Concrete Base Course, Type ____	Gal/Ton	2.90
Asphalt Concrete Intermediate Course, Type ____	Gal/Ton	2.90
Asphalt Concrete Surface Course, Type ____	Gal/Ton	2.90
Open-Graded Asphalt Friction Course	Gal/Ton	2.90
Permeable Asphalt Drainage Course, Type ____	Gal/Ton	2.90
Sand Asphalt Surface Course, Type ____	Gal/Ton	2.90
Aggregate for Cement Treated Base Course	Gal/Ton	0.55

Portland Cement for Cement Treated Base Course	Gal/Ton	0.55
__" Portland Cement Concrete Pavement	Gal/SY	0.245
Concrete Shoulders Adjacent to __" Pavement	Gal/SY	0.245

SUBSURFACE INFORMATION:

(7-1-95) 450 SP1 G112 A

There is **no** subsurface information available on this project. The Contractor shall make his own investigation of subsurface conditions.

OUTSOURCING OUTSIDE THE USA:

(9-21-04) (Rev. 5-16-06) SP1 G150

All work on consultant contracts, services contracts, and construction contracts shall be performed in the United States of America. No work shall be outsourced outside of the United States of America.

Outsourcing for the purpose of this provision is defined as the practice of subcontracting labor, work, services, staffing, or personnel to entities located outside of the United States.

The North Carolina Secretary of Transportation shall approve exceptions to this provision in writing.

EROSION AND SEDIMENT CONTROL/STORMWATER CERTIFICATION:

(1-16-07) (Rev 11-22-16) 105-16, 225-2, 16 SP1 G180

General

Schedule and conduct construction activities in a manner that will minimize soil erosion and the resulting sedimentation and turbidity of surface waters. Comply with the requirements herein regardless of whether or not a National Pollution discharge Elimination System (NPDES) permit for the work is required.

Establish a chain of responsibility for operations and subcontractors' operations to ensure that the *Erosion and Sediment Control/Stormwater Pollution Prevention Plan* is implemented and maintained over the life of the contract.

(A) *Certified Supervisor* - Provide a certified Erosion and Sediment Control/Stormwater Supervisor to manage the Contractor and subcontractor operations, insure compliance with Federal, State and Local ordinances and regulations, and manage the Quality Control Program.

(B) *Certified Foreman* - Provide a certified, trained foreman for each construction operation that increases the potential for soil erosion or the possible sedimentation and turbidity of surface waters.

(C) *Certified Installer* - Provide a certified installer to install or direct the installation for erosion or sediment/stormwater control practices.

(D) *Certified Designer* - Provide a certified designer for the design of the erosion and sediment control/stormwater component of reclamation plans and, if applicable, for the design of the project erosion and sediment control/stormwater plan.

Roles and Responsibilities

(A) *Certified Erosion and Sediment Control/Stormwater Supervisor* - The Certified Supervisor shall be Level II and responsible for ensuring the erosion and sediment control/stormwater plan is adequately implemented and maintained on the project and for conducting the quality control program. The Certified Supervisor shall be on the project within 24 hours notice from initial exposure of an erodible surface to the project's final acceptance. Perform the following duties:

(1) Manage Operations - Coordinate and schedule the work of subcontractors so that erosion and sediment control/stormwater measures are fully executed for each operation and in a timely manner over the duration of the contract.

(a) Oversee the work of subcontractors so that appropriate erosion and sediment control/stormwater preventive measures are conformed to at each stage of the work.
(b) Prepare the required National Pollutant Discharge Elimination System (NPDES) Inspection Record and submit to the Engineer.
(c) Attend all weekly or monthly construction meetings to discuss the findings of the NPDES inspection and other related issues.
(d) Implement the erosion and sediment control/stormwater site plans requested.
(e) Provide any needed erosion and sediment control/stormwater practices for the Contractor's temporary work not shown on the plans, such as, but not limited to work platforms, temporary construction, pumping operations, plant and storage yards, and cofferdams.
(f) Acquire applicable permits and comply with requirements for borrow pits, dewatering, and any temporary work conducted by the Contractor in jurisdictional areas.
(g) Conduct all erosion and sediment control/stormwater work in a timely and workmanlike manner.
(h) Fully perform and install erosion and sediment control/stormwater work prior to any suspension of the work.
(i) Coordinate with Department, Federal, State and Local Regulatory agencies on resolution of erosion and sediment control/stormwater issues due to the Contractor's operations.
(j) Ensure that proper cleanup occurs from vehicle tracking on paved surfaces or any location where sediment leaves the Right-of-Way.
(k) Have available a set of erosion and sediment control/stormwater plans that are initialed and include the installation date of Best Management Practices. These practices shall include temporary and permanent groundcover and be properly updated to reflect necessary plan and field changes for use and review by Department personnel as well as regulatory agencies.

(2) Requirements set forth under the NPDES Permit - The Department's NPDES Stormwater permit (NCS000250) outlines certain objectives and management

measures pertaining to construction activities. The permit references *NCG010000, General Permit to Discharge Stormwater* under the NPDES, and states that the Department shall incorporate the applicable requirements into its delegated Erosion and Sediment Control Program for construction activities disturbing one or more acres of land. The Department further incorporates these requirements on all contracted bridge and culvert work at jurisdictional waters, regardless of size. Some of the requirements are, but are not limited to:

(a) Control project site waste to prevent contamination of surface or ground waters of the state, i.e. from equipment operation/maintenance, construction materials, concrete washout, chemicals, litter, fuels, lubricants, coolants, hydraulic fluids, any other petroleum products, and sanitary waste.
(b) Inspect erosion and sediment control/stormwater devices and stormwater discharge outfalls at least once every 7 calendar days and within 24 hours after a rainfall event of 0.5 inch that occurs within a 24 hour period. Additional monitoring may be required at the discretion of Division of Water Resources personnel if the receiving stream is 303(d) listed for turbidity and the project has had documented problems managing turbidity.
(c) Maintain an onsite rain gauge or use the Department's Multi-Sensor Precipitation Estimate website to maintain a daily record of rainfall amounts and dates.
(d) Maintain erosion and sediment control/stormwater inspection records for review by Department and Regulatory personnel upon request.
(e) Implement approved reclamation plans on all borrow pits, waste sites and staging areas.
(f) Maintain a log of turbidity test results as outlined in the Department's Procedure for Monitoring Borrow Pit Discharge.
(g) Provide secondary containment for bulk storage of liquid materials.
(h) Provide training for employees concerning general erosion and sediment control/stormwater awareness, the Department's NPDES Stormwater Permit NCS000250 requirements, and the applicable requirements of the *General Permit, NCG010000*.
(i) Report violations of the NPDES permit to the Engineer immediately who will notify the Division of Water Quality Regional Office within 24 hours of becoming aware of the violation.

(3) Quality Control Program - Maintain a quality control program to control erosion, prevent sedimentation and follow provisions/conditions of permits. The quality control program shall:

(a) Follow permit requirements related to the Contractor and subcontractors' construction activities.
(b) Ensure that all operators and subcontractors on site have the proper erosion and sediment control/stormwater certification.
(c) Notify the Engineer when the required certified erosion and sediment control/stormwater personnel are not available on the job site when needed.
(d) Conduct the inspections required by the NPDES permit.
(e) Take corrective actions in the proper timeframe as required by the NPDES permit for problem areas identified during the NPDES inspections.

(f) Incorporate erosion control into the work in a timely manner and stabilize disturbed areas with mulch/seed or vegetative cover on a section-by-section basis.

(g) Use flocculants approved by state regulatory authorities where appropriate and where required for turbidity and sedimentation reduction.

(h) Ensure proper installation and maintenance of temporary erosion and sediment control devices.

(i) Remove temporary erosion or sediment control devices when they are no longer necessary as agreed upon by the Engineer.

(j) The Contractor's quality control and inspection procedures shall be subject to review by the Engineer. Maintain NPDES inspection records and make records available at all times for verification by the Engineer.

(B) *Certified Foreman* - At least one Certified Foreman shall be onsite for each type of work listed herein during the respective construction activities to control erosion, prevent sedimentation and follow permit provisions:

(1) Foreman in charge of grading activities
(2) Foreman in charge of bridge or culvert construction over jurisdictional areas
(3) Foreman in charge of utility activities

The Contractor may request to use the same person as the Level II Supervisor and Level II Foreman. This person shall be onsite whenever construction activities as described above are taking place. This request shall be approved by the Engineer prior to work beginning.

The Contractor may request to name a single Level II Foreman to oversee multiple construction activities on small bridge or culvert replacement projects. This request shall be approved by the Engineer prior to work beginning.

(C) *Certified Installers* - Provide at least one onsite, Level I Certified Installer for each of the following erosion and sediment control/stormwater crew:

(1) Seeding and Mulching
(2) Temporary Seeding
(3) Temporary Mulching
(4) Sodding
(5) Silt fence or other perimeter erosion/sediment control device installations
(6) Erosion control blanket installation
(7) Hydraulic tackifier installation
(8) Turbidity curtain installation
(9) Rock ditch check/sediment dam installation
(10) Ditch liner/matting installation
(11) Inlet protection
(12) Riprap placement
(13) Stormwater BMP installations (such as but not limited to level spreaders, retention/detention devices)
(14) Pipe installations within jurisdictional areas

If a Level I *Certified Installer* is not onsite, the Contractor may substitute a Level II Foreman for a Level I Installer, provided the Level II Foreman is not tasked to another crew requiring Level II Foreman oversight.

(D) *Certified Designer* - Include the certification number of the Level III-B Certified Designer on the erosion and sediment control/stormwater component of all reclamation plans and if applicable, the certification number of the Level III-A Certified Designer on the design of the project erosion and sediment control/stormwater plan.

Preconstruction Meeting

Furnish the names of the *Certified Erosion and Sediment Control/Stormwater Supervisor, Certified Foremen, Certified Installers* and *Certified Designer* and notify the Engineer of changes in certified personnel over the life of the contract within 2 days of change.

Ethical Responsibility

Any company performing work for the North Carolina Department of Transportation has the ethical responsibility to fully disclose any reprimand or dismissal of an employee resulting from improper testing or falsification of records.

Revocation or Suspension of Certification

Upon recommendation of the Chief Engineer to the certification entity, certification for *Supervisor, Certified Foremen, Certified Installers* and *Certified Designer* may be revoked or suspended with the issuance of an *Immediate Corrective Action (ICA), Notice of Violation (NOV),* or C*ease and Desist Order* for erosion and sediment control/stormwater related issues.

The Chief Engineer may recommend suspension or permanent revocation of certification due to the following:

(A) Failure to adequately perform the duties as defined within this certification provision.
(B) Issuance of an ICA, NOV, or Cease and Desist Order.
(C) Failure to fully perform environmental commitments as detailed within the permit conditions and specifications.
(D) Demonstration of erroneous documentation or reporting techniques.
(E) Cheating or copying another candidate’s work on an examination.
(F) Intentional falsification of records.
(G) Directing a subordinate under direct or indirect supervision to perform any of the above actions.
(H) Dismissal from a company for any of the above reasons.
(I) Suspension or revocation of one’s certification by another entity.

Suspension or revocation of a certification will be sent by certified mail to the certificant and the Corporate Head of the company that employs the certificant.

A certificant has the right to appeal any adverse action which results in suspension or permanent revocation of certification by responding, in writing, to the Chief Engineer within 10 calendar days after receiving notice of the proposed adverse action.

Chief Engineer
1536 Mail Service Center
Raleigh, NC 27699-1536

Failure to appeal within 10 calendar days will result in the proposed adverse action becoming effective on the date specified on the certified notice. Failure to appeal within the time specified will result in a waiver of all future appeal rights regarding the adverse action taken. The certificant will not be allowed to perform duties associated with the certification during the appeal process.

The Chief Engineer will hear the appeal and make a decision within 7 days of hearing the appeal. Decision of the Chief Engineer will be final and will be made in writing to the certificant.

If a certification is temporarily suspended, the certificant shall pass any applicable written examination and any proficiency examination, at the conclusion of the specified suspension period, prior to having the certification reinstated.

Measurement and Payment

Certified Erosion and Sediment Control/Stormwater Supervisor, Certified Foremen, Certified Installers and *Certified Designer* will be incidental to the project for which no direct compensation will be made.

PROCEDURE FOR MONITORING BORROW PIT DISCHARGE:

(2-20-07) (Rev. 3-19-13) 105-16, 230, 801 SP1 G181

Water discharge from borrow pit sites shall not cause surface waters to exceed 50 NTUs (nephelometric turbidity unit) in streams not designated as trout waters and 10 NTUs in streams, lakes or reservoirs designated as trout waters. For lakes and reservoirs not designated as trout waters, the turbidity shall not exceed 25 NTUs. If the turbidity exceeds these levels due to natural background conditions, the existing turbidity level shall not be increased.

If during any operating day, the downstream water quality exceeds the standard, the Contractor shall do all of the following:

(A) Either cease discharge or modify the discharge volume or turbidity levels to bring the downstream turbidity levels into compliance, or

(B) Evaluate the upstream conditions to determine if the exceedance of the standard is due to natural background conditions. If the background turbidity measurements exceed the standard, operation of the pit and discharge can continue as long as the stream turbidity levels are not increased due to the discharge.

(C) Measure and record the turbidity test results (time, date and sampler) at all defined sampling locations 30 minutes after startup and at a minimum, one additional sampling of all sampling locations during that 24-hour period in which the borrow pit is discharging.

(D) Notify DWQ within 24 hours of any stream turbidity standard exceedances that are not brought into compliance.

During the Environmental Assessment required by Article 230-4 of the *2018 Standard Specifications*, the Contractor shall define the point at which the discharge enters into the State's surface waters and the appropriate sampling locations. Sampling locations shall include points upstream and downstream from the point at which the discharge enters these waters. Upstream sampling location shall be located so that it is not influenced by backwater conditions and represents natural background conditions. Downstream sampling location shall be located at the point where complete mixing of the discharge and receiving water has occurred.

The discharge shall be closely monitored when water from the dewatering activities is introduced into jurisdictional wetlands. Any time visible sedimentation (deposition of sediment) on the wetland surface is observed, the dewatering activity will be suspended until turbidity levels in the stilling basin can be reduced to a level where sediment deposition does not occur. Staining of wetland surfaces from suspended clay particles, occurring after evaporation or infiltration, does not constitute sedimentation. No activities shall occur in wetlands that adversely affect the functioning of a wetland. Visible sedimentation will be considered an indication of possible adverse impacts on wetland use.

The Engineer will perform independent turbidity tests on a random basis. These results will be maintained in a log within the project records. Records will include, at a minimum, turbidity test results, time, date and name of sampler. Should the Department's test results exceed those of the Contractor's test results, an immediate test shall be performed jointly with the results superseding the previous test results of both the Department and the Contractor.

The Contractor shall use the *NCDOT Turbidity Reduction Options for Borrow Pits Matrix*, available at: https://connect.ncdot.gov/resources/roadside/FieldOperationsDocuments/TurbidityReductionOptionSheet.pdf to plan, design, construct, and maintain BMPs to address water quality standards. Tier I Methods include stilling basins which are standard compensatory BMPs. Other Tier I methods are noncompensatory and shall be used when needed to meet the stream turbidity standards. Tier II Methods are also noncompensatory and are options that may be needed for protection of rare or unique resources or where special environmental conditions exist at the site which have led to additional requirements being placed in the DWQ's 401 Certifications and approval letters, Isolated Wetland Permits, Riparian Buffer Authorization or a DOT Reclamation Plan's Environmental Assessment for the specific site. Should the Contractor exhaust all Tier I Methods on a site exclusive of rare or unique resources or special environmental conditions, Tier II Methods may be required by regulators on a case by case basis per supplemental agreement.

The Contractor may use cation exchange capacity (CEC) values from proposed site borings to plan and develop the bid for the project. CEC values exceeding 15 milliequivalents per 100 grams of soil may indicate a high potential for turbidity and should be avoided when dewatering into surface water is proposed.

No additional compensation for monitoring borrow pit discharge will be paid.

PROJECT SPECIAL PROVISIONS

ROADWAY

CLEARING AND GRUBBING - METHOD II:

(9-17-02) (Rev.8-18-15) 200 SP2 R02A

Perform clearing on this project to the limits established by Method "II" shown on Standard Drawing No. 200.02 of the *2018 Roadway Standard Drawings*. Conventional clearing methods may be used except where permit drawings or conditions have been included in the proposal which require certain areas to be cleared by hand methods.

BURNING RESTRICTIONS:

(7-1-95) 200, 210, 215 SP2 R05

Open burning is not permitted on any portion of the right-of-way limits established for this project. Do not burn the clearing, grubbing or demolition debris designated for disposal and generated from the project at locations within the project limits, off the project limits or at any waste or borrow sites in this county. Dispose of the clearing, grubbing and demolition debris by means other than burning, according to state or local rules and regulations.

TECHNICAL SPECIFICATIONS

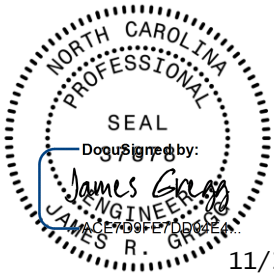
FOR

I-95 Water Main Extension and Replacement

North Carolina Department of Transportation
Nash County, North Carolina

3253-B

NOVEMBER 2018



11/30/18

James R Gregg, P.E.

THE WOOTEN COMPANY
ENGINEERING | PLANNING | ARCHITECTURE
120 North Boylan Avenue Raleigh NC 27603-1423
919.828.0531 fax 919.834.3589
License No. F-0115

TABLE OF CONTENTS

END OF DOCUMENT

SECTION 01100

SUMMARY OF WORK

PART 1 GENERAL

1.01 WORK COVERED BY CONTRACT DOCUMENTS

A. Work described in this Project Manual includes the provision of labor, materials, equipment, and services required to complete the I-95 Water Main Extension and Replacement project for the North Carolina Department of Transportation.

B. The North Carolina Department of Transportation's 2018 *Standard Specifications for Road and Structures*, as it relates to these Sections, shall be used in conjunction with these specifications. All aspects of the project construction shall conform to this document unless specifically addressed herein. It is the Contractors responsibility to obtain this document from the North Carolina Department of Transportation.

C. In the event of a discrepancy between these specifications and the Owner's standards, notify the engineer immediately of the discrepancy. The Contractor shall use the more stringent of the two documents as determined by the Owner.

1.02 CONTRACTS

A. Project construction will be let under one Contract with construction including, but not limited to, the following major work items:

- Approx. 2,150 LF of 6" water main and appurtenances by open cut
- Approx. 50 LF of 3" water main and appurtenances by open cut
- Approx. 1,300 LF of 6" water main by horizontal directional drill

1.03 WORK SEQUENCE

A. Contractor shall attend Pre-Construction conference with Owner and Engineer prior to construction. Traffic control plans detailing lane closures shall be submitted prior to construction.

B. Contractor shall coordinate with Owner and Engineer for connection points and division of work as shown on the drawings.

C. Construction Progress Schedule, as required in Section 01330, Submittal Procedures, shall indicate the anticipated items and times that the Work will interfere with normal facility operation.

D. Indicate switchovers and cut-ins between new work and existing facility on the construction schedule. Submit proposed date for switchover in writing to Engineer and Owner a minimum of seven (7) days and again 24-hours in advance of actual field work. Owner shall have the right to delay Work due to operational requirements, without additional cost to Owner.

E. Perform switchovers and cut-ins during low flow periods at the facility. This may require night / weekend operations by Contractor at no additional compensation.

1.04 OWNER OCCUPANCY

A. Owner will occupy site during entire period of construction.

B. Contractors shall cooperate with Owner to minimize conflict, and to facilitate Owner's operations.

1.05 CONTRACTOR USE OF SITE

A. Only Owner’s right to perform construction and maintenance operations with its own forces and to employ separate contractors on portions of the Project limits contractor’s use of site during the construction period. Work at the Project site by Owner will be coordinated with the Contractor.

B. Contractor shall provide his own staging area as necessary for his Work.

1.06 OTHER CONTRACTS

1. None

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

END OF SECTION

SECTION 01312

PROJECT COORDINATION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. This Section specifies administrative and supervisory requirements necessary for Project coordination including, but not necessarily limited to:
   1. Coordination.
   2. Administrative and supervisory personnel.
   3. General installation provisions.
   4. Cleaning and protection.

1.02 GENERAL COORDINATION REQUIREMENTS

A. Responsibilities of Contractor:
   1. Coordinate construction activities for the Project to assure efficient and proper installation of each part of the Work.
   2. Where availability of space is limited, coordinate installation of components to assure maximum accessibility for maintenance. Make adequate provisions to accommodate components scheduled for later installation.
   3. Where necessary, prepare memoranda for distribution to each party involved outlining special procedures required for coordination. Include such items as required notices, reports, and attendance at meetings. A copy of all memoranda shall be submitted to the Engineer.

B. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities to avoid conflicts and ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:
   1. Preparation of schedules.
   2. Installation and removal of temporary facilities.
   3. Delivery and processing of submittals.
   4. Progress meetings.
   5. Installation meetings.
   6. Project Close-out activities.

C. Conservation: Coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water, and materials.
   1. Salvage materials and equipment involved in performance of, but not actually incorporated in, the Work. Refer to other sections for disposition of salvaged materials that are designated as Owner's property.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION – NOT USED

END OF SECTION

SECTION 01314

PROJECT MEETINGS

PART 1 GENERAL

1.01 MEETINGS

A. Pre-construction conference shall be held prior to the beginning of the Work.

B. Construction progress meetings shall be held monthly.

C. Project close-out conference shall be held during the final phases of the Work.

D. Engineer may schedule additional meetings.

E. Meetings scheduled by the Engineer shall be held at the offices of the North Carolina Department of Transportation in Raleigh, NC.

F. Contractor's project superintendent shall attend meetings.

G. Notify suppliers and subcontractors to attend meetings as appropriate or as required by Engineer.

H. Contractor shall schedule pre-installation conferences as required in the individual specification sections.

I. Notify Engineer of project meetings scheduled by the Contractor.

J. Engineer will schedule and administer meetings throughout the progress of the Work, except for meetings held by the Contractor for normal coordination of the Work.

K. Meeting agenda shall include, but not be limited to, the following: Project Administration, Submittals, Construction Schedules and Methods, Safety and Health Regulations, Project Coordination, Payment Application, Change Orders, and Site Inspections.

L. Engineer will prepare agenda with copies to participants, preside at meetings, prepare minutes and distribute to participants for meetings scheduled by the Engineer.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

NOT USED

END OF SECTION

SECTION 01330

SUBMITTAL PROCEDURES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. This Section includes, but is not limited to, requirements for the following:
   1. Submittal procedures.
   2. Construction progress schedule.
   3. Schedule of values.
   4. Proposed product list.
   5. Project record documents.
   6. Certificates of compliance.
   7. Catalog data.
   8. Shop drawings.
   9. Manufacturer's installation procedures.
   10. Samples.
   11. Test reports.
   12. Operation and maintenance instructions.
   13. Warranties.
   14. Spare parts and maintenance materials.

1.02 SUBMITTAL PROCEDURES

A. Transmit each submittal with cover letter to Engineer at The Wooten Company, 120 N. Boylan Avenue, Raleigh, NC 27603.

B. Sequentially number transmittal forms. Re-submittals to have original number with an alphabetic suffix.

C. Cover letter for each submittal package shall list the following:
   1. Contractors name:
   2. Owners name: North Carolina Department of Transportation
      Project name: I-95 Water Main Extension and Replacement
   3. Wooten Job No.: 3253-B

D. Individual submittals shall each be listed by the following information:
   1. Submittal reference no.
   2. Specification section number.
   3. Drawing and detail number when appropriate.
   4. Equipment.
   5. Type submittal.
   6. Supplier.
   7. Manufacturer.

E. Apply Contractor's stamp to each submittal, signed or initialed and dated, certifying that Contractor has reviewed submittal for conformance with requirements of Contract Documents, and has coordinated submittal with related work.

F. Schedule submittals to expedite Project, and deliver to coordinate submission of related items. Allow a minimum of fifteen (15) working days for Engineer's review.

G. Identify variations from Contract Documents and Product limitations as they relate to the satisfactory performance of the Project.

H. Provide space for Contractor and Engineer review stamps.

I. Revise and resubmit submittals as required; identify changes made since previous submittal.

J. Distribute copies of reviewed submittals to concerned parties. Instruct parties to promptly report inability to comply with provisions.

K. Work requiring submittal review by Engineer shall not be started until review has been obtained.

L. Engineer's review of submittals shall not relieve Contractor of responsibility for complete compliance with Contract Documents.

1.03 ADMINISTRATIVE SUBMITTALS

A. Construction Progress Schedule
   1. Submit five (5) copies of the initial progress schedule 15 days after date of Owner-Contractor Agreement. One copy shall be returned to the Contractor.
   2. Progress schedule shall be, as a minimum, a horizontal bar chart with a separate line for each major section of Work. Identify the first work day of each week.
   3. Show complete sequence of construction by activity, identifying Work of separate stages and other logically grouped activities. Indicate the early and late start, early and late finish, float dates, and duration.
   4. Indicate the expected monthly pay requests.
   5. Submit revised schedule with each Application for Payment as required for updating, identifying changes since previous version. Indicate estimated percentage of completion for each item of Work at each submission.
   6. Indicate submittal dates required for critical shop drawings, product data, samples, and product delivery dates .
   7. Indicate specific work sequences and requirements as indicated in Section, Summary of Work.

B. Schedule of Values
   1. Submit three (3) copies of the schedule of values at least three (3) weeks prior to the first partial payment request. Schedule shall divide the lump sum contract items into major work tasks. Use the table of contents as a guide for itemizing the schedule. Schedule will be used only as a basis for review of the Contractor's request for payment.
   2. Engineer may request additional delineation of work tasks and supporting data of the values, as he deems appropriate. Revise schedule and resubmit.
   3. Revise schedule to list approved Change Orders, with each request for payment.

C. Project Record Documents
   1. Maintain on site, one set of the following record documents; record actual revisions to the Work:
      a. Contract Drawings.
      b. Project Manual.
      c. Addenda.
      d. Change Orders and other Modifications to the Contract.
      e. Reviewed submittals.

2. Store Record Documents separate from documents used for construction.
3. Record information concurrent with construction progress.
4. Specifications: Legibly mark and record at each Product section description of actual Products installed, including the following:
    a. Manufacturer's name and product model and number.
    b. Product substitutions or alternates utilized.
    c. Changes made by Addenda and Modifications.
5. Record Documents and Shop Drawings: Legibly mark each item to record actual construction including:
    a. Measure elevations of structures in relation to bench mark datum.
    b. Measure and reference horizontal and vertical locations of underground utilities and appurtenances to existing permanent surface improvements that are indicated on the Drawings.
    c. Field changes from construction Drawings.
    d. Details not on original Contract Drawings.
6. Submit documents to Engineer with final Application for Payment.

1.04 TECHNICAL SUBMITTALS

A. General
1. Submit the following as required by the individual sections of the technical specifications.
2. Unless noted otherwise, submit the number of copies that Contractor requires, plus three (3) copies that will be retained by Engineer.

B. Certificates of Compliance
1. Certificates shall certify that the Products delivered to the project are in conformance with the specifications.
2. Certificates may be recent or previous test results on Product, but must be acceptable to Engineer.
3. Certification shall not relieve the Contractor of responsibility for complying with requirements of the specifications.

C. Catalog Data
1. When shop drawings are not required, the catalog data shall include the following as a minimum:
    a. Parts schedule that identifies the materials to be used in each of the various parts.
    b. Sufficient detail to serve as a guide for assembly and disassembly of the product and to serve as guide for ordering parts.
2. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information unique to this Work in the Shop Drawing submittal.

D. Shop Drawing
1. Shop drawings shall consist of drawings, diagrams, illustrations, schedules, performance charts, brochures and other data, prepared specifically for a portion of the Work.
2. Shop drawings shall indicate the type, size, quantity, arrangement, location, mode of operation, component materials, utility connections, wiring and control diagrams, anchorage's, supports, factory applied coatings, and other information necessary to ensure satisfactory fabrication, installation and operation of the completed Work.

3. Shop drawings shall establish the actual detail of manufactured or fabricated items, indicate proper relation to adjoining work, amplify design details of mechanical and electrical equipment in proper relation to physical spaces in the structure, and incorporate minor changes to design and construction to suit actual requirements.

E. Manufacturer's Installation Procedures
   1. Installation procedures should indicate manufacturer’s recommendations for proper installation of Product.

F. Samples
   1. Submit samples as required by the individual specification sections. Samples shall be physical examples to illustrate the materials and workmanship. Submit in sufficient size and quantity to clearly illustrate the functional characteristics of the Product, with integrally related parts and attachment devices, and the full range of color to be provided.

G. Test and Start-Up Reports
   1. Submit three (3) copies of report to the Engineer within seven (7) days of performing the test.
   2. Report shall include the following as a minimum:
      a. Owners name: North Carolina Department of Transportation
         Project name: I-95 Water Main Extension and Replacement
         Wooten job number: 3253-B
      b. Firm performing work.
      c. Individual performing work.
      d. Specification section no.:
      e. Product tested or started.
      f. Date and time of work.
      g. Type of test or start-up.
      h. Specific location in the Project: (i.e. Structure name and location within the structure by a rough sketch.)
      i. Results.
      j. Opinion of firm doing the work as to the test or start-up being in compliance with the Contract Documents.
   3. When requested by Engineer, the testing or start-up firm shall provide additional interpretation of results.

H. Operation and Maintenance Instructions
   1. Submit three (3) copies of operation and maintenance instructions within 45 days after approval of the shop drawings.
   2. Submit instructions in a navy blue vinyl, loose leaf binder containing the name of the equipment covered on the front and the spine of the binder. Provide tab dividers appropriately labeled.
   3. As a minimum, the submittal shall contain complete operation and maintenance instructions, drawings, and complete parts list.
   4. In addition, for equipment requiring periodic lubrication, provide two (2) lubrication charts; one shall be included in the binder, and the other shall be provided in weatherproof 10 mil. laminated plastic and shall be permanently affixed to the equipment. Charts shall contain pertinent information concerning the lubricating requirements including manufacturer's name, name of equipment, recommended service interval, and recommended lubricant, location of each of the points of lubrication.

I. Warranties
   1. Provide duplicate notarized copies.
   2. Assemble documents from Subcontractors, suppliers, and manufacturers.
   3. Provide Table of Contents and assemble in three D side ring binder with durable plastic cover.
   4. Submit prior to final Application for Payment.
   5. For items of Work delayed beyond date of Substantial Completion, provide updated submittal within 10 days after acceptance, listing date of acceptance as start of warranty period.

J. Spare Parts and Maintenance Materials
   1. Provide products, spare parts, maintenance, and extra materials in quantities specified in individual specification Sections.
   2. Deliver to Project site and place in location as directed by the Owner. Obtain Owner's signature and date bill of materials as delivered to the site as required by this paragraph. Provide a copy of signed bill of materials to Engineer with request for payment.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

END OF SECTION

SECTION 01450

QUALITY CONTROL

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Quality assurance and control of installation.

B. Inspection and testing laboratory services.

1.02 QUALITY ASSURANCE/CONTROL OF INSTALLATION

A. Manufacturer shall have the minimum number of years of proven successful experience required in each section in the design, manufacture, and servicing of Products specified.

B. In lieu of the required experience, manufacturer may provide a cash deposit or bond equal to the cost of the Product, but pro-rated to the number of years of actual experience.

C. Products from a manufacturer who does not meet the experience requirements must meet technical requirements.

D. Monitor quality control over suppliers, manufacturers, Products, services, site conditions, and workmanship, to produce Work of specified quality.

E. Comply fully with manufacturers' instructions, including each step in sequence.

F. Should manufacturers' instructions conflict with Contract Documents, request clarification from Engineer before proceeding.

G. Comply with specified standards as a minimum quality for the Work except when more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.

H. Perform work by persons qualified to produce workmanship of specified quality.

I. Secure Products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, or disfigurement.

1.03 INSPECTION AND TESTING LABORATORY SERVICES

A. Provide the services of an independent firm to perform soil and material inspections, testing and other services specified in the individual specification sections of this Contract Document.

B. Testing laboratory shall be authorized to operate in the state in which Project is located.

C. Testing laboratory shall have a full-time registered Engineer on staff to review services.

D. Testing equipment shall be calibrated at reasonable intervals with devices of an accuracy traceable to either National Bureau of Standards (NBS) standards or accepted values of natural physical constants.

E. Prior to start of Work, submit testing laboratory name, address, and telephone number, names of full-time registered engineer, field inspector, and responsible project manager. Laboratory subject to the approval of the Engineer.

F. The same independent firm shall perform retesting. Contractor shall pay for retesting required by the failure of the initial test to meet the requirements of the specifications.

1.04 LABORATORY RESPONSIBILITIES

A. Testing Laboratory shall have the following responsibilities for the Project:
   1. Attend pre-construction conferences and progress meetings as required by the Engineer.
   2. Collect and test samples of mixes.
   3. Provide qualified personnel at site. Cooperate with Engineer and Contractor in performance of services.
   4. Perform inspection, sampling, and testing in accordance with Contract Documents and specified standards.
   5. Ascertain compliance of soil compaction and material mixes with requirements of Contract Documents.
   6. Promptly notify Engineer and Contractor of observed irregularities or nonconformance of Work or Products.
   7. Perform additional inspections and tests required by Engineer when specified tests have failed.

1.05 LIMITS ON TESTING LABORATORY AUTHORITY

A. The authority of the Testing Laboratory is limited as follows:
   1. May not alter requirements of Contract Documents.
   2. May not approve or accept any portion of the Work.
   3. May not assume duties of Contractor.
   4. Has no authority to stop the Work.

1.06 LABORATORY REPORTS

A. After each inspection and test, the independent testing firm shall submit report(s) as specified in Section, Submittal Procedures.

1.07 CONTRACTOR RESPONSIBILITIES

A. Unless specified otherwise, deliver to laboratory at designated location, adequate samples of materials proposed to be used that require testing. The proposed mix designs shall be included with delivery.

B. Cooperate with laboratory personnel, and provide access to the Work and to manufacturer's facilities as specified.

C. Provide incidental labor and facilities to provide access to Work to be tested, to obtain and handle samples at the site and at source of products to be tested, to facilitate tests and inspections, storage, and curing of test samples.

D. Notify Engineer and laboratory 24 hours prior to expected time for operations requiring inspection and testing services.

PART 2 PRODUCTS NOT USED

PART 3 EXECUTION NOT USED

END OF SECTION

SECTION 01500

TEMPORARY FACILITIES AND CONTROLS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Temporary Utilities: Electricity, lighting, telephone service, water, and sanitary facilities.

B. Work on public right-of-way.

C. Traffic control.

D. Temporary Controls: Barriers, enclosures and fencing, water control, dust control, erosion and sediment control, and protection of the work.

E. Construction Facilities: Access roads, parking, and progress cleaning.

1.02 TEMPORARY UTILITIES

A. Electricity
   1. Provide and pay for required power service for construction from Utility source.

B. Lighting
   1. Provide and maintain lighting for construction operations as required by Contractor.
   2. Provide and maintain lighting to exterior staging and storage areas after dark for security purposes as required by Contractor.

C. Water
   1. Provide, maintain, and pay for suitable quality water, including any necessary service(s) required for construction operations. Exercise measures to conserve water during construction.

D. Sanitary Facilities
   1. Provide and maintain required facilities and enclosures as necessary to comply with the laws and ordinances of the authority having jurisdiction and the State of North Carolina.
   2. General Contractor shall provide the above sanitary facilities for all contractors, sub-contractors, Owner and Engineer at the Project Site.
   3. Existing facilities shall not be used.

1.03 WORK ON PUBLIC RIGHTS-OF-WAY/PRIVATE PROPERTY

A. Work on this Project is along rights-of-way and/or property under jurisdiction of the following:

N.C. Department of Transportation (NCDOT):
Work in Nash County:
Division 4, District 2

B. Prior to start of Work notify the Office of the N.C. Department of Transportation.

C. Work shall conform to the requirements and be subject to the approval of the above agency(ies).

D. Contractor shall be responsible to the Owner for the cost of all inspection that is billed to the Owner by the N.C. DOT. Cost shall be deducted from the Contractor's pay request.

E. Submit letter to the above District Engineer(s) when work is complete.

F. Submit letter of approval for completed Work from the above agency(ies) with Final Payment Request.

G. Clean rights-of-way as work progresses and daily.

H. Power broom existing pavement as work progresses.

I. Work shall be in accordance with the latest edition of the N.C. Division of Highways, "Policies and Procedures for Accommodating Utilities on Highway Right-of -Way."

J. Consult with the above agency(ies) in establishing public thoroughfares to be used for haul routes and site access.

K. Confine construction traffic to designated haul routes.

L. Provide traffic control along haul routes to regulate traffic and to minimize interference with public.

M. Provide and maintain access to fire hydrants, free of obstructions.

1.04 TRAFFIC CONTROL

A. On public and private road rights-of-way provide traffic control devices when construction encroaches within the right-of-way. Devices shall include, but not be limited to, cones, drums, flares, warning signs, temporary pavement marking, warning lights, and flagman.

B. Traffic control devices shall provide the following:
   1. Protection of motorists, pedestrians and workers from accident hazards.
   2. Advance public information of proposed work sites.
   3. Establishment of an orderly and safe flow of traffic and to minimize traffic congestion.
   4. Provision of access for emergency vehicles.

C. Traffic control devices shall be used in accordance with the latest edition of the NC DOT "Manual on Uniform Traffic Control Devices for Streets and Highways (MUTCD)."

D. Provide personnel trained in traffic control.

1.05 TEMPORARY CONTROLS

A. General
   1. Temporary controls shall be the responsibility of each Contractor for their respective work unless noted otherwise.

B. Barriers
   1. Provide barriers to prevent unauthorized entry to construction areas for the safety of the public, the protection of the work, and to protect existing facilities and adjacent properties from damage from construction operations.
   2. Provide barricades required by agency in 1.4.A for public rights-of-way and for public access to existing buildings.
   3. Provide protection for plant life designated to remain. Replace damaged plant life.
   4. Protect vehicular traffic, stored materials, site, and structures from damage.

C. Water Control
   1. Grade site to drain. Provide, operate, and maintain pumping equipment to maintain excavations free of water.
   2. Protect site from running water.

D. Dust Control
   1. Execute Work by methods designed to minimize raising dust from construction operations.
   2. Provide positive means to prevent airborne dust from dispersing into atmosphere.

E. Erosion and Sediment Control
   1. Provide Erosion and Sediment Control as indicated on the Drawings and specified in Section 02370, Erosion Control.

F. Protection of Installed Work
   1. Protect installed Work and provide special protection where specified in individual specification Sections.
   2. Provide temporary and removable protection for installed Products. Control activity in immediate work area to minimize damage.
   3. Prohibit traffic from landscaped areas.

1.06 CONSTRUCTION FACILITIES

A. General
   1. Construction facilities shall be the responsibility of each Contractor for their respective work unless noted otherwise.

B. Access Roads
   1. Contractor shall construct and maintain temporary drives as necessary to access public thoroughfares and existing drives to serve the construction area.
   2. Provide means of removing mud from vehicle wheels before entering streets.

C. Parking
   1. When site space is not adequate, arrange for temporary off site surface parking areas to accommodate construction personnel.
   2. Do not allow vehicle parking in existing right-of-way or to block existing drives.
   3. Do not allow vehicle parking on private property without prior approval.

D. Progress Cleaning
   1. Maintain areas free of waste materials, debris, and rubbish. Maintain site in a clean and orderly condition.
   2. Remove waste materials, debris, and rubbish from site periodically and dispose off site.

1.07 REMOVAL OF UTILITIES, FACILITIES, AND CONTROLS

A. Remove temporary above grade or buried utilities, equipment, facilities, and materials, prior to Final Inspection.

B. Clean and repair damage caused by installation or use of temporary work.

C. Restore existing facilities used during construction to original condition. Restore permanent facilities used during construction to specified condition.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

END OF SECTION

SECTION 01600

PRODUCT REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Products.

B. Transportation and handling.

C. Storage and protection.

D. Product options.

E. Substitutions.

1.02 PRODUCTS

A. Products: Means new material, machinery, components, equipment, fixtures, and systems forming the Work. Does not include machinery and equipment used for preparation, fabrication, conveying, and erection of the Work. Products may also include existing materials or components specified in the Contract Documents for reuse.

1.03 TRANSPORTATION AND HANDLING

A. Transport and handle Products in accordance with manufacturer's instructions.

B. Ship fabricated assemblies in largest sections permitted by carrier regulations and properly marked for ease of field erection.

C. Promptly inspect shipments to assure that Products comply with specified requirements, quantities are correct, and Products are undamaged.

D. Provide equipment and personnel to handle Products by methods to prevent soiling, disfigurement, or damage.

1.04 STORAGE AND PROTECTION

A. Keep on site storage of material to a minimum.

B. Store and protect Products in accordance with manufacturer's instructions in unopened original packages, with seals and labels intact and legible. Store sensitive Products in weather-tight, climate-controlled enclosures.

C. For exterior storage of fabricated Products, place on sloped supports, above ground.

D. Provide off site storage and protection when site does not permit on site storage.

E. Cover Products subject to deterioration with impervious sheet covering. Provide ventilation to avoid condensation.

F. Store loose granular Products on solid flat surfaces in a well drained area. Prevent mixing with foreign matter.

G. Arrange storage of Products to permit access for inspection. Periodically inspect to assure Products are maintained under specified conditions.

1.05 DAMAGED PRODUCTS

A. Remove damaged Products from Project site.

1.06 PRODUCT OPTIONS

A. Products Specified by Reference Standards: Product meeting standard and specific requirements of these specifications.

B. Products Specified by Naming One or More Manufacturers: Products of manufacturers named and meeting specifications, no options or substitutions allowed.

C. Products Specified by Naming Three Manufacturers with an "or equal" Provision for Substitutions: Submit a request for substitution for manufacturer not named during the shop drawing submittal.

1.07 SUBSTITUTIONS

A. Engineer will consider requests for Substitutions only within 30 days after date of Owner-Contractor Agreement.

B. Substitutions may be considered when a product becomes unavailable through no fault of the Contractor.

C. Document each request with complete data substantiating compliance of proposed Substitution with Contract Documents.

D. Request constitutes a representation that Contractor:
   1. Has investigated proposed product and determined that it meets or exceeds the quality level of the specified product.
   2. Shall provide same warranty for Substitution as for specified product.
   3. Shall coordinate installation and make changes to other Work which may be required for the Work to be complete with no additional cost to Owner.
   4. Waives claims for additional costs or time extension that may subsequently become apparent.
   5. Shall reimburse Owner for review or redesign services associated with reapproval by authorities.

E. Substitutions will not be considered when they are indicated or implied on shop drawing or product data submittals, without separate written request, or when acceptance will require revision to the Contract Documents.

F. Substitution Submittal Procedure:
   1. Submit three copies of request for Substitution for consideration. Limit each request to one proposed Substitution.
   2. Submit shop drawings, product data, and certified test results attesting to proposed product equivalence.
   3. Engineer will notify Contractor, in writing, of decision to accept or reject request.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 01700

EXECUTION REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Examination.

B. Cutting and patching.

C. General installation provisions.

D. Cleaning and protection.

E. Final inspection and tests.

F. Adjusting.

G. Close-out procedures.

1.02 EXAMINATION

A. Verify that existing site conditions and substrate surfaces are acceptable for subsequent Work. Beginning new Work means acceptance of existing conditions.

B. Verify that existing substrate is capable of structural support or attachment of new Work being applied or attached.

C. Examine and verify specific conditions described in individual specifications sections.

D. Verify that utility services are available, of the correct characteristics, and in the correct locations.

1.03 CUTTING AND PATCHING

A. General
   1. Do not cut, or alter the work of other contractors without written approval of the Engineer.
   2. Work removed shall be replaced or repaired by the Contractor who removed or damaged the work, and a craftsman, skilled in the trade that the particular replacement requires, shall do the work. (i.e.: A mason, not an electrician, shall replace masonry removed by the Electrical Contractor.)
   3. Conduct removal operations in a manner that will eliminate hazards to persons and property and prevent the release of dust and rubbish into the air. Existing work, which is to remain and is damaged by contract operations shall be replaced with new materials at no additional cost to the Owner.
   4. For replacement of work removed, comply with specifications for type of work to be done.

B. Inspection
   1. Inspect existing conditions of work including elements subject to movement or damage during cutting and patching, and excavating and backfilling.
   2. After uncovering work, inspect conditions affecting installation of new products.

C. Preparation prior to cutting
   1. Provide shoring, bracing, and support as required to maintain structural integrity of project.

2. Provide protection for other portions of project.
3. Provide protection from elements.

D. Performance
1. Execute fitting and adjustment of products to provide finished installation to comply with specified tolerances, finishes.
2. Execute cutting and demolition by methods to prevent damage to other work and provide proper surfaces to receive installation of repairs and new work.
3. Execute excavating and backfilling as specified in Section, Trenching for Utilities.
4. Restore work, which has been cut or removed; install new products to provide completed work in accordance with requirements of contract documents.
5. Refinish entire surfaces as necessary to provide an even finish.
a. Continuous Surfaces: To nearest intersections.
b. Assembly: Entire Refinishing.

1.04 GENERAL INSTALLATION PROVISIONS

A. Require Installer of each major component to inspect conditions under which Work is to be performed. Clean substrate surfaces prior to applying next material or substance. Do not proceed until unsatisfactory conditions have been corrected.

B. Comply with manufacturer's recommendations to the extent that they are more explicit or stringent than requirements contained in Contract Documents.

C. Provide attachment and connection devices and methods necessary for securing Work. Secure Work true to line and level. Allow for expansion and building movement.

D. Provide uniform joint widths in exposed Work. Arrange joints in exposed Work to obtain the best visual effect. Refer questionable choices to the Engineer for final decision.

E. Check dimensions before starting each installation.

F. Install each component during weather conditions and Project status that will ensure the best possible results. Isolate each part of the completed construction from incompatible material as necessary to prevent deterioration.

G. Coordinate temporary enclosures with required inspections and tests, to minimize the necessity of uncovering completed construction for that purpose.

H. Where mounting heights are not indicated, install individual components at standard mounting heights recognized within the industry for the particular application indicated. Refer questionable mounting height decisions to the Engineer for final decision.

1.05 CLEANING AND PROTECTION

A. During handling and installation, clean and protect construction in progress and adjoining materials in place. Apply protective covering where required to ensure protection from damage or deterioration.

B. Clean and maintain completed construction as frequently as necessary through the construction period. Adjust and lubricate components as required to ensure proper operation.

C. Limiting Exposures: Supervise construction activities to ensure that no part of the construction, completed or in progress, is subject to harmful, or dangerous exposure

during the construction period. Where applicable, such exposures include, but are not limited to, the following:

1. Excessive static or dynamic loading.
2. Excessive internal or external pressures.
3. Excessively high or low temperatures.
4. Thermal shock.
5. Air contamination or pollution.
6. Water or ice.
7. Abrasion.
8. Heavy traffic.
9. Misalignment.
10. Improper shipping or handling.
11. Theft.
12. Vandalism.

D. Clean Project prior to final inspection. Project clean up shall include, but not be limited to, the following:

1. Clean surfaces exposed to view as recommended by manufacturer.
2. Remove temporary labels.
3. Repaint damaged paint surfaces.
4. Clean debris from drainage systems.
5. Sweep paved areas.
6. Rake clean landscaped surfaces.
7. Remove waste and surplus materials.
8. Remove temporary construction facilities.

1.06 FINAL INSPECTION AND TESTS

A. Prior to final acceptance place equipment in operation and make necessary adjustments for proper operation. Test equipment under normal operating conditions in the presence of Engineer. Test shall show conclusively that requirements of the specifications have been fulfilled.

B. Complete punch list items within 30 days of receipt from Engineer. Owner may have work not completed within 30 days performed by others with the cost deducted from Contractor’s final payment. Additional engineering and inspection services required as a result of Contractor not completing punch list within 30 days shall be at Contractor's expense.

1.07 ADJUSTING

A. Adjust operating Products and equipment to ensure smooth and unhindered operation.

B. Provide proper fluids in equipment.

C. Provide proper filters in equipment.

1.08 CLOSE-OUT PROCEDURES

A. Submit written certification that Contract Documents have been reviewed, Work has been inspected, and is complete in accordance with Contract Documents and ready for Engineer's inspection.

B. Provide submittals to Engineer that are required by governing or other authorities.

C. Submit set of Record Documents indicating changes during construction as required in Section, Submittal Procedures.

D. Submit final Application for Payment identifying total adjusted Contract Sum, previous payments, and final amount due.

E. Submit the following with final Application for Payment:
   1. Affidavit of Release of Liens
   2. Consent of Surety for Final Payment
   3. Affidavit of Payment of Debts and Claims
   4. Final Certified Payroll Information

F. Submit warranties as required by individual equipment specifications.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

END OF SECTION

SECTION 02230

CLEARING AND GRUBBING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Work shall include, but not be limited, to the following:
   1. Clearing and grubbing.
   2. Removal of surface debris.
   3. Demolition and removal of existing paving and structures.
   4. Temporary and permanent ground cover.

1.02 RELATED SECTIONS

A. The following Sections have work that is directly related to this Section. This does not relieve the Contractor of his responsibility of proper coordination of all the work:
   1. Section 02370 Erosion Control
   2. Section 02920 Lawns and Grasses.

1.03 WARRANTY AND FINES

A. Contractor is liable for damages to public and private property and fines as may be placed on the Project by the governing agencies due to failure to provide adequate erosion control devices.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

3.01 PROTECTION

A. Take reasonable care during construction to avoid damage to vegetation outside of clearing limits.

B. Locate and protect property corners and survey control stakes prior to start of clearing operations.

C. Provide temporary gates and fences as necessary to prevent unauthorized vehicular access to the site.

D. Mark clearing limits.

E. Refer to paragraph 4.04 of the General Conditions and 4.04.A.2 of the Supplementary Conditions concerning the protection of Underground Facilities.

3.02 INSTALL EROSION CONTROL DEVICES

A. Clear areas required to install erosion control devices, which shall be in place and operational prior to other land disturbing activity. Install erosion control devices in accordance with Section, Erosion Control.

3.03 BORROW AND DISPOSAL AREAS

A. Obtain and pay for erosion control permit for borrow and disposal areas as required by Contractor.

B. Install and maintain erosion control devices in accordance with Contractor's approved plan.

3.04 CLEARING AND GRUBBING

A. Clear and grub vegetation within right-of-way as necessary to construct.

B. For open cut installation, clear and grub total width of permanent easement. Clear within temporary construction easement only as necessary for construction. Do not grub within the temporary construction easement. For horizontal directional drill installation, do not clear and grub beyond installation pits unless required to complete construction.

C. Clearing shall consist of cutting and removal of vegetation to the existing ground surface and removal of debris. Debris shall include, but not be limited to, fences, steps, walls, chimneys, footings, foundation slabs, basements, signs, junked vehicles, and other rubble.

D. Grubbing shall consist of the removal of roots over 3 inches in diameter, matted roots, stumps, and other vegetable matter to 12 inches below existing grade.

E. Do not precede grading operation by grubbing operation by more than seven days.

F. When the depth of embankment exceeds 6 feet, cut sound stumps off at the existing ground level and do not grub. Remove decayed stumps to a depth of approximately 2 feet below the existing grade.

G. Fill holes and depressions and bring cleared and grubbed area to a uniform contour to match existing grade. Provide positive drainage.

H. Remove and properly dispose of cleared and grubbed material from the site. Make reasonable effort to channel timber resulting from clearing operations into a beneficial use.

I. Burning shall not be permitted at the site.

END OF SECTION

SECTION 02315

TRENCHING FOR UTILITIES

PART 1 GENERAL

1.01 SCOPE

A. Provide labor, equipment, and material to perform required excavating, backfilling, and compacting for utilities and related structures as specified herein and indicated on the Drawings. Work shall include, but not be limited to, the following:
   1. Survey staking as required for construction.
   2. Protection of existing improvements.
   3. Location of installed utilities.
   4. Use of explosives.
   5. Dewatering.
   6. Excavating, backfilling, and compacting for utilities.
   7. Installation of electronic marker balls.
   8. Installation of warning / identification tape and tracer wire.
   9. Borrow material.
   10. Disposal of surplus material.

1.02 RELATED SECTIONS

A. The following Sections have work that is directly related to this Section. This does not relieve the Contractor of his responsibility of proper coordination of all the work:
   1. Section 02230 Clearing and Grubbing
   2. Section 02370 Erosion Control
   3. Section 02445 Bore & Jack
   4. Section 02447 Directional Drilling
   5. Section 02510 Water Distribution System
   6. Section 02920 Lawns and Grasses

1.03 REFERENCED STANDARDS

A. The latest revision, at the time of bidding, of the publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.
   1. N.C. Department of Transportation - Standard Specifications for Roads and Structures (NCDOT).
   2. American Society of Testing Materials (ASTM)
      a. D698 Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 5.5-lb (2.49 Kg) Rammer and 12-inch Drop (Standard Proctor).
      b. D1556 Density of Soil in Place by the Sand-Cone Method.
      c. D1586 Penetration Test and Spilt-Barrel Sampling of Soils.
      d. D2049 Test for Relative Density of Cohesionless Soils.
      e. D2216 Laboratory Determination of Water (Moisture) Content of Soil, Rock, and Soil-Aggregate Mixtures.
      f. D2487 Classification of Soils for Engineering Purposes.
   3. Uni-Bell PVC Pipe Association
      a. B-5-89 Recommended Practice for the Installation of Polyvinyl Chloride (PVC) Sewer Pipe.

1.04 DEFINITIONS

A. Backfill: A specified material used in filling the excavated trench and placed at a specified degree of compaction.
   1. Materials: Materials listed herein include processed materials plus the soil classifications listed under the Unified Soil Classification System, (USCS) (Method D2487 and Practice D2488). The soil materials are grouped into five broad categories according to their suitability for this application.
      a. Class I: Angular, 6 to 40-mm (1/4 to 1-1/2-in), graded stone, including a number of fill materials that have regional significance such as coral, slag, cinders, crushed stone, and crushed shell. For these purposes of these specifications, Class 1 materials shall be NCDOT #57 or #67 stone.
      b. Class II: Coarse sands and gravels with maximum particle size of 44 mm (1-1/2 in.), including various graded sands and gravels containing small percentages of fines, generally granular and noncohesive, either wet or dry. Soil Types GW, GP, SW, and SP are included in this class.
      c. Class III: Fine sand and clayey gravels, including fine sands, sand-clay mixtures, and gravel-clay mixtures. Soil Types GM, GC, SM, and SC are included in this class.
      d. Class IV: Silt, silty clays, and clays, including inorganic clays and silts of medium to high plasticity and liquid limits. Soil Types MH, ML, CH and CL are included in this class. These materials are not recommended for bedding, haunching, or initial backfill.
      e. Class V: This class includes the organic soils OL, OH, and PT as well as soils containing frozen earth, debris, rock larger than 40 mm (1 1/2 in.) in diameter, and other foreign materials. These materials are not recommended for bedding, haunching, or initial backfill.
   2. Backfill Zones: Each backfill zone shall extend the full width of the trench bottom.
      a. Foundation: Extending down from the bottom of bedding zone as defined below.
      b. Pipe Embedment
         1) Bedding: Extending from 4 inches below the pipe bottom to the pipe bottom for 30-inch diameter and smaller and 6 inches below the pipe for pipes larger than 30 inches in diameter.
         2) Haunching: Extending from the bedding (bottom of the pipe) to the pipe spring line.
         3) Initial Backfill: Extending from the haunching (pipe spring line) to 1 foot above the top of the pipe.
      c. Final Backfill: Extending from the initial backfill to the finish ground elevation.

B. Laying Conditions:
   1. Type 1: Flat bottom trench with loose backfill.
   2. Type 2: Flat bottom trench with backfill lightly consolidated to centerline of pipe.
   3. Type 3: Pipe bedded in 4 inches minimum of loose soil and backfill lightly consolidated to top of pipe.
   4. Type 4: Pipe bedded on Class I material to 1/8 pipe diameter (4 inch minimum) Backfill compacted to top of pipe a minimum of 80 percent of standard proctor.
   5. Type 5: Pipe bedded in compacted Class I material to pipe centerline with 4-inch minimum under pipe. Backfill to top of pipe with Class I, II, or III and compact to 90 percent of standard proctor.

C. Compaction: Process of mechanically stabilizing a material by increasing its density at a controlled moisture condition. "Degree of compaction" shall be expressed as a percentage of the maximum dry density obtained by the test procedure presented in ASTM D698 (Standard Proctor).

D. Excavation: The removal of soil or rock to obtain a specified depth or elevation.

E. Hard Material: Solid, homogeneous material which is not included in the definition of "rock" but which may require the use of heavy excavation equipment with ripper teeth. Amount must exceed 1 cubic yard in volume. Material having a standard penetration resistance as determined by ASTM D1586 between 60 and 150 blows per foot is defined as "hard material."

F. Lift: Layer of soil placed on top of a previously prepared or placed soil.

G. Rock: Solid, homogeneous material which cannot be removed without the systematic drilling and blasting exceeding 1 cubic yard in volume. Material having a standard penetration resistance as determined by ASTM D1586 greater than 150 blows per foot is defined as "rock." Removal of "hard material" will not be considered rock excavation because of intermittent drilling and blasting that is performed merely to increase production.

H. Pipe Springline: A line running horizontally through the center of the pipe.

I. Topsoil: Natural, friable soil, representative of productive soils in the vicinity of the site. Topsoil shall be free from roots, stones larger than 1 inch, objectionable weed seeds, toxic substances, and materials that hinder grading, planting, and maintenance operations.

1.05 SUBMITTALS

A. Submit the following in accordance with Section, Submittal Procedures:
   1. Catalog Data: Submit manufacturer's standard drawings or catalog cuts for the following. Clearly indicate equipment to be furnished for the Project including options to be provided.
      a. Warning / Identification tape.

PART 2 PRODUCTS

2.01 STONE

A. Class I material shall be #57 or #67 stone in accordance with NCDOT specifications Section 1005, General Requirements for Aggregate.

2.02 WARNING AND IDENTIFICATION TAPE

A. Tape shall be a minimum 3-inch wide polyethylene plastic tape manufactured specifically for identification of buried utilities with means of enabling detection by a metal detector to a depth of 18 inches below finished grade. Tape shall be color coded and continuously imprinted with warning and identification markings in bold black letters to read "CAUTION - BURIED (utility) LINE BELOW." Color and printing shall be permanent, unaffected by moisture or soil and shall be as follows:

Utility	Color	Marking
1. Water	Blue	Caution – Water Main Buried Below

B. Tape shall be by Blackburn Manufacturing, Joseph G. Pollard Co., or Reef Industries Inc.

2.03 TRACER WIRE

A. Tracer wire shall be #12 stranded copper wire. All connections shall be by wire nuts and taped.

B. Splices in tracer wire are to be kept to a minimum and joined with copper split nuts of appropriate size.

PART 3 EXECUTION

3.01 PROJECT SAFETY

A. Contractor is responsible for Project safety.

B. Perform work in conformance with applicable State and Federal safety regulations including, but not limited, to the following:
   1. North Carolina Safety and Health Standards for the Construction Industry (29CFR 1926 Subpart P).
   2. NC OSHA Industry Guide No. 14, Excavations.
   3. NC OSHA Industry Guide No. 20, Crane Safety.

C. Provide barriers, warning lights, and other protective devices at excavations as necessary for safety of workers and the public.

D. Provide sloping of bank, shoring, sheeting, or other means of maintaining the stability of the trench in accordance with the requirements of the Associated Contractor's Manual of Accident Prevention OSHA, Part 1926.P.

3.02 PROTECTION OF UNDERGROUND FACILITIES

A. Refer to paragraph 4.04 of the General Conditions and SC-4.04.A.2 of the Supplementary Conditions concerning the protection of Underground Facilities.

B. Approximate locations of existing underground facilities at the site are indicated on the Drawings based on information available to the Engineer. Engineer and Owner do not take responsibility for the accuracy of the information.

C. Investigate underground facility locations prior to the start of construction.

D. Repair damage to existing facilities at no additional cost to the Owner.

E. A change in conditions may be considered due to the location of the existing facilities as allowed in the General Conditions. This does not include the cost for repair of damaged facilities not properly located in advance of construction.

F. Separation distances shall be in accordance with utilities requirements.

3.03 CONSTRUCTION STAKING

A. Provide construction staking as indicated in paragraph 4.05 of the General Conditions. Engineer will only provide key reference points and benchmarks.

B. Provide construction staking. Owner will provide key reference points and benchmarks for construction, which in the Engineer’s judgment are necessary to enable Contractor to proceed with the Work. Contractor shall be responsible for laying out the Work as necessary for construction. Contractor shall protect and preserve the established reference points and property monuments.

C. Contractor shall report to Engineer whenever a reference point or property monument is lost or destroyed or requires relocation because of necessary changes

in grades or locations. Contractor shall be responsible for the accurate replacement or relocation of such reference points or property monuments by a registered professional surveyor in the State of North Carolina.

3.04 LOCATION OF INSTALLED UTILITIES

A. Contractor shall be responsible for locating contract installed utilities as requested by third parties proposing to dig in the contract area until the date that the entire contract is recommended for final payment by Engineer to Owner.

3.05 WATER CONTROL

A. Prevent surface water from entering the trench.

B. When trench bottom is below the existing ground water table, install a dewatering system to maintain water table 1 foot below trench bottom. Provide a man experienced in dewatering work at the job site.

C. Maintain dewatering until backfilling has proceeded above the existing ground water level.

D. Dispose of water from dewatering operations in accordance with the North Carolina Sedimentation Pollution Control Act.

3.06 USE OF EXPLOSIVES

A. Explosives may not be used on the Project.

3.07 EXCAVATING

A. Excavation shall be by open cut, unless otherwise indicated on the Drawings or specified herein. Short sections of trench may be tunneled or direct bored with the approval of the Engineer.

B. Stockpile excavated material in such a manner that it will not obstruct the flow of runoff, streams, endanger Work, impair the use or appearance of existing facilities, or be detrimental to the completed Work.

C. Contractor shall segregate excavated material so as to maintain material suitable for backfill separate from material that is unsuitable.

D. Trench dimensions at the pipe embedment and foundation zone unless noted otherwise shall be as follows:
   1. Minimum width: Pipe outside diameter plus 18 inches.
   2. Maximum width: Pipe outside diameter plus 24 inches.
   3. Sides shall be vertical to a minimum of one foot above the top of pipe.

E. Shape trench bedding to provide uniform bearing for the full pipe length. Bottom shall be free of protrusions that could cause point loading on pipe. Provide bell holes as required for properly making pipe joint.

F. Do not over excavate. Excavation below grade without approval of Engineer shall be backfilled with Class I material at no additional cost.

G. Undercut soils that become unsatisfactory by construction activity or by being left exposed to the weather and backfill with Class I material at no additional cost.

H. Remove shoring, bracing, and sheeting, unless otherwise noted, as the trench is backfilled. Engineer shall have the authority to require that the sheeting be left in place.

I. Excavation of trench shall not advance more than 200 feet ahead of the installation. In no case should the excavation extend beyond that which can be backfilled by the end of the workday.

J. Correct unstable soil conditions encountered at trench foundation by one of the following methods:
   1. Excavate below grade as approved by Engineer and backfill with Class I material or approved substitute material at unit price bid or the cost to be included in pipe unit bid price as indicated in Section, Unit Prices.

K. Rock and Hard Material
   1. Excavate rock and hard material to a minimum depth of 4 inches below the pipe for pipes smaller than 30 inches and 6 inches for pipes 30 inches and larger.

L. Pressure Lines:
   1. Provide a minimum 3 feet of cover, unless indicated otherwise on the Drawings.
   2. Excavate trenches to provide vertical curve chords that will not exceed the pipe manufacturer's recommended joint deflection.
   3. Provide concrete thrust blocks having a compressive strength of 3,000 psi at 28 days at change in horizontal and vertical direction and reduction in the pipe size, unless other restraint systems are indicated otherwise on the Drawings. Cut trench sides vertical and square to receive concrete. Provide bearing area against trench wall as indicated on the Drawings.

3.08 BACKFILLING

A. Weather Limitations: Proceed with backfill operations based on the following weather conditions:
   1. Temperature must be above freezing and rising.
   2. In windy, hot, or arid conditions with a high rate of evaporation add moisture to the material to maintain the optimum moisture content.
   3. Do not proceed in rain or on saturated subgrade.
   4. Do not place material on surfaces that are muddy, frozen, or contain frost.

B. General
   1. Maintain backfill operation within 200 feet from pipe laying operation.
   2. Backfill trench to existing ground surface with select excavated material at the specified compaction.
   3. If excavated material is unsuitable to obtain specified compaction, provide suitable off-site borrow material for backfill.
   4. Re-excavate trenches improperly compacted. Backfill and compact as specified.
   5. Provide appropriate tamping equipment, and water to obtain proper moisture content, to achieve specified compaction of backfill.
   6. Conduct operation of heavy equipment above pipe installation as to prevent damage to pipe.
   7. Install warning / identification tape over utilities. Bury tape one foot below finished grade above the utility.
   8. Install tracer wire for non-metallic pressure pipe. Bury tracer wire with pipe. Wire shall be looped into valve boxes to allow access for direct contact location.

C. Backfill in pipe embedment zone (bedding, haunching, and initial backfill).
   1. General:
      a. Backfill with material as specified below. Material shall be free from objects larger than 2 inches.

b. Where rock and hard material has been excavated below pipe bottom, backfill and compact bedding with Class I material. Class II or III material may be used for bedding with Engineer's approval.
c. Place backfill material to assure placement of material under pipe haunches.
d. Take care during placement and compacting of material to avoid movement of pipe.

2. Place backfill in bedding and haunching zones in 6 inch maximum lifts and compact to 90 percent density. Place initial backfill in one lift do not compact. Provide backfill material in pipe embedment zone as specified below.
   a. Pressure Lines (Flexible and Rigid Pipe)
      1) Excavation in Class I, Class II, Class III, and stable Class IV soils suitable for bedding, the bedding surface shall provide a firm foundation of uniform density. Backfill with select excavated material.
      2) Excavation in Class V, unstable Class IV soils, running water, and other unstable soil conditions, excavate a minimum of 4 inches below pipe bottom and provide Class I material for bedding and haunch zone. Backfill with Class I, II, or III material in initial backfill.

D. Final Backfill
1. Backfill with materials free of stones and debris larger than 6 inches in dimension. Place backfill in lifts not exceeding the thickness and compacted to the minimum density specified below.
2. Trench backfilled with noncohesive materials may be compacted with water flooding; except under roadways, shoulders of roadways, and other areas subject to vehicular movement, provided the method of compaction is approved by the Engineer and provides the degree of compaction required.
3. Lifts and density:
   a. Undeveloped areas (i.e., forests, fields, and, croplands): Trench may be filled with bulldozer blade provided material fall will not damage pipe. Mound soil over the trench area sufficiently to settle level over time. Degree of compaction shall be 85 percent.
   b. Lawns: Backfill in 12-inch lifts and compact to 90 percent. Top 12 inches shall be free of material with a dimension over 2 inches.
   c. Roads (including Rights-of-way), drives, parking areas (including areas within 20 feet), and adjacent to existing utilities: Backfill in 6 inch lifts compact to 95 percent.
   d. Within 20 feet of foundations: Backfill in 6-inch lifts compacted to 95 percent.

E. Utility Structures: Bring backfill to grade in even lifts on all sides. Lift depths and compaction densities shall be as specified according to area of installation for pipe above. Backfill against cast-in-place concrete structure only after concrete has attained the specified 28-day compressive strength.

3.09 ANTI-SEEP COLLARS

A. Anti-seep Collars: Provide anti-seep collars to prevent groundwater flow along pipe in wetlands as indicated on the Drawings. Use select clay material for collars. Collars shall extend past trench walls and bear against undisturbed soils. Dimension of collars shall be as indicated on the Drawings. Do not place stone in area of anti-seep collars.

B. Concrete Collar: Provide Class B concrete with minimum cement content of 5 sacks per cubic yard (5.5 sacks for angular course aggregate); 6.8 gallons of water per sack water-cement ratio; 2-4 inch slump range; and 28-day strength of 2,500 psi.

3.10 SOIL TESTING

A. Provide services of a soil-testing firm as specified in Section, Quality Control.

B. Testing laboratory soil specialist, as a minimum, shall be at the project site for the following:
   1. Provide a minimum of one (1) in-place density test for every 1,000 lf of trench.

C. Density tests shall be made in accordance with ASTM D-698, Standard Proctor Method.

D. Submit test reports and soil specialist daily logs in accordance with Section, Quality Control.

E. Based on test results, make corrections, adjustments, and modifications of methods, materials, and moisture content for proper trench compaction.

3.11 PAVEMENT PATCHING

A. Repair damaged pavement structure.

B. Cut existing pavement for utility installation in straight lines generally parallel to the utility. Properly dispose of removed pavement structure.

C. Extend pavement patch 1 foot beyond each side of trench on firm subgrade. Slope new surface to drain.

D. Asphalt Pavements: Replace asphalt pavement with a pavement structure equal to existing but no less than as detailed on the Drawings.

E. Concrete Pavements: Replace concrete pavement with pavement structure equal to existing but no less than as detailed as Drawings. Concrete shall be minimum 3,000 psi. When existing concrete joint is within 5 feet of trench remove existing concrete to joint. Provide expansion joint at edge of existing concrete. Surface treatment shall match existing.

F. Curbs, Gutters, and Sidewalks: Replace curbs and gutters, and sidewalks removed or damaged with similar sections to match the existing. Remove to nearest existing joint.

G. Approval of Other Authorities: Pavements under the jurisdiction of the NC Division of Highways shall be subject to the approval of a representative of that Division.

H. Raise existing and new manholes and valve boxes to finished pavement grade. Excavate around top of existing manhole and valve box as necessary. Remove existing top ring, and install new grade ring(s) as necessary. Install existing cover. Raise existing valve box. Provide concrete collar around manhole ring and valve box.

I. Pavement patching shall include the cost to adjust existing and new manhole and valve boxes to finished pavement elevations.

3.12 GRADING AND CLEAN-UP:

A. Provide for testing and clean up as soon as practicable, so these operations do not lag far behind the pipe installation. Perform preliminary clean up and grading as soon as backfill is complete.

B. Provide positive drainage of finished grade and drain away from structures. Finished grade shall be reasonably smooth, compacted, free from irregular surface changes and comparable to the adjacent existing ground surface.

C. Seed disturbed areas in accordance with Section, Lawns and Grasses.

D. Upon completion of backfilling, remove and properly dispose of excess material and waste.

END OF SECTION

Section 02370
Project Special Provisions
Erosion Control

STABILIZATION REQUIREMENTS:

(3-11-2016)

Stabilization for this project shall comply with the time frame guidelines as specified by the NCG-010000 general construction permit effective August 1, 2016 issued by the North Carolina Department of Environmental Quality Division of Water Resources. Temporary or permanent ground cover stabilization shall occur within 7 calendar days from the last land-disturbing activity, with the following exceptions in which temporary or permanent ground cover shall be provided in 14 calendar days from the last land-disturbing activity:

- Slopes between 2:1 and 3:1, with a slope length of 10 ft. or less
- Slopes 3:1 or flatter, with a slope of length of 50 ft. or less
- Slopes 4:1 or flatter

The stabilization timeframe for High Quality Water (HQW) Zones shall be 7 calendar days with no exceptions for slope grades or lengths. High Quality Water Zones (HQW) Zones are defined by North Carolina Administrative Code 15A NCAC 04A.0105 (25). Temporary and permanent ground cover stabilization shall be achieved in accordance with the provisions in this contract and as directed.

SEEDING AND MULCHING: (East)

The kinds of seed and fertilizer, and the rates of application of seed, fertilizer, and limestone, shall be as stated below. During periods of overlapping dates, the kind of seed to be used shall be determined. All rates are in pounds per acre.

All Roadway Areas

March 1 - August 31		**September 1 - February 28**	
50#	Tall Fescue	50#	Tall Fescue
10#	Centipede	10#	Centipede
25#	Bermudagrass (hulled)	35#	Bermudagrass (unhulled)
500#	Fertilizer	500#	Fertilizer
4000#	Limestone	4000#	Limestone

Waste and Borrow Locations

March 1 – August 31		**September 1 - February 28**	
75#	Tall Fescue	75#	Tall Fescue
25#	Bermudagrass (hulled)	35#	Bermudagrass (unhulled)
500#	Fertilizer	500#	Fertilizer
4000#	Limestone	4000#	Limestone

Note: 50# of Bahiagrass may be substituted for either Centipede or Bermudagrass only upon Engineer's request.

Approved Tall Fescue Cultivars

06 Dust	Escalade	Justice	Serengeti
2nd Millennium	Essential	Kalahari	Shelby
3rd Millennium	Evergreen 2	Kitty Hawk 2000	Sheridan
Apache III	Falcon IV	Legitimate	Signia
Avenger	Falcon NG	Lexington	Silver Hawk
Barlexas	Falcon V	LSD	Sliverstar
Barlexas II	Faith	Magellan	Shenandoah Elite
Bar Fa	Fat Cat	Matador	Sidewinder
Barrera	Festnova	Millennium SRP	Skyline
Barrington	Fidelity	Monet	Solara
Barrobusto	Finelawn Elite	Mustang 4	Southern Choice II
Barvado	Finelawn Xpress	Ninja 2	Speedway
Biltmore	Finesse II	Ol' Glory	Spyder LS
Bingo	Firebird	Olympic Gold	Sunset Gold
Bizem	Firecracker LS	Padre	Taccoa
Blackwatch	Firenza	Patagonia	Tanzania
Blade Runner II	Five Point	Pedigree	Trio
Bonsai	Focus	Picasso	Tahoe II
Braveheart	Forte	Piedmont	Talladega
Bravo	Garrison	Plantation	Tarheel
Bullseye	Gazelle II	Proseeds 5301	Terrano
Cannavaro	Gold Medallion	Prospect	Titan ltd
Catalyst	Grande 3	Pure Gold	Titanium LS
Cayenne	Greenbrooks	Quest	Tracer
Cessane Rz	Greenkeeper	Raptor II	Traverse SRP
Chipper	Gremlin	Rebel Exeda	Tulsa Time
Cochise IV	Greystone	Rebel Sentry	Turbo
Constitution	Guardian 21	Rebel IV	Turbo RZ
Corgi	Guardian 41	Regiment II	Tuxedo RZ
Corona	Hemi	Regenerate	Ultimate
Coyote	Honky Tonk	Rendition	Venture
Darlington	Hot Rod	Rhambler 2 SRP	Umbrella
Davinci	Hunter	Rembrandt	Van Gogh
Desire	Inferno	Reunion	Watchdog
Dominion	Innovator	Riverside	Wolfpack II
Dynamic	Integrity	RNP	Xtremegreen
Dynasty	Jaguar 3	Rocket	
Endeavor	Jamboree	Scorpion	

On cut and fill slopes 2:1 or steeper Centipede shall be applied at the rate of 5 pounds per acre and add 20# of Sericea Lespedeza from January 1 - December 31.

Fertilizer shall be 10-20-20 analysis. A different analysis of fertilizer may be used provided the 1-2-2 ratio is maintained and the rate of application adjusted to provide the same amount of plant food as a 10-20-20 analysis and as directed.

All areas seeded and mulched shall be tacked with asphalt. Crimping of straw in lieu of asphalt tack shall not be allowed on this project.

CRIMPING STRAW MULCH:

Crimping shall be required on this project adjacent to any section of roadway where traffic is to be maintained or allowed during construction. In areas within six feet of the edge of pavement, straw is to be applied and then crimped. After the crimping operation is complete, an additional application of straw shall be applied and immediately tacked with a sufficient amount of undiluted emulsified asphalt.

Straw mulch shall be of sufficient length and quality to withstand the crimping operation.

Crimping equipment including power source shall be subject to the approval of the Engineer providing that maximum spacing of crimper blades shall not exceed 8".

TEMPORARY SEEDING:

Fertilizer shall be the same analysis as specified for *Seeding and Mulching* and applied at the rate of 400 pounds and seeded at the rate of 50 pounds per acre. Sweet Sudan Grass, German Millet or Browntop Millet shall be used in summer months and Rye Grain during the remainder of the year. The Engineer will determine the exact dates for using each kind of seed.

FERTILIZER TOPDRESSING:

Fertilizer used for topdressing on all roadway areas except slopes 2:1 and steeper shall be 10-20-20 grade and shall be applied at the rate of 500 pounds per acre. A different analysis of fertilizer may be used provided the 1-2-2 ratio is maintained and the rate of application adjusted to provide the same amount of plant food as 10-20-20 analysis and as directed.

Fertilizer used for topdressing on slopes 2:1 and steeper and waste and borrow areas shall be 16-8-8 grade and shall be applied at the rate of 500 pounds per acre. A different analysis of fertilizer may be used provided the 2-1-1 ratio is maintained and the rate of application adjusted to provide the same amount of plant food as 16-8-8 analysis and as directed.

SUPPLEMENTAL SEEDING:

The kinds of seed and proportions shall be the same as specified for *Seeding and Mulching*, with the exception that no centipede seed will be used in the seed mix for supplemental seeding. The

rate of application for supplemental seeding may vary from 25# to 75# per acre. The actual rate per acre will be determined prior to the time of topdressing and the Contractor will be notified in writing of the rate per acre, total quantity needed, and areas on which to apply the supplemental seed. Minimum tillage equipment, consisting of a sod seeder shall be used for incorporating seed into the soil as to prevent disturbance of existing vegetation. A clodbuster (ball and chain) may be used where degree of slope prevents the use of a sod seeder.

MOWING:

The minimum mowing height on this project shall be 4 inches.

LAWN TYPE APPEARANCE:

All areas adjacent to lawns must be hand finished as directed to give a lawn type appearance. Remove all trash, debris, and stones ¾" and larger in diameter or other obstructions that could interfere with providing a smooth lawn type appearance. These areas shall be reseeded to match their original vegetative conditions, unless directed otherwise by the Field Operations Engineer.

MINIMIZE REMOVAL OF VEGETATION:

The Contractor shall minimize removal of vegetation within project limits to the maximum extent practicable. Vegetation along stream banks and adjacent to other jurisdictional resources outside the construction limits shall only be removed upon approval of Engineer. No additional payment will be made for this minimization work.

STOCKPILE AREAS:

The Contractor shall install and maintain erosion control devices sufficient to contain sediment around any erodible material stockpile areas as directed.

ACCESS AND HAUL ROADS:

At the end of each working day, the Contractor shall install or re-establish temporary diversions or earth berms across access/haul roads to direct runoff into sediment devices. Silt fence sections that are temporarily removed shall be reinstalled across access/haul roads at the end of each working day.

WATTLE:

Description

Wattles are tubular products consisting of excelsior fibers encased in synthetic netting. Wattles are used on slopes or channels to intercept runoff and act as a velocity break. Wattles are to be placed at locations shown on the plans or as directed. Installation shall follow the detail provided in the plans and as directed. Work includes furnishing materials, installation of wattles, matting installation, and removing wattles.

Materials

Wattle shall meet the following specifications:

100% Curled Wood (Excelsior) Fibers	
Minimum Diameter	12 in.
Minimum Density	2.5 lb/ft^3 +/- 10%
Net Material	Synthetic
Net Openings	1 in. x 1 in.
Net Configuration	Totally Encased
Minimum Weight	20 lb. +/- 10% per 10 ft. length

Anchors: Stakes shall be used as anchors.

Wooden Stakes:

Provide hardwood stakes a minimum of 2-ft. long with a 2 in. x 2 in. nominal square cross section. One end of the stake must be sharpened or beveled to facilitate driving down into the underlying soil.

Matting shall meet the requirements of Article 1060-8 of the *Standard Specifications,* or shall meet specifications provided elsewhere in this contract.

Provide staples made of 0.125" diameter new steel wire formed into a *u* shape not less than 12" in length with a throat of 1" in width.

Construction Methods

Wattles shall be secured to the soil by wire staples approximately every 1 linear foot and at the end of each section of wattle. A minimum of 4 stakes shall be installed on the downstream side of the wattle with a maximum spacing of 2 linear feet along the wattle, and according to the detail. Install a minimum of 2 stakes on the upstream side of the wattle according to the detail provided in the plans. Stakes shall be driven into the ground a minimum of 10 in. with no more than 2 in. projecting from the top of the wattle. Drive stakes at an angle according to the detail provided in the plans.

Only install wattle(s) to a height in ditch so flow will not wash around wattle and scour ditch slopes and according to the detail provided in the plans and as directed. Overlap adjoining sections of wattles a minimum of 6 in.

Installation of matting shall be in accordance with the detail provided in the plans, and in accordance with Article 1631-3 of the *Standard Specifications*, or in accordance with specifications provided elsewhere in this contract.

The Contractor shall maintain the wattles until the project is accepted or until the wattles are removed, and shall remove and dispose of silt accumulations at the wattles when so directed in accordance with the requirements of Section 1630 of the *Standard Specifications*.

Measurement and Payment

Wattle will be measured and paid for by the actual number of linear feet of wattles which are installed and accepted. Such price and payment will be full compensation for all work covered by this section, including, but not limited to, furnishing all materials, labor, equipment and incidentals necessary to install the *Wattle*.

Matting will be measured and paid for in accordance with Article 1631-4 of the *Standard Specifications,* or in accordance with specifications provided elsewhere in this contract.

Payment will be made under:

Pay Item	**Pay Unit**
Wattle	Linear Foot

EROSION AND SEDIMENT CONTROL/STORMWATER CERTIFICATION:

(1-16-07) (Rev 11-22-16) 105-16, 225-2, 16 SP1 G180

General

Schedule and conduct construction activities in a manner that will minimize soil erosion and the resulting sedimentation and turbidity of surface waters. Comply with the requirements herein regardless of whether or not a National Pollution discharge Elimination System (NPDES) permit for the work is required.

Establish a chain of responsibility for operations and subcontractors' operations to ensure that the *Erosion and Sediment Control/Stormwater Pollution Prevention Plan* is implemented and maintained over the life of the contract.

(A) *Certified Supervisor* - Provide a certified Erosion and Sediment Control/Stormwater Supervisor to manage the Contractor and subcontractor operations, insure compliance with Federal, State and Local ordinances and regulations, and manage the Quality Control Program.

(B) *Certified Foreman* - Provide a certified, trained foreman for each construction operation that increases the potential for soil erosion or the possible sedimentation and turbidity of surface waters.

(C) *Certified Installer* - Provide a certified installer to install or direct the installation for erosion or sediment/stormwater control practices.

(D) *Certified Designer* - Provide a certified designer for the design of the erosion and sediment control/stormwater component of reclamation plans and, if applicable, for the design of the project erosion and sediment control/stormwater plan.

Roles and Responsibilities

(A) *Certified Erosion and Sediment Control/Stormwater Supervisor* - The Certified Supervisor shall be Level II and responsible for ensuring the erosion and sediment control/stormwater plan is adequately implemented and maintained on the project and for conducting the quality control program. The Certified Supervisor shall be on the project within 24 hours notice from initial exposure of an erodible surface to the project's final acceptance. Perform the following duties:

(1) Manage Operations - Coordinate and schedule the work of subcontractors so that erosion and sediment control/stormwater measures are fully executed for each operation and in a timely manner over the duration of the contract.

(a) Oversee the work of subcontractors so that appropriate erosion and sediment control/stormwater preventive measures are conformed to at each stage of the work.
(b) Prepare the required National Pollutant Discharge Elimination System (NPDES) Inspection Record and submit to the Engineer.
(c) Attend all weekly or monthly construction meetings to discuss the findings of the NPDES inspection and other related issues.
(d) Implement the erosion and sediment control/stormwater site plans requested.
(e) Provide any needed erosion and sediment control/stormwater practices for the Contractor's temporary work not shown on the plans, such as, but not limited to work platforms, temporary construction, pumping operations, plant and storage yards, and cofferdams.
(f) Acquire applicable permits and comply with requirements for borrow pits, dewatering, and any temporary work conducted by the Contractor in jurisdictional areas.
(g) Conduct all erosion and sediment control/stormwater work in a timely and workmanlike manner.
(h) Fully perform and install erosion and sediment control/stormwater work prior to any suspension of the work.
(i) Coordinate with Department, Federal, State and Local Regulatory agencies on resolution of erosion and sediment control/stormwater issues due to the Contractor's operations.
(j) Ensure that proper cleanup occurs from vehicle tracking on paved surfaces or any location where sediment leaves the Right-of-Way.
(k) Have available a set of erosion and sediment control/stormwater plans that are initialed and include the installation date of Best Management Practices. These practices shall include temporary and permanent groundcover and be properly updated to reflect necessary plan and field

changes for use and review by Department personnel as well as regulatory agencies.

(2) Requirements set forth under the NPDES Permit - The Department's NPDES Stormwater permit (NCS000250) outlines certain objectives and management measures pertaining to construction activities. The permit references *NCG010000, General Permit to Discharge Stormwater* under the NPDES, and states that the Department shall incorporate the applicable requirements into its delegated Erosion and Sediment Control Program for construction activities disturbing one or more acres of land. The Department further incorporates these requirements on all contracted bridge and culvert work at jurisdictional waters, regardless of size. Some of the requirements are, but are not limited to:

(a) Control project site waste to prevent contamination of surface or ground waters of the state, i.e. from equipment operation/maintenance, construction materials, concrete washout, chemicals, litter, fuels, lubricants, coolants, hydraulic fluids, any other petroleum products, and sanitary waste.

(b) Inspect erosion and sediment control/stormwater devices and stormwater discharge outfalls at least once every 7 calendar days and within 24 hours after a rainfall event of 0.5 inch that occurs within a 24 hour period. Additional monitoring may be required at the discretion of Division of Water Resources personnel if the receiving stream is 303(d) listed for turbidity and the project has had documented problems managing turbidity.

(c) Maintain an onsite rain gauge or use the Department’s Multi-Sensor Precipitation Estimate website to maintain a daily record of rainfall amounts and dates.

(d) Maintain erosion and sediment control/stormwater inspection records for review by Department and Regulatory personnel upon request.

(e) Implement approved reclamation plans on all borrow pits, waste sites and staging areas.

(f) Maintain a log of turbidity test results as outlined in the Department's Procedure for Monitoring Borrow Pit Discharge.

(g) Provide secondary containment for bulk storage of liquid materials.

(h) Provide training for employees concerning general erosion and sediment control/stormwater awareness, the Department’s NPDES Stormwater Permit NCS000250 requirements, and the applicable requirements of the *General Permit, NCG010000*.

(i) Report violations of the NPDES permit to the Engineer immediately who will notify the Division of Water Quality Regional Office within 24 hours of becoming aware of the violation.

(3) Quality Control Program - Maintain a quality control program to control erosion, prevent sedimentation and follow provisions/conditions of permits. The quality control program shall:

(a) Follow permit requirements related to the Contractor and subcontractors' construction activities.
(b) Ensure that all operators and subcontractors on site have the proper erosion and sediment control/stormwater certification.
(c) Notify the Engineer when the required certified erosion and sediment control/stormwater personnel are not available on the job site when needed.
(d) Conduct the inspections required by the NPDES permit.
(e) Take corrective actions in the proper timeframe as required by the NPDES permit for problem areas identified during the NPDES inspections.
(f) Incorporate erosion control into the work in a timely manner and stabilize disturbed areas with mulch/seed or vegetative cover on a section-by-section basis.
(g) Use flocculants approved by state regulatory authorities where appropriate and where required for turbidity and sedimentation reduction.
(h) Ensure proper installation and maintenance of temporary erosion and sediment control devices.
(i) Remove temporary erosion or sediment control devices when they are no longer necessary as agreed upon by the Engineer.
(j) The Contractor's quality control and inspection procedures shall be subject to review by the Engineer. Maintain NPDES inspection records and make records available at all times for verification by the Engineer.

(B) *Certified Foreman* - At least one Certified Foreman shall be onsite for each type of work listed herein during the respective construction activities to control erosion, prevent sedimentation and follow permit provisions:

(1) Foreman in charge of grading activities
(2) Foreman in charge of bridge or culvert construction over jurisdictional areas
(3) Foreman in charge of utility activities

The Contractor may request to use the same person as the Level II Supervisor and Level II Foreman. This person shall be onsite whenever construction activities as described above are taking place. This request shall be approved by the Engineer prior to work beginning.

The Contractor may request to name a single Level II Foreman to oversee multiple construction activities on small bridge or culvert replacement projects. This request shall be approved by the Engineer prior to work beginning.

(C) *Certified Installers* - Provide at least one onsite, Level I Certified Installer for each of the following erosion and sediment control/stormwater crew:

(1) Seeding and Mulching
(2) Temporary Seeding

(3) Temporary Mulching
(4) Sodding
(5) Silt fence or other perimeter erosion/sediment control device installations
(6) Erosion control blanket installation
(7) Hydraulic tackifier installation
(8) Turbidity curtain installation
(9) Rock ditch check/sediment dam installation
(10) Ditch liner/matting installation
(11) Inlet protection
(12) Riprap placement
(13) Stormwater BMP installations (such as but not limited to level spreaders, retention/detention devices)
(14) Pipe installations within jurisdictional areas

If a Level I *Certified Installer* is not onsite, the Contractor may substitute a Level II Foreman for a Level I Installer, provided the Level II Foreman is not tasked to another crew requiring Level II Foreman oversight.

(D) *Certified Designer* - Include the certification number of the Level III-B Certified Designer on the erosion and sediment control/stormwater component of all reclamation plans and if applicable, the certification number of the Level III-A Certified Designer on the design of the project erosion and sediment control/stormwater plan.

Preconstruction Meeting

Furnish the names of the *Certified Erosion and Sediment Control/Stormwater Supervisor, Certified Foremen, Certified Installers* and *Certified Designer* and notify the Engineer of changes in certified personnel over the life of the contract within 2 days of change.

Ethical Responsibility

Any company performing work for the North Carolina Department of Transportation has the ethical responsibility to fully disclose any reprimand or dismissal of an employee resulting from improper testing or falsification of records.

Revocation or Suspension of Certification

Upon recommendation of the Chief Engineer to the certification entity, certification for *Supervisor, Certified Foremen*, *Certified Installers* and *Certified Designer* may be revoked or suspended with the issuance of an *Immediate Corrective Action (ICA), Notice of Violation (NOV),* or C*ease and Desist Order* for erosion and sediment control/stormwater related issues.

The Chief Engineer may recommend suspension or permanent revocation of certification due to the following:

(A) Failure to adequately perform the duties as defined within this certification provision.
(B) Issuance of an ICA, NOV, or Cease and Desist Order.
(C) Failure to fully perform environmental commitments as detailed within the permit conditions and specifications.
(D) Demonstration of erroneous documentation or reporting techniques.
(E) Cheating or copying another candidate's work on an examination.
(F) Intentional falsification of records.
(G) Directing a subordinate under direct or indirect supervision to perform any of the above actions.
(H) Dismissal from a company for any of the above reasons.
(I) Suspension or revocation of one's certification by another entity.

Suspension or revocation of a certification will be sent by certified mail to the certificant and the Corporate Head of the company that employs the certificant.

A certificant has the right to appeal any adverse action which results in suspension or permanent revocation of certification by responding, in writing, to the Chief Engineer within 10 calendar days after receiving notice of the proposed adverse action.

Chief Engineer
1536 Mail Service Center
Raleigh, NC 27699-1536

Failure to appeal within 10 calendar days will result in the proposed adverse action becoming effective on the date specified on the certified notice. Failure to appeal within the time specified will result in a waiver of all future appeal rights regarding the adverse action taken. The certificant will not be allowed to perform duties associated with the certification during the appeal process.

The Chief Engineer will hear the appeal and make a decision within 7 days of hearing the appeal. Decision of the Chief Engineer will be final and will be made in writing to the certificant.

If a certification is temporarily suspended, the certificant shall pass any applicable written examination and any proficiency examination, at the conclusion of the specified suspension period, prior to having the certification reinstated.

Measurement and Payment

Certified Erosion and Sediment Control/Stormwater Supervisor, Certified Foremen, Certified Installers and *Certified Designer* will be incidental to the project for which no direct compensation will be made.

SECTION 02447

HORIZONTAL DIRECTIONAL DRILLING
FOR PIPE INSTALLATION

PART 1 GENERAL

1.01 SCOPE

A. Provide complete installation of fusible polyvinylchloride pipe (FPVCP) by horizontal directional drilling (HDD) as indicated on the drawings.

B. Work shall include, but not be limited, to the following:
   1. General site and access preparation necessary for construction operations.
   2. Assembly of pipe.
   3. Hydrostatic testing of the pipe prior to installation (Contractor's option).
   4. Erection of drilling equipment.
   5. Drilling of a small diameter pilot hole.
   6. Reaming the pilot hole as specified herein to a diameter suitable for installation of the pipe.
   7. Pulling the assembled pipe through the reamed hole along with the detector wire.
   8. Hydrostatic testing of pipe after installation.
   9. Cleanup and final restoration of work area.

1.02 RELATED SECTIONS

A. The following Sections have work that is directly related to this Section. This does not relieve the Contractor of his responsibility of proper coordination of the work:
   1. Section 02230 Clearing and Grubbing
   2. Section 02315 Trenching for Utilities
   3. Section 02510 Water Distribution System

1.03 REFERENCES

A. Publications are referred to in the text by basic designation only.
   1. American Society for Testing and Materials (ASTM)
      a. D1784 Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds
      b. D2152 Test Method for Degree of Fusion of Extruded PVC Pipe and Molded Fittings by Acetone Immersion
      c. D3350 Polyethylene Plastics Pipe and Fittings Materials
   2. American Water Works Association (AWWA)
      a. B300 Hypochlorites
      b. B301 Liquid Chlorine
      c. C104 Cement-Mortar Lining for Ductile-Iron Pipe and Fittings for Water
      d. C105 Polyethylene Encasement for Ductile-Iron Piping for Water and Other Liquids
      e. C111 Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings
      f. C150 Thickness Design of Ductile Iron Pipe
      g. C151 Ductile-Iron Pipe, Centrifugally Cast, for Water
      h. C153 Ductile-Iron Compact Fittings, 3-inch through 24-inch and 54-inch through 64-inch, for Water Service

i. C600 Standard for Installation of Ductile Iron Water Mains and Their Appurtenances
j. C651 Disinfecting Water Mains
k. C900 PVC Pressure Pipe for Water Distribution
l. C905 PVC Pressure Pipe for Water Distribution and Transmission
m. M23 Manual of Supply Practices PVC Pipe – Design and Installation

3. National Sanitation Foundation (NSF) Standards
   a. 14 Plastic Piping Components and Related Materials
   b. 61 Drinking Water System Components – Health Effects

1.04 SUBMITTALS

A. Submit the following in accordance with Section, Submittal Procedures:
   1. Affidavit of Compliance: Affidavit shall attest that supplied products conform to the referenced standard and this specification and that all tests set forth in each applicable referenced publication have been performed and that all test requirements have been met. Submit for each of the following materials:
      a. FPVC Pipe.
   2. Catalog Data: Submit manufacturer's standard drawings or catalog cuts for the following. Clearly indicate equipment to be furnished for the Project including options to be provided.
      a. FPVC Pipe.
   3. Test Reports: Submit for the following:
      a. Field test including calibration report and pressure testing.
   4. Description of the arrangement of directional drilling including method of monitoring and controlling line and grade, schedule, and procedure of installation.
   5. Provide pipe manufacturer’s recommended pull-back pressure to be utilized during installation.
   6. Log sheets as required herein.
   7. Provide certified as-built drawing (plan and profile), including beginning and ending locations of drill, upon completion of drilling.

1.05 QUALITY ASSURANCE

A. Pipe manufacturer shall have an established quality control program responsible for inspecting and testing incoming and outgoing material.

B. Manufacturer shall maintain permanent Quality Control (QC) and Quality Assurance records.

C. Contractor shall employee personal that have a minimum of ten (10) similar installations of FPVC by horizontal directional drilling as appropriate for the installation. Fusing technician shall be qualified by the pipe supplier to install the type(s) and size(s) being used. Qualification shall be current as of the actual date of fusion performance on the project

D. Directional drilling method shall be mechanical with fluid assistance. Pneumatic, water jetting, jacking, and boring method will not be permitted.

E. Install pipe by directional drilling in accordance with the best industry practice, manufacturer’s recommendations and the Contract Documents.

F. Equipment used to monitor pull-back pressure shall be calibrated prior to each installation.

G. Pipe and fusion services shall be warrantied for a minimum of one year from date of acceptance.

PART 2 PRODUCTS

2.01 GENERAL

A. Products with surfaces intended to be in contact with the drinking water shall be certified and listed in accordance with NSF 61 for potable drinking water and bear the NSF seal on each section of pipe.

2.02 MATERIALS

A. Fusible Polyvinylchloride Pipe
   1. Fusible polyvinylchloride pipe shall conform to AWWA C900 or AWWA C905. Testing shall be in accordance with AWWA standards.
   2. Pipe shall be DIPS standard dimensions with a minimum pressure rating of 235 psi (DR18) and the size as indicated on the Drawings.
   3. Piping shall be made from a PVC compound conforming to cell classification 12454 per ASTM D1784.
   4. Fusible polyvinylchloride pipe shall be extruded with plain ends. The ends shall be square to the pipe and free of any bevel or chamfer. There shall be no bell or gasket of any kind incorporated into the pipe.
   5. Fusible polyvinylchloride pipe shall be manufactured in standard 40 foot nominal lengths.
   6. Fusible polyvinylchloride pipe shall be green in color for wastewater use.
   7. Pipe generally shall be marked per industry standards, and shall include as a minimum:
      a. Nominal pipe size
      b. PVC
      c. Dimension Ratio
      d. Pipe legend or stiffness designation, or AWWA pressure class
      e. AWWA Standard designation number
      f. Extrusion production-record code
      g. Trademark or trade name
      h. Cell Classification 12454 and/or PVC material code 1120 may also be included.
   8. Pipe shall be homogeneous throughout and be free of visible cracks, holes, foreign material, blisters, or other visible deleterious faults.

PART 3 EXECUTION

3.01 GENERAL

A. Investigate the subsurface conditions at the crossing location.

B. Provide water for the drilling process.

C. Handle pipe in accordance with manufacturer's recommendation.

D. Utilize pipe rollers during layout and pull-back operations to prevent excess sagging of the pipe. Pipe rollers shall be of sufficient size to fully support the weight of the pipe while being hydro-tested before installation and during pull-back operations.

E. Directional drilling procedure shall include provisions to guard against electrical shock such as ground mats, ground cables, hot boots and gloves. Drilling equipment shall include an alarm system capable of detecting electrical current as it nears electrical lines.

F. Maintain log sheets for drilling fluid pressure, flow rate, drill thrust pressure, pull-back pressure, drill head torque and drill head location plots at 20 foot intervals.

G. Drilling fluids shall be inert and of no risk to the environment. No fluid will be utilized that does not comply with permit requirements and environmental regulations. Drilling fluid should remain in the bore hole to increase the stability of the surrounding soil and to reduce the drag on the pulled pipe.

H. No additional payment will be made for failed attempts.

3.02 DIRECTIONAL DRILLING

A. General
   1. Drill pilot hole along the path shown on the Drawings to the following tolerances:
      a. Vertical Location - Plus or minus 1 foot
      b. Horizontal Location - Plus or minus 6 feet.
   2. At the completion of the pilot hole drilling, provide a tabulation of coordinates referenced to the drilled entry point which accurately describes the location of the pilot hole.
   3. Perform reaming diameter to 1.25 to 1.5 times the outside diameter of the pipe being installed. Prepare pipe to facilitate connection to the remainder of the pipeline being installed.
   4. Use care to protect the pipe from scarring, gouging, or excessive abrasion.
   5. Method of connection between HDD pipe and other pipe materials shall be as indicated on the Drawings.
   6. Pipe shall be deflected within the tolerances as provided by the pipe manufacturer.
   7. For drills under structural conditions (i.e., roadways), perform reaming diameter to 2 inches maximum greater than outside diameter of the pipe being installed. If larger size is necessary, provide statement from North Carolina Professional Engineer stating that “an overbore in excess of 2-inches will arch and no damage will be done to pavement or sub-grade”.

B. Fusible Polyvinylchloride (FPVC) pipe
   1. General
      a. Installation guidelines from the pipe supplier shall be followed for all installations.
      b. The fusible polyvinylchloride pipe will be installed in a manner so as not to exceed the recommended bending radius guidelines.
      c. Where fusible polyvinylchloride pipe is installed by pulling in tension, the recommended maximum safe pulling force, established by the pipe supplier, shall not be exceeded
   2. Handling and Storage
      a. Pipe shall be offloaded, loaded, installed, handled, stored and stacked per the pipe supplier’s guidelines. These guidelines include compliance with the minimum recommended bend radius and maximum safe pull force for the specific pipe being used.
      b. The general best practices of the industry per AWWA M23 shall also be observed.

3. Fusion Joints
    a. Fusible polyvinylchloride pipe lengths shall be assembled in the field with butt-fused joints. The fusion technician shall follow the pipe supplier's guidelines for this procedure. All fusion joints shall be completed as described in this specification.
4. Fusion Process
    a. Fusible polyvinylchloride pipe will be handled in a safe and non-destructive manner before, during, and after the fusion process and in accordance with this specification and pipe supplier's guidelines.
    b. Fusible polyvinylchloride pipe will be fused by qualified fusion technicians holding current qualification credentials for the pipe size being fused, as documented by the pipe supplier.
    c. Pipe supplier's procedures shall be followed at all times during fusion operations.
    d. Each fusion joint shall be recorded and logged by an electronic monitoring device (data logger) affixed to the fusion machine, which utilizes a current version of the pipe supplier's recommended and compatible software.
    e. Only appropriately sized and outfitted fusion machines that have been approved by the pipe supplier shall be used for the fusion process. This includes requirements for safety, maintenance, and operation with minor modifications made for PVC.
5. Installation:
    a. Pull heads for use with FPVCP
        1) Pipe pull heads shall be utilized that employ a positive through-bolt design assuring a smooth wall against the pipe cross-section at all times.
        2) Pipe pull heads shall be specifically designed for use with fusible polyvinylchloride pipe, and shall be as recommended by the pipe supplier.
    b. Pipe shall be fused prior to insertion, if the site and conditions allow, into one continuous length.
    c. Contractor shall handle the pipe in a manner that will not over-stress the pipe prior to insertion. Vertical and horizontal curves shall be limited so that the pipe does not bend past the pipe supplier's minimum allowable bend radius, buckle, or otherwise become damaged. Damaged portions of the pipe shall be removed and replaced.
    d. The pipe entry area shall be graded as needed to provide support for the pipe and to allow free movement into the bore hole.
        1) The pipe shall be guided into the bore hole to avoid deformation of, or damage to, the pipe.
        2) The fusible polyvinylchloride pipe may be continuously or partially supported on rollers or other Owner and Engineer approved friction decreasing implement during joining and insertion, as long as the pipe is not over-stressed or critically abraded prior to, or during installation.
        3) A swivel shall be used between the reaming head and the fusible polyvinylchloride pipe to minimize torsion stress on the pipe assembly.
    e. Buoyancy modification shall be at the sole discretion of the Contractor, and shall not exceed the pipe supplier's guidelines in regards to maximum pull force or minimum bend radius of the pipe. Damage caused by buoyancy modifications shall be the responsibility of the Contractor.

f. Once pull-back operations have commenced, the operation shall continue without interruption until the pipe is completely pulled through the bore hole.
g. The pipe shall be installed in a manner that does not cause upheaval, settlement, cracking, or movement and distortion of surface features. Any damages caused by the Contractor's operations shall be corrected by the Contractor.
h. Once installed, the contractor shall make connections to the open cut pipe by means of mechanical joint fittings, taking care to correct horizontal or vertical alignment with the fittings rather than the Fusible PVC.

3.03 CLEAN UP

A. Upon completion of the pipe installation, backfill the drilling pit and receiving pit as specified.

B. Properly remove and dispose of drilling fluid and spoil material in compliance with relative environmental regulations, right-of-way and work space agreements under permit requirements. Drilling fluid returns at locations other than the entry and exit points shall be minimized. Immediately clean up drilling fluid that inadvertently surfaces.

C. Using available technology, Contractor shall provide a certified as-built drawing with profile indicating the depth from existing grade to the top of HDD pipe from the beginning to the end of the HDD construction.

3.04 FIELD TESTS

A. Prior to Installation Contractor may elect, at his expense, to hydrostatically test or perform a low pressure air test on the pipe line to determine the integrity of the joints. This shall not be considered an alternative to the testing required after installation.

B. Following installation test pipe in accordance with pressure testing in Section 02530, Sanitary Sewer System.

END OF SECTION

SECTION 02510

WATER DISTRIBUTION SYSTEM

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Work under this section includes, but is not limited to, piping, valves, fire hydrants, water service line, and appurtenances for a complete potable water distribution system.

1.02 RELATED SECTIONS

A. The following Sections have work that is directly related to this Section. This does not relieve the Contractor of his responsibility of proper coordination of all the work:
   1. Section 02315 Trenching for Utilities
   2. Section 02445 Bore and Jack of Conduits
   3. Section 02447 Horizontal Directional Drilling for Pipe Installation

1.03 REFERENCES

A. Publications are referred to in the text by basic designation only.
   1. American Society of Sanitary Engineering (ASSE) Standards
      a. 1013 Reduced Pressure Principle Backflow Preventers
      b. 1015 Double Check Backflow Prevention Assembly
      c. 1069 Outdoor Enclosures for Backflow Prevention Assemblies
   2. American Society for Testing and Materials (ASTM)
      a. C443 Flexible Watertight Joints for Precast Manhole Sections
      b. C478 Precast Reinforced Concrete Manhole Sections
      c. C828 Low-Pressure Air Test of Vitrified Clay Pipe Lines (4 to 12 inch)
      d. C890 Minimum Structural Design Loading for Monolithic or Sectional Precast Concrete Water and Wastewater Structures
      e. C923 Resilient Connectors Between Reinforced Concrete Manhole Structures, Pipes and Laterals.
      f. D1784 Rigid Poly(Vinyl Chloride) (PVC) Compounds and Chlorinated Poly(Vinyl Chloride) (CPVC) Compounds
      g. D1785 Poly(Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120
      h. D2241 Poly(Vinyl Chloride) (PVC) Pressure Rated Pipe (SDR Series)
      i. D2466 Socket-Type Poly(Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 40
      j. D2467 Socket-Type Poly(Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80
      k. D3139 Joints for Plastic Pressure Pipes Using Flexible Elastomeric Seals
      l. D3350 Polyethylene Plastics Pipe and Fittings Materials.
      m. F477 Elastomeric Seals (Gaskets) for Joining Plastic Pipe
      n. F1483 Specification for Oriented Poly(Vinyl Chloride) PVCO, Pressure Pipe
   3. American Water Works Association (AWWA)
      a. B300 Hypochlorites
      b. B301 Liquid Chlorine
      c. C104 Cement-Mortar Lining for Ductile-Iron Pipe and Fittings for Water

d. C105 Polyethylene Encasement for Ductile-Iron Piping for Water and Other Liquids
e. C110 Ductile-Iron and Gray-Iron Fittings, 3 inch through 48 inch, for Water and Other Liquids
f. C115 Flanged Ductile-Iron Pipe with Ductile Iron or Gray Iron Threaded Flanges
g. C150 Thickness Design of Ductile Iron Pipe
h. C151 Ductile-Iron Pipe, Centrifugally Cast, for Water
i. C153 Ductile-Iron Compact Fittings, 3 inch through 24 inch and 54 inch through 64 inch, for Water Service
j. C502 Dry-Barrel Fire Hydrants
k. C504 Rubber-Seated Butterfly Valves
l. C508 Swing-Check Valves for Waterworks Service, 2 inch Through 24 inch NPS
m. C509 Resilient Seated Gate Valves for Water and Sewerage Systems
n. C510 Double Check Valve Backflow-Prevention Assembly
o. C511 Reduced-Pressure Principle Backflow-Prevention Assembly
p. C512 Air-Release, Air / Vacuum, and Combination Air Valves for Waterworks Service
q. C550 Protective Epoxy Interior Coatings for Valves and Hydrants
r. C600 Standard for Installation of Ductile Iron Water Mains and Their Appurtenances
s. C605 Underground Installation of Polyvinyl Chloride (PVC) Pressure Pipe and Fittings for Water
t. C651 Disinfecting Water Mains
u. C700 Cold-Water Meters-Displacement Type, Bronze Main Case
v. C701 Cold-Water Meters-Turbine Type, for Customer Service
w. C702 Cold-Water Meters-Compound Type
x. C704 Cold-Water Meters-Propeller Type for Waterworks Applications
y. C800 Underground Service Line Valves and Fittings
z. C900 Polyvinyl Chloride (PVC) Pressure Pipe, 4 inch through 12 inch, for Water Distribution
aa. C901 Polyethylene (PE) Pressure Pipe and Tubing, 1/2 inch through 3 inch for Water Service
bb. C905 Polyvinyl Chloride (PVC) Water Transmission Pipe, 14 inch through 36 inch, for Water Distribution
cc. C909
dd. M23 PVC Pipe - Design Installation

4. National Sanitation Foundation (NSF) Standards
   a. 14 Plastic Piping Components and Related Materials
   b. 60 Drinking Water Treatment Chemicals – Health Effects
   c. 61 Drinking Water System Components - Health Effects
   d. 372 Drinking Water System Components – Lead Content

1.04 SUBMITTALS

A. Submit the following in accordance with Section, Submittal Procedures:
   1. Affidavit of Compliance: Affidavit shall attest that supplied products conform to the referenced standard and this specification and that all tests set forth in each applicable referenced publication have been performed and that all test requirements have been met. Submit for each of the following materials:
      a. Pipe and Fittings
         1) Ductile iron

2) Ductile iron with polyethylene encasement
3) Polyvinyl Chloride (PVC)
i) AWWA C900
ii) Schedule 40 & 80

b. Valves
1) Gate
i) Resilient-Seated

2. Catalog Data: Submit manufacturer's standard drawings or catalog cuts for the following. Clearly indicate equipment to be furnished for the Project including options to be provided.
a. Pipe and Fittings
1) Ductile iron
2) Ductile iron with polyethylene encasement
3) Ductile iron with restrained joints
4) Polyvinyl Chloride (PVC)
i) AWWA C900
ii) Schedule 40 & 80
5) Joint restraint system for C900 PVC

b. Valves
1) Gate
i) Resilient-Seated

c. Valve boxes
d. Fire hydrants

3. Reports:
a. Field test report for each section of pipe for the following:
1) Measured chlorine residual
2) Bacteriological test
3) Pressure test

4. Operation and Maintenance Instructions: Submit complete operation and maintenance manual for the following:
a. Valves
b. Fire hydrants

1.05 DELIVERY, STORAGE, AND HANDLING

A. Provide a suitable pipe hook or rope sling when handling the pipe with a crane. Lifting of the pipe shall be done in a vertical plane. Under no conditions shall the sling be allowed to pass through the pipe unless adequate measures are taken to prevent damage to both the tongue and groove ends.

B. Deliver pipe in the field as near as practicable to the place where it is to be installed. Distribute pipe along the side of the trench opposite to the spoil bank. Where necessary to move the pipe longitudinally along the trench, it shall be done in such a manner as not to injure the pipe or coating.

C. Shield PVC pipe and fittings stored on site from the sun's ultraviolet rays by suitable cover, or indoor storage.

PART 2 PRODUCTS

2.01 GENERAL

A. Products with surfaces intended to be in contact with the drinking water shall be certified and listed in accordance with NSF 61 for potable drinking water.

B. All products that are to be in contact with concrete shall be covered with 10 mil polyethylene sheets prior to pouring concrete.

2.02 POLYVINYL CHLORIDE (PVC) PRESSURE PIPE

A. General
   1. Pipe and fitting size shall be as indicated on the Drawings.
   2. PVC materials shall comply with ASTM D1784 with a cell classification of 12454-B.
   3. Pipe shall be certified and listed for potable water distribution products in accordance with NSF 14 or 61 and bear the NSF seal on each section of pipe.

B. AWWA C900: C900 PVC pipe 4-inch to 48-inch shall conform to AWWA C900 and the following requirements:
   1. Outside diameter shall conform to ductile-iron pipe.
   2. Pipe shall have a pressure rating of 235 with a standard dimension ratio of DR 18.
   3. Pipe shall have plain end and elastomeric-gasket bell ends.
   4. Fittings shall conform to AWWA C110 or C153 and have mechanical joints.
   5. Fittings shall be made of gray-iron or ductile-iron. Interior of fittings shall be cement-mortar lined with seal coat in accordance with AWWA C104 or Ceramapure PL 90 Ceramic Epoxy, or approved equal.
   6. Restraining mechanism for joint restraint must be approved by pipe manufacturer. Restraining systems shall not result in a point load on the pipe. Gasketed-type restraint systems will not be allowed.

C. Schedule 40 & 80: Schedule 40 & 80 PVC pipe 1/2-inch to 12-inch shall conform to ASTM D1785 and the following requirements:
   1. Outside diameter shall conform to iron pipe.
   2. Pipe shall be schedule 40 or 80.
   3. Pipe shall have an integral elastomeric-gasket bell end or solvent weld joints.
   4. Fittings for the pipe shall conform to ASTM D2466 or D2467 as appropriate for the pipe schedule.

2.03 VALVES

A. General: Valves shall meet the following requirements:
   1. Size shall be as required for the pipe size and material as indicated on the Drawings and specified.
   2. Open by counterclockwise rotation.
   3. Provide an interior protective fusion boded epoxy coating in accordance with AWWA C550 on ferrous surfaces in contact with the liquid with a minimum thickness of 16 to 20 mils.
   4. Components in contact with the liquid shall be in compliance with NSF 61.
   5. Standard system working pressure is 150 psi.
   6. Equip valves with a suitable means of operation.
   7. Ends shall be mechanical joint for underground location and flanged joint for above ground location/underground utility vaults.
   8. For buried valves over 5 feet deep, provide extension stems of cold rolled steel to bring the operating nut to within 2 feet of the ground surface. Extension stems shall also be provided as required for floor stands and to floor valve box.
   9. Provide valve accessories as required for proper valve operation for valve locations as indicated on the Drawings and as recommended by valve manufacturer.
   10. Similar valve types shall be of one manufacturer.

11. Valve stems shall be made of bronze ASTM B98 alloy C66100 H02 half-hard bar stock material. The bronze stem collar is to be hot forge upset; collars not integral with the stem are not acceptable. The stem material shall provide a minimum 70,000psi tensile strength, yield strength of 38,000psi and 20% minimum elongation.

B. Gate Valves, Resilient-Seated: Gate valves 3-inch to 20-inch shall conform to AWWA C509 for and to the following requirements:
   1. O-ring stem seal on non-rising (NRS) stem valves.
   2. Valves shall be non-rising stem (NRS) with wrench nut for underground locations.
   3. Valves 16-inch and larger shall be equipped with gearing to facilitate opening. Geared valves shall be equipped with indicators to show the position of the gate in relation to the water.
   4. Gates shall be EPDM encapsulated.

2.04 VALVE ACCESSORIES

A. Valve Box, Below Ground: Boxes shall be high strength cast iron of the screw or telescopic type. Box shall consist of a flare base section, center extension as required, and a top section with the word “WATER” cast in the cover. Length of box shall be such that full extension of box is not required at the depth of water main cover.

2.05 VALVE MARKERS

A. Valve markers shall be used and shall be constructed of fiberglass (blue) marked with letters, either **MV** (main valve) or **AV** (air release valve) and shall specify a telephone number to contact to report problems or to request water main locates. Valve markers shall be required only for valves on transmission mains or as otherwise designated by NCDOT.

B. All markers shall be installed as close to the right of way as possible when within NCDOT rights of way. If it is not feasible to install markers at or near the right of way line, written approval specific to the site shall be obtained from the District Engineer prior to installation.

2.06 FIRE HYDRANTS

A. Fire hydrants shall conform to AWWA C502 and to the following requirements:
   1. Nozzles: Two (2) 2-1/2-inch hose and One (1) 4-1/2-inch pumper connections.
   2. Nozzle threads: National (American) Standard Fire Hose Coupling Screw Threads.
   3. Main valve diameter: 5-1/4.
   4. Minimum depth of bury: 42-inches.
   5. Inlet connection: 6-inch mechanical joint.
   6. Open counterclockwise.
   7. Close with water pressure.
   8. O-ring seals
   9. Traffic model with frangible sections near the ground line designed to break on impact.
   10. Provide extension for hydrant standpipe as required to set centerline of hydrant nozzle a minimum of 15-inches and a maximum of 24-inches.
   11. Exterior color above ground line shall match Owners.
   12. All hydrants of one manufacturer.

2.07 THRUST BLOCKING

A. Thrust blocking is not required. Restrained joint fittings and restrained joint pipe shall be used on all pipe unless shown otherwise on the Drawings.

2.08 DISINFECTANT

A. The following products may be used as the disinfectant:
   1. Chlorine, liquid: AWWA B301.
   2. Hypochlorite, calcium and sodium: AWWA B300.

PART 3 EXECUTION

3.01 GENERAL

A. Pipe installation shall meet the following general guidelines:
   1. Lay pipe in the presence of Engineer, unless specifically approved otherwise.
   2. Handle pipe and accessories in accordance with manufacturer's recommendations. Take particular care not to damage pipe coatings.
   3. Carefully inspect pipe immediately prior to laying. Do not use defective pipe. Replace pipe damaged during construction.
   4. Lay pipe to grade and alignment indicated on the Drawings.
   5. Provide proper equipment for lowering pipe into trench.
   6. Do not lay pipe in water or when the trench or weather conditions are unsuitable for the work.
   7. Provide tight closure pipe ends when work is not in progress.
   8. Keep pipe interior free of foreign materials.
   9. Provide pneumatic plug at the end of line upon completion of daily construction activities and/or when work is not in progress to help avoid debris, animals, etc. from entering pipe system.
   10. Clean bell and spigots before joining. Make joints and lubricate gasket in accordance with pipe manufacturer recommendation.
   11. Pull a swab, as manufactured by Pipeline Pigging Products or equal, through pipe, as installed to remove any debris that may have entered pipe during installation. Swab shall be manufactured for the intended application. Swab shall be pulled using a steel cable. Swab shall be of the same inside diameter as the pipe. Contractor may choose to send swab down the line after construction using water paid for by the Contractor. Contractor shall propose method of removal of swab to be approved by the Engineer
   12. Block fittings with concrete and use restrained pipe as indicated on the Drawings or as required to prevent movement.

3.02 RELATION OF WATER MAINS TO SEWERS

A. Lateral Separation: Lay water mains at least 10 feet laterally from existing and proposed sewers. Where existing conditions prevent a 10-foot lateral separation, the following shall be followed with approval of the Engineer:
   1. Lay water main in a separate trench, with the elevation of the bottom of the water main at least 18 inches above the top of the sewer.
   2. Lay water main in the same trench as the sewer with the water main located at one side on a bench of undisturbed earth, and with the elevation of the bottom of the water main at least 18 inches above the top of the sewer.

B. Crossing Separation: Lay bottom of water main at least 18-inches above the top of the sewer. Where existing conditions prevent an 18-inch vertical separation,

construct both the water main and sewer of ferrous materials and with joints that are equivalent to water main standards for a distance of 10 feet on each side of the point of crossing.

C. Crossing a Water Main Under a Sewer: When it is necessary for a water main to cross under a sewer, construct both the water main and the sewer of ferrous materials and with joints equivalent to water main standards for a distance of 10 feet on each side of the point of crossing. A section of water main pipe shall be centered at the point of crossing.

3.03 DUCTILE IRON PIPE

A. Install pipe in conformance with AWWA C600 and the following:
   1. For laying pipe in a vertical or horizontal curve, each full length pipe may be deflected by the following offset distance:
      a. Push-on joint
         1) 3 to 12-inch pipe: 14-inch offset
         2) 14 to 36-inch pipe: 8-inch offset
      b. Mechanical joint
         1) 3 to 6-inch pipe: 20-inch offset
         2) 8 to 12-inch pipe: 15-inch offset
         3) 14 to 20-inch pipe: 8-inch offset
         4) 24 to 36-inch pipe: 6-inch offset
   2. For laying restrained joint pipe in a vertical or horizontal curve, except for horizontal directional drills (HDD), each full length pipe may be deflected by the following offset distance:
      a. 6 to 12-inch pipe: 11-inch offset
      b. 16 to 20-inch pipe: 7-inch offset
      c. 24 to 30-inch pipe: 5-inch offset
      d. 36-inch pipe: 4-inch offset
      e. 42 to 48-inch pipe: 1 ¼ -inch offset

3.04 PVC PRESSURE PIPE

A. Install PVC C900 pipe in conformance with AWWA C605.

B. Solvent Weld: Field cut ends shall be sanded to roughing the surface. Joints shall be cleaned of foreign material. Solvent shall be applied to the joint and joint made as recommended by the manufacturer. Excess solvent shall be wiped off. Joint should not be moved until sufficiently set up.

C. Bell and Spigot Joints: Clean bell and spigot ends prior to jointing. Ends of field cut pipe shall be beveled with file. Gasket shall be clean and lightly lubricated. Joint shall be made as recommended by the manufacturer.

3.05 VALVES AND FITTINGS

A. Install buried valves on top of an 18-inch square, 3-inch thick, solid concrete pad (minimum dimensions). The concrete pad may be provided by a pre-cast manufacturer or cast-in-place in the field above grade. Concrete used for the pads shall be a minimum 3,000 psi mix. The pads may not be cast-in-place in the pipe trench. Connection to pipe shall be such that there shall be no stress at the joint caused by misalignment or inadequate support of pipe or valve.

B. Valve Box: Set a valve box over each buried valve. Support box so that no stress shall be transmitted to the valve or pipe line. Install box plumb and set top flush with

finished grade. Operating nut shall be centered in box. Provide a 24-inch x 24-inch wide by 6-inch thick concrete pad at top of valve boxes outside paved areas.

C. Valve operation nut shall be within 30 inches of the top of box. Provide stem extension if necessary to bring operating nut to within 30 inches of the top of box.

D. Install fittings as recommended by the manufacturer. Fittings shall be blocked or otherwise restrained from movement.

E. Install valves, gates, and accessories indicated on the Drawings and in complete accordance with the manufacturer's recommendations.

F. Install air / vacuum valve inside a manhole.

3.06 MANHOLES

A. Provide 12 inches of No. 67 stone base to extend a minimum of 6 inches beyond the manhole base.

B. Set base plumb and level. Align manhole invert with pipe invert.

C. Secure pipe connectors to pipe in accordance with manufacturer's recommendation.

D. Clean bells and spigots of foreign material that may prevent sealing. Unroll the butyl sealant rope directly against base of spigot. Do not stretch. Follow manufacturer's instructions when using O-ring seals.

E. Set precast components so that steps align.

F. Plug lift holes using a non-shrink grout. Cover with a butyl sealant sheet on the outside and seal on the inside with an application of an epoxy gel 1/8-inch thick extending 2 inches beyond the opening.

G. Set manhole frames to grade with grade rings. Seal joints between cone, adjusting rings, and manhole frame with butyl sealant rope and sheet.

H. Encase manhole rings in a concrete collar 18-inches wide by 6-inches thick of 3,000 psi concrete beneath paved surfaces.

I. Finish the interior by filling fractures greater than 1/2 inch in length, width or depth with a sand cement mortar. Do not fill the joints between the precast components.

J. Clean the interior of the manhole of foreign matter.

3.07 HYDRANT

A. Set hydrant in accordance with detail on Drawings.

3.08 PAINTING

A. Equipment shall receive the manufacturer's standard coating for the intended application. Coatings shall be suitable for the intended application.

B. Repaint damaged paint services.

C. Above ground piping and piping within vaults shall be painted in accordance with Section, Painting.

3.09 PRESSURE TESTING

A. Pressure test in accordance with AWWA C600 for ductile iron pipe and AWWA C605 and M23 for PVC pipe and as specified herein

B. General:
1. The Engineer shall approve the source, quality, and method of disposal of water to be used in test procedures.
2. Obtain Owner's permission 48 hours prior to filling or flushing of pipe system with water from Owner's water system. Owner shall operate valves connected to the existing water system. Where large quantities of water may be required for flushing, Owner reserves the right to require that flushing be done at periods of low demand.
3. Clean and flush pipe system of foreign matter prior to testing.
4. Provide air vents at the high points in the line section to be tested for releasing of air during filling. Service corporation stops may be used for air vent when located at a high point. Include cost of air vents in price of testing. Leave corporation stops in place after testing and note locations on As-Built Drawings.
5. Allow concrete blocking to reach design strength prior to pressure testing.
6. Test main prior to installation of service taps.
7. Repair defects in the pipe system. Make repairs to the same standard as specified for the pipe system.
8. Retest repaired sections until acceptance.
9. Repair visible leaks regardless of the test results.
10. Pipe sections shall not be accepted and placed into service until specified test limits have been met.

C. Testing
1. Notify Owner and Engineer a minimum of 48 hours prior to testing.
2. Perform tests in the presence of Engineer.
3. Make pressure tests between valves. Furnish suitable test plugs where line ends in "free flow."
4. Upon completing a section of pipe between valves, test pipe by maintaining for a two hour period a hydrostatic pressure of 200 psig.
5. Test pressure shall not vary by more than +/- 5 psi for the duration of the test.
6. No length of line shall be accepted if the leakage is greater than that determined by the following formula based on the appropriate test pressure:
L = Allowable leakage per 1,000 feet of pipe in gallons per hour.
D = Nominal diameter of the pipe in inches.
100 psi: L = D x 0.07
150 psi: L = D x 0.08
200 psi: L = D x 0.09
250 psi: L = D x 0.10

3.10 DISINFECTION

A. After satisfactory completion of the pressure test, disinfect new potable water mains and existing mains that have required repair in accordance with AWWA C651 and as specified herein. Disinfect water mains in a maximum length per day of 2,000 feet.

B. General:
1. Provide a superintendent experienced in the required procedures for disinfecting with chlorine.
2. Obtain Owner's permission 48 hours prior to filling, flushing, and chlorinating of the water mains. Owner shall operate valves connected to the existing water system.
3. Do not allow highly chlorinated water into the existing distribution system.

4. If there is any question that the chlorinated discharge will cause damage to the environment, a reducing agent shall be applied to the water to neutralize the residual chlorine. Federal, state, or local environmental regulations may require special provisions or permits prior to disposal of highly chlorinated water.
5. Perform disinfection and testing in presence of Engineer.

C. Connection to Existing System: Notify Owner 48 hours prior to making connections to the existing system. Thoroughly clean the existing water main exterior prior to the installation of tapping sleeves and corporation stops. Lightly dust with calcium hypochlorite powder the water main exterior and the interior surface of the tapping sleeve, and corporation stops.

D. After satisfactory flushing of the main, disinfect by the injection of a chlorine solution. Induce chlorine in sufficient quantity to maintain a chlorine residual of at least 50 ppm throughout the system to be tested. Maintain the chlorine solution in the system for at least 24 hours.

E. Valves and Fire Hydrants: Open and close valves on the mains being disinfected a minimum of three times during the chlorine contact period and a minimum of three times during flushing. Fire hydrants and other appurtenances should receive special attention to insure proper disinfection.

F. For Cut-In Construction: Use the following procedures for disinfecting of the new installation and the existing main at the cut-in point in accordance with AWWA C651, Section 9:
1. Apply liberal quantities of hypochlorite, in the form of tablets, to the open trench.
2. Interior of new pipe and fittings and the ends of the existing mains shall be swabbed or sprayed with a one percent hypochlorite solution before installation.
3. Install a 2-inch tap downstream of the work area. Tap shall be used for blowing off the main, or use the next fire hydrant downstream of the work area for blowing off the main.
4. Install a 2-inch tap just upstream of the new installation. Control Water from the existing system so as to flow slowly into the work area during the application of chlorine. After the line is thoroughly flushed, add chlorine solution at a concentration of 100 ppm by the continuous feed method and hold in the main for one (1) hour.

G. Prior to flushing, the free chlorine residual shall be a minimum of 10 ppm. Flushing of the lines shall proceed until the lines contain the normal chlorine residual of the system.

H. Test in the field for free chlorine residual:
1. Sample location shall be the same as required for the bacteriological test samples.
2. Immediately after injection of the chlorine solution. Sample shall have a chlorine residual as specified.
3. Prior to flushing of the highly chlorinated water from the potable water system and a minimum of 24-hours after the initial injection of the chlorine. Sample shall have a minimum chlorine residual as specified.

3.11 BACTERIOLOGICAL TESTING

A. Required location for obtaining water samples:
1. Every 2,000 lf
2. End of each main.
3. A minimum of one from each branch.

4. Mains at cut-in locations: Each side of work area. Time between samples to be determined by Engineer in field.

B. A laboratory, certified for the required testing by the State of North Carolina, shall collect the sample and perform the testing. The laboratory shall be the same for both sampling and testing.

C. Obtain two water samples at each specified location for the bacteriological testing. Take the first sample immediately after flushing of the chlorinated water and again in 24-hours.

D. Recommended additional samples. During the required sampling of water from the new system, it is recommended that samples be taken from the existing potable water source to determine if coliforms are present.

E. Care in sampling. No hose or fire hydrant shall be used for the collection of samples. Take samples from an approved sample tap consisting of a corporation stop installed in the main with a copper tube gooseneck assembly. Operation shall be such as to ensure that the sample collected is actually from water that has been in the new system. Copper tube gooseneck assembly shall be removed and sample tap corporation stop shut off upon completion of testing bacteriological testing is requirements.

F. Test samples for the presence of coliform organisms in accordance with the latest edition of Standard Methods for the Examination of Water and Wastewater. Testing method used shall be the multiple-tube fermentation technique, the membrane-filter technique, or presence/absence.

G. Test for odor. The water in the new system should also be tested to assure that no offensive odor exists due to chlorine reactions or excess chlorine residual.

H. If samples show the presence of coliform, procedure 1 or 2 described below shall be followed, with the approval of the Owner, before placing the unit or facility in service.
   1. Take repeat samples at least 24 hours apart until consecutive samples do not show the presence of coliform.
   2. Again subject the system to chlorination and sampling as described in this section.

I. If samples are free of coliform, and with the approval of the Owner, the potable water system may be placed in service.

J. Contamination: If, in the opinion of the Engineer, possible contaminants have entered the existing water system, or water samples show the water in the existing system to be unsafe on completion of the work, the existing water system shall be disinfected as specified herein and shall include all contaminated components. Disinfection of the existing system shall be coordinated with the Owner.

3.12 VALVE OPERATION

A. Prior to final acceptance provide competent personnel to operate each valve in presence of Engineer. Verify that valves are left in the open position.

END OF SECTION

Geotechnical Data Report
I-95 Water Main HDD Crossing
Battleboro, North Carolina
S&ME Project No. 1305-18-083

PREPARED FOR:

The Wooten Company
120 North Boylan Avenue
Raleigh, North Carolina 27603

PREPARED BY:

S&ME, Inc.
3201 Spring Forest Road
Raleigh, North Carolina 27616

August 15, 2018

August 15, 2018

The Wooten Company
120 North Boylan Avenue
Raleigh, North Carolina 27603

Attention: Mr. James R. Gregg, P.E.

Reference: **Geotechnical Data Report**
I-95 Water Main HDD Crossing
Battleboro, North Carolina
S&ME Project No. 1305-18-083
NC PE Firm License No. F-0176

Dear Mr. Gregg:

S&ME, Inc. (S&ME) has completed the 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 a new water main to be installed beneath I-95 in Nash County, North Carolina. Our work was performed in general accordance with S&ME Proposal No. 13-1800209 dated May 9, 2018. Our services were formally authorized on July 27, 2018.

S&ME appreciates the opportunity to provide geotechnical exploration and testing services for this project. If you have questions or need additional information in regard to this report, please contact us.

Sincerely,

S&ME, Inc.

Elliot Blonshine
Geotechnical Staff Professional

NORTH CAROLINA PROFESSIONAL SEAL 34358 ENGINEER KEVIN A. NADEAU
8-15-18

Kevin A. Nadeau, P.E.
Senior Geotechnical Engineer
Registration No. 34358

Senior reviewed by Matt Moler, P.E.

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List of Tables

Appendices

1.0 Project Information

Project information was obtained from e-mail correspondence between you and Mr. Kevin Nadeau with S&ME on April 20, 2018. We understand that The Wooten Company is providing design services for a new water main to be installed beneath I-95 in Nash County, North Carolina as shown in the Site Vicinity Plan (Figure 1 in Appendix I). More specifically, the planned crossing will be near the rest area just north of the I-95 and NC43 interchange. The water main will be installed by horizontal directional drilling (HDD). Specific information related to pipe/casing diameters or depth was not provided at the time of this report.

A Geotechnical Data Report summarizing the exploration, laboratory testing, site geology, and anticipated subsurface conditions based on our findings was requested.

2.0 Geology

The site is located in the Coastal Plain Physiographic Province of North Carolina near the contact with the Piedmont Province. The Coastal Plain Province is typically characterized by marine and eolian sediments that were deposited during periods of fluctuating sea levels and moving shore lines. As such, the Coastal Plain Province is characterized by subdued topographic features and flat low-lying terrain. Near surface soils often consist of more recent undifferentiated deposits of interbedded sand, silts, and clays. Deeper deposits also consist of sand, silts, and clays but can be defined as particular formations with distinguishable characteristics and engineering properties.

The primary geologic formation within the area of the site is upland terrace deposits. Terrace deposits consist of clayey sand and sand with varying amounts of gravel. The nearby Eastern Slate Belt of the Piedmont Province underlies the terrace deposits. Parent rock materials in this region primarily consist of low-grade, felsic and mafic metavolcanic rocks with metaplutonic (granites) and metasedimentary (sandstone and mudstone) rocks. Soils within the Piedmont Province are the residual product of chemical and physical weathering of parent rock materials. The typical residual profile consists of finer grained silts and clays near the surface which gradually transition to coarser and denser material with depth. In many locations, the transitional zone between soil and rock is not well defined. Locally, the transitional zone is termed partially weathered rock (PWR). For engineering purposes, partially weathered rock is considered as residual material in which standard penetration test N-values exceed 100 blows per foot.

3.0 Exploration Procedures

3.1 Field

Two soil test borings (labeled B-1 and B-2) were conducted at the approximate locations indicated on Figure 2 (Boring Location Plan in Appendix I). The borings were located approximately east and west of I-95. The alignment of these borings was approximately parallel to the planned waterline alignment.

Boring locations were selected by The Wooten Company and located in the field by S&ME personnel using existing site features as reference. Ground surface elevations presented on the Boring Logs were provided by The Wooten Company.

Standard Penetration Test (SPT) borings were performed using a CME 550 ATV-mounted drill rig. Borings were advanced using 2¼-inch inside-diameter hollow stem augers to termination depths of 40 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. Subsequent to 24-hour water level readings, the boreholes were backfilled with cement-bentonite grout placed through a tremie pipe to within 5 feet of the ground surface and the final 5 feet backfilled with soil.

3.2 Laboratory

Samples were returned to our laboratory where a geotechnical staff professional visually examined each soil sample to assess general distribution of grain sizes, plasticity, organic content, moisture condition, color, and apparent geological origin. The results of the classifications are presented on the individual Boring Logs included in Appendix II. 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 III. A Summary of Laboratory Test Data table is also included in Appendix III.

4.0 HDD Subsurface Conditions

Subsurface conditions at the HDD crossing/installation were characterized based on subsurface conditions encountered and geologic setting. Soils with similar HDD drilling characteristics were grouped into Strata (as shown in Table 4-1) 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 as shown in Table 4-2. Based on our experience with HDD and the area geology, the attached Table A-1 summarizes our comments relative to HDD natural geologic hazards associated with the subject site. The Strata contacts shown on the Generalized Subsurface Profile in Appendix I may vary between the 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.

Table 4-1 – HDD Strata Interpretation

Strata	Description	Percent of Material			USCS	SPT (blows/ft)
		Gravel	Sand	Silt/Clay		
I	COASTAL PLAIN SOILS: Undifferentiated Coastal Plain Soils (stiff to hard silt and medium dense to very dense silty and clayey sand)	0 to < 1%	10% to 70%	30% to 90%	MH, SM, SC	10 to 83
II	COASTAL PLAIN SOILS: Undifferentiated Coastal Plain Soils (silty and clayey sand)	0	70% to 80%	20% to 30%	SM, SC	2 to 4
III	RESIDUAL SOILS: (medium dense silty sand)	0	50% to 60%	40% to 50%	SM	10 to 19

Notes:

1. USCS – Unified Soil Classification System, visual classification.
2. SPT – Standard Penetration Test "N" value. Tests performed with an autohammer.
3. 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 both borings at depths of approximately 12 feet or 16 feet below ground surface, measured 24 hours after the completion of drilling operations. These depths correspond to approximate elevations of 174 and 178 feet. The groundwater level typically fluctuates during the year due to seasonal and climatic changes.

Based on data obtained during our field and laboratory exploration, we recommend the following parameters for use in design of the HDD program.

Table 4-2 – HDD Design Parameters

Strata	Friction Angle (degrees)	Cohesion (psf)	Unit Weight (pcf)	
			Total	Submerged
I	32	0	115	53
II	26	0	105	43
III	32	0	115	53

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.

Appendices

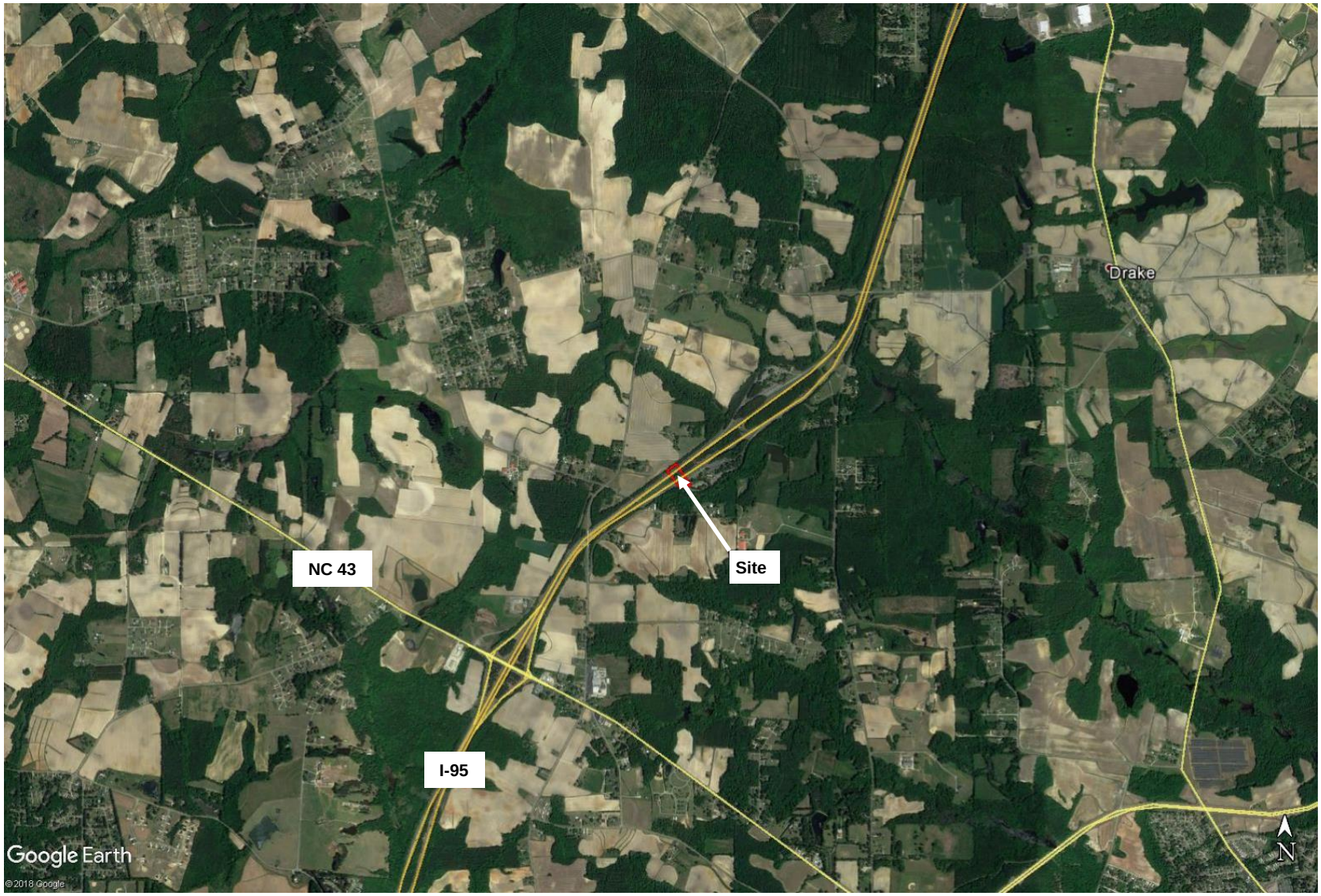
Table A-1 – HDD Natural Geologic Hazards

SUBSURFACE CONDITIONS AND HDD DIFFICULTY[1,2]				SITE SUBSURFACE CONDITIONS AND HDD DIFFICULTY[2,6]		
Subsurface Condition	Generally Suitable[3]	Difficulties May Occur[4]	Substantial Problems[5]	Consistent with Geology	Encountered by Borings	Comments
Soft to very soft clays, silts, and organic deposits[1]		X		Yes	No	
Medium to very stiff clays and silts[1]	X			Yes	B-1, B-2	Encountered by both borings above 8 feet.
Hard clays and highly weathered shales[1]	X			No	No	
Very loose to loose sands above and below the water table (not more than 30% gravel by weight)[1,2,7]		X		Yes	B-1, B-2	Encountered in boring B-1 from 12 - 32 feet and in B-2 from 12 - 27 feet.
Medium to dense sands above or below the water table (not more than 30% gravel by weight)[1,2,7]	X			Yes	B-1, B-2	Encountered in boring B-1 from 12 to 32 feet and in boring B-2 from 12 to 22 feet.
Very loose to dense gravelly sand, (30% to 50% gravel by weight)[1,2,7]		X		Yes	No	
Very loose to dense gravelly sand (50% to 85% gravel by weight)[1,2,7]			X	No	No	
Very loose to very dense gravel[1,2]			X	No	No	
Soils with significant cobbles, boulders, and obstructions[1]			X	No	No	
Weathered rocks, marls, chalks, and firmly cemented sands[1]	X			Yes	No	
Slightly weathered to un-weathered rock[1]		X		Yes	No	
Material with sufficient potential swell upon exposure to water to reduce borehole diameter		X		No	No	
Karst geology or preferential seepage paths potentially resulting in loss of drilling fluid circulation			X	No	No	
Rock fill or fill containing rock			X	N/A	No	

NOTES

[1] Adapted from ASTM F1962, Table 1-"Subsurface Conditions and Suitability of Horizontal Directional Drilling". Subsurface Conditions with a superscript of [1] are directly from this reference.
[2] "Subsurface Conditions and HDD Difficulty" and "Site Subsurface Conditions and HDD Difficulty" are professional opinions based on experience with the site geology; subsurface conditions encountered by borings performed for this exploration; and subsurface soil conditions known to be difficult for HDD construction. The suitability of each site for HDD construction must be evaluated individually.
[3] "Generally Suitable" presumes a knowledgeable, experienced contractor and personnel using appropriate tooling and equipment.
[4] "Difficulties May Occur" that can be addressed by tooling, equipment, drilling mud, and contractor means and methods.
[5] "Substantial Problems" up to and including conditions that may be unsuitable for use of the HDD construction method.
[6] Manmade conditions such as foundations, utilities, environmental contamination, excavation slopes, etc. are not considered.
[7] The inside diameter of Spilt Spoon Samplers (ASTM D1586) is 1-3/8 inches. Gravel larger than 1-3/8 inches in diameter cannot be recovered from split spoon samplers used for this exploration which may result in the percent gravel and maximum gravel size being underestimated.

Appendix I – Figures



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NOTE:
THIS AERIAL PHOTOGRAPH FROM GOOGLE EARTH WAS MODIFIED BY S&ME.

	SITE VICINITY PLAN	SCALE: NOT TO SCALE	FIGURE NO. 1
	I-95 WATER MAIN HDD CROSSING I-95 BATTLEBORO, NORTH CAROLINA	DATE: 8/9/2018 PROJECT NUMBER 1305-18-083	

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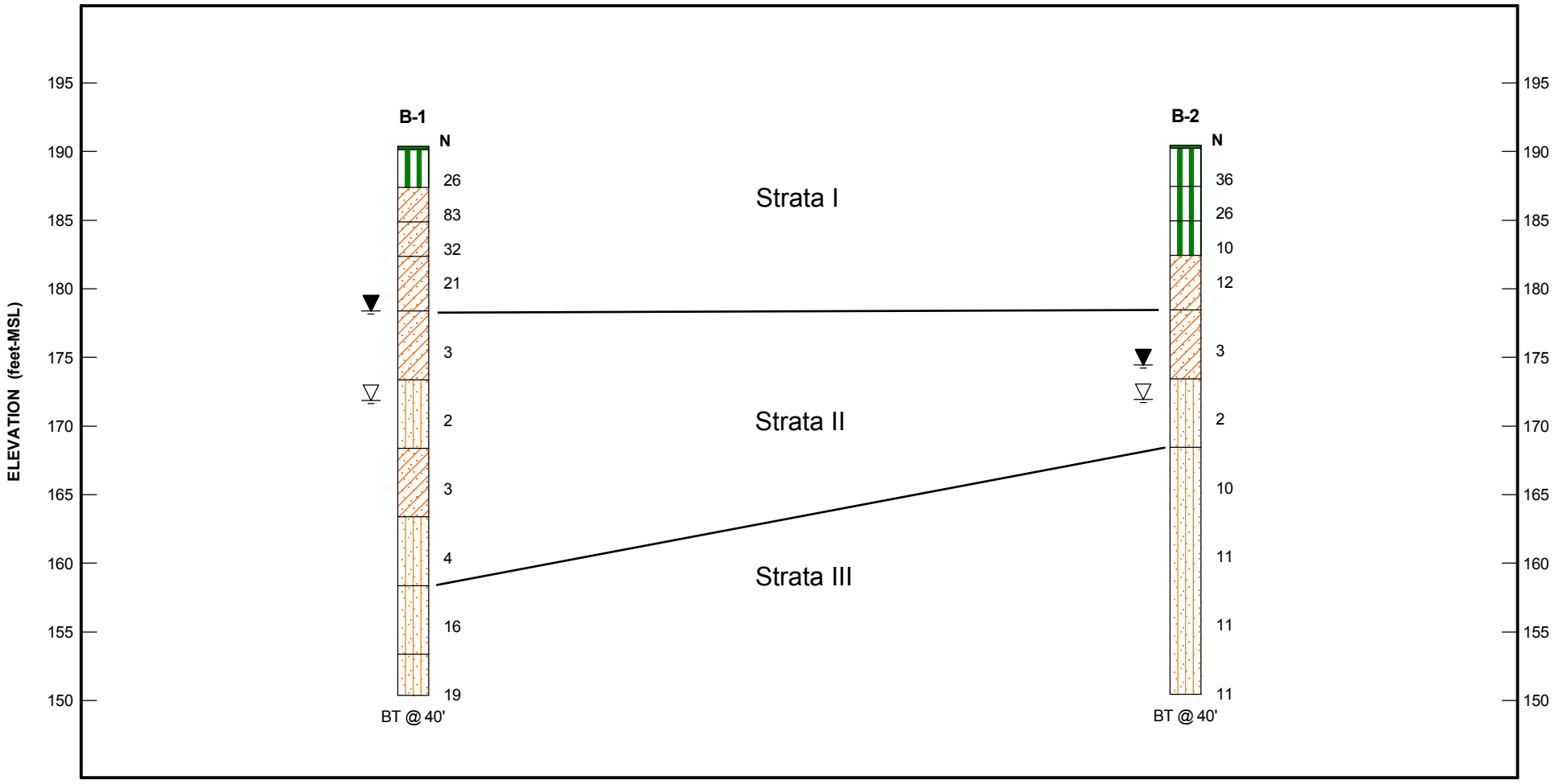
NOTE:
THIS AERIAL PHOTOGRAPH FROM GOOGLE EARTH WAS MODIFIED BY S&ME.

LEGEND:
APPROXIMATE BORING LOCATION

BORING LOCATION PLAN

I-95 WATER MAIN HDD CROSSING
I-95
BATTLEBORO, NORTH CAROLINA

SCALE:	FIGURE NO.
NOT TO SCALE	2
DATE:	
8/9/2018	
PROJECT NUMBER	
1305-18-083	



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. Elevations are approximate.

JOB NO: 1305-18-083		Diagram: Generalized Subsurface Conditions	Figure 3
DATE: 8/13/18		Project: HDD Water Main Crossing I-95	
		Location: Battleboro, North Carolina	

Appendix II – Soil Test Borings

LEGEND TO SOIL CLASSIFICATION AND SYMBOLS

SOIL TYPES

(Shown in Graphic Log)


Fill


Asphalt


Concrete


Topsoil


Gravel


Sand


Silt


Clay


Organic


Silty Sand


Clayey Sand


Sandy Silt


Clayey Silt


Sandy Clay


Silty 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	STD. PENETRATION RESISTANCE BLOWS/FOOT
Very Soft	0 to 2
Soft	3 to 4
Firm	5 to 8
Stiff	9 to 15
Very Stiff	16 to 30
Hard	31 to 50
Very Hard	Over 50

RELATIVE DENSITY OF COHESIONLESS SOILS

RELATIVE DENSITY	STD. PENETRATION RESISTANCE BLOWS/FOOT
Very Loose	0 to 4
Loose	5 to 10
Medium Dense	11 to 30
Dense	31 to 50
Very Dense	Over 50

SAMPLER TYPES

(Shown in Samples Column)


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: **HDD Water Main Crossing I-95**
Battleboro, North Carolina
S&ME Project No. 1305-18-083

BORING LOG **B-1**

DATE DRILLED: **7/18/18**	ELEVATION: **190.4 ft**	NOTES: **Boring location and elevation are approximate.** **Borehole backfilled with cement-bentonite grout.**
DRILL RIG: **CME 550**	BORING DEPTH: **40.0 ft**	
DRILLER: **J&L Drilling**	WATER LEVEL: **18.5' ATD, 12' 24 hr**	
HAMMER TYPE: **Safety**	LOGGED BY: **E. Blonshine**	
SAMPLING METHOD: **Split spoon**	NORTHING: **830275.409**	EASTING: **2339909.946**

DRILLING METHOD: **2¼" H.S.A.**

DEPTH (feet)	MATERIAL DESCRIPTION	ELEVATION (feet)	SAMPLE NO.	SAMPLE TYPE	BLOW COUNT / CORE DATA 1st 6in / RUN #	2nd 6in / REC	3rd 6in / RQD	N VALUE
	Topsoil (2 inches)							
	COASTAL PLAIN: SILT (MH) very stiff, orange tan, with sand, relatively dry				14	12	14	26
5	**CLAYEY SAND (SC)** very dense, red tan, fine, relatively dry	185.4			17	35	48	83
	CLAYEY SAND (SC) dense, gray red, medium, moist				7	13	19	32
10	**CLAYEY SAND (SC)** medium dense, tan orange, coarse, moist	180.4			14	10	11	21
	CLAYEY SAND (SC) very loose, orange tan, trace mica, medium to fine, wet				2	1	2	3
15		175.4						
	SILTY SAND (SM) very loose, orange tan, trace mica, fine, wet				1	1	1	2
20		170.4						
	CLAYEY SAND (SC) very loose, orange tan, trace mica, medium to fine, wet				2	1	2	3
25		165.4						
	SILTY SAND (SM) very loose, tan, trace mica, fine, wet				2	2	2	4
30		160.4						
	RESIDUUM: SILTY SAND (SM) medium dense, pink tan, trace manganese, fine, wet				4	6	10	16

STANDARD PENETRATION TEST DATA (blows/ft) / REMARKS — 10 20 30 60 80

S&ME BORING LOG 1305-18-083 HDD MAIN CROSSING I-95.GPJ S&ME.GDT 8/15/18

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:	**HDD Water Main Crossing I-95** **Battleboro, North Carolina** **S&ME Project No. 1305-18-083**	**BORING LOG**	**B-1**

DATE DRILLED: **7/18/18**	ELEVATION: **190.4 ft**	NOTES: **Boring location and elevation are approximate.**	
DRILL RIG: **CME 550**	BORING DEPTH: **40.0 ft**	**Borehole backfilled with cement-bentonite grout.**	
DRILLER: **J&L Drilling**	WATER LEVEL: **18.5' ATD, 12' 24 hr**		
HAMMER TYPE: **Safety**	LOGGED BY: **E. Blonshine**		
SAMPLING METHOD: **Split spoon**		NORTHING: **830275.409**	EASTING: **2339909.946**

DRILLING METHOD: **2¼" H.S.A.**

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	N VALUE
										10 20 30 60 80	
		SILTY SAND (SM) medium dense, pink brown, trace manganese, little mica, medium to fine, wet					5	6	13		19
40		Boring terminated at 40 ft		150.4							

S&ME BORING LOG 1305-18-083 HDD MAIN CROSSING I-95.GPJ S&ME.GDT 8/15/18

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PROJECT: **HDD Water Main Crossing I-95**
Battleboro, North Carolina
S&ME Project No. 1305-18-083

BORING LOG **B-2**

DATE DRILLED: **7/18/18**	ELEVATION: **190.5 ft**	NOTES: **Boring location and elevation are approximate.**
DRILL RIG: **CME 550**	BORING DEPTH: **40.0 ft**	**Borehole backfilled with cement-bentonite grout.**
DRILLER: **J&L Drilling**	WATER LEVEL: **18.5' ATD, 16' 24 hr**	
HAMMER TYPE: **Safety**	LOGGED BY: **E. Blonshine**	
SAMPLING METHOD: **Split spoon**	NORTHING: **830043.877**	EASTING: **2340088.421**

DRILLING METHOD: **2¼" H.S.A.**

DEPTH (feet)	MATERIAL DESCRIPTION	ELEVATION (feet)	SAMPLE NO.	SAMPLE TYPE	BLOW COUNT / CORE DATA 1st 6in / RUN #	2nd 6in / REC	3rd 6in / RQD	N VALUE
	Topsoil (2 inches)							
	COASTAL PLAIN: SILT (MH) hard, brown, with sand, trace gravel, moist				16	18	18	36
5	**SILT (MH)** very stiff, tan red, with sand, moist	185.5			6	11	15	26
	SILT (MH) stiff, tan red, with sand, trace mica, moist				3	4	6	10
10	**CLAYEY SAND (SC)** medium dense, red, coarse to fine, moist	180.5			4	5	7	12
	CLAYEY SAND (SC) very loose, red, trace mica, coarse to fine, wet	175.5			2	2	1	3
15	▼							
	SILTY SAND (SM) very loose, red, trace mica, coarse to fine, wet	170.5			2	1	1	2
20	▽							
	RESIDUUM: SILTY SAND (SM) loose to medium dense, red brown, little mica, trace manganese, coarse, wet	165.5			4	4	6	10
25		160.5			4	4	7	11
30					3	4	7	11

STANDARD PENETRATION TEST DATA (blows/ft) / REMARKS
10 20 30 60 80

S&ME BORING LOG 1305-18-083 HDD MAIN CROSSING I-95.GPJ S&ME.GDT 8/15/18

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:	**HDD Water Main Crossing I-95** **Battleboro, North Carolina** **S&ME Project No. 1305-18-083**	**BORING LOG**	**B-2**

DATE DRILLED: **7/18/18**	ELEVATION: **190.5 ft**	NOTES: **Boring location and elevation are approximate.**	
DRILL RIG: **CME 550**	BORING DEPTH: **40.0 ft**	**Borehole backfilled with cement-bentonite grout.**	
DRILLER: **J&L Drilling**	WATER LEVEL: **18.5' ATD, 16' 24 hr**		
HAMMER TYPE: **Safety**	LOGGED BY: **E. Blonshine**		
SAMPLING METHOD: **Split spoon**		NORTHING: **830043.877**	EASTING: **2340088.421**

DRILLING METHOD: **2¼" H.S.A.**

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 60 80	N VALUE
		RESIDUUM: SILTY SAND (SM) loose to medium dense, red brown, little mica, trace manganese, coarse, wet *(continued)*									
							5	5	6		11
40		Boring terminated at 40 ft		150.5							

S&ME BORING LOG 1305-18-083 HDD MAIN CROSSING I-95.GPJ S&ME.GDT 8/15/18

NOTES:

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Appendix III – Laboratory

SUMMARY OF LABORATORY TEST DATA
HDD Water Main Crossing I-95
Battleboro, North Carolina
S&ME Project No. 1305-18-083

SAMPLE LOCATION				Sample Type	Consistency	USCS Classification	Atterberg Limits			Natural Moisture Content	Diameter (millimeters)				% Silt and Clay	% Sand			% Gravel
Boring	Sample #	Depth (ft)	Strata				LL	PL	PI	%	D_{100}	D_{60}	D_{30}	D_{10}		Fine	Medium	Coarse	
B-1	SS-2	3.5 - 5	I	SS	v. dense	SC	--	--	--	14.8	4.75	0.21	--	--	45.1	35.4	16.4	3.2	0.0
	SS-3	6 - 7.5	I	SS	dense	SC	--	--	--	13.4	9.50	0.63	--	--	33.3	20.2	36.9	9.0	0.6
	SS-6	18.5 - 20	II	SS	v. loose	SM	--	--	--	40.1	4.75	0.14	0.076	--	30.2	64.9	4.7	0.2	0.0
	SS-8	28.5 -30	II	SS	v. loose	SM	--	--	--	31.6	4.75	0.15	0.09	--	24.5	72.5	2.7	0.3	0.0
	SS-10	38.5 - 40	III	SS	m. dense	SM	--	--	--	41.5	4.75	0.17	--	--	43.9	32.7	22.3	1.1	0.0
B-2	SS-1	1 - 2.5	I	SS	hard	MH	52	32	20	21.3	--	--	--	--	--	--	--	--	--
	SS-3	6 - 7.5	I	SS	stiff	MH	65	46	19	33.0	--	--	--	--	--	--	--	--	--
	SS-6	18.5 - 20	II	SS	v. loose	SM	41	38	3	48.2	--	--	--	--	--	--	--	--	--
	SS-8	28.5 - 30	III	SS	m. dense	SM	36	35	1	33.4	--	--	--	--	--	--	--	--	--
	SS-9	33.5 - 35	III	SS	m. dense	SM	55	52	3	40.7	--	--	--	--	--	--	--	--	--

LL - Liquid Limit
PL - Plastic Limit
PI - Plasticity Index
SS - Split Spoon

Form No: TR-D2216-T265-2
Revision No. 1
Revision Date: 08/16/17

LABORATORY DETERMINATION OF WATER CONTENT

ASTM D 2216 ☑ *AASHTO T 265* ☐

S&ME, Inc. Raleigh: 3201 Spring Forest Road, Raleigh, NC 27616

Project #:	1305-18-083	Report Date:	7/28/18
Project Name:	HDD Main Crossing I-95	Test Date(s):	7/27 - 7/28/18
Client Name:			
Client Address:			
Sample by:	J&L Drilling	Sample Date(s):	7/18/18
Sampling Method:	Split Spoon	Drill Rig :	N/A

Method: **A (1%)** ☐ **B (0.1%)** ☑ Balance ID. 20977 Calibration Date: 4/9/18 Oven ID. 1454 Calibration Date: 11/21/17

Boring No.	Sample No.	Sample Depth	Tare #	Tare Weight	Tare Wt.+ Wet Wt	Tare Wt. + Dry Wt	Water Weight	Percent Moisture
		ft.		grams	grams	grams	grams	%
B-1	SS-2	3.5-5		8.72	181.95	159.59	22.36	14.8%
B-1	SS-3	6-7.5		8.19	228.20	202.26	25.94	13.4%
B-1	SS-6	18.5-20		8.21	285.06	205.87	79.19	40.1%
B-1	SS-8	28.5-30		8.24	245.72	188.75	56.97	31.6%
B-1	SS-10	38.5-40		8.24	186.53	134.20	52.33	41.5%
B-2	SS-1	1-2.5		49.16	110.84	100.00	10.84	21.3%
B-2	SS-3	6-7.5		48.64	107.53	92.93	14.60	33.0%
B-2	SS-6	18.5-20		50.37	126.29	101.60	24.69	48.2%
B-2	SS-8	28.5-30		49.05	117.84	100.60	17.24	33.4%
B-2	SS-9	33.5-35		45.56	115.62	95.36	20.26	40.7%

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		Laboratory Manager	8/8/2018
Technical Responsibility	*Signature*	*Position*	*Date*

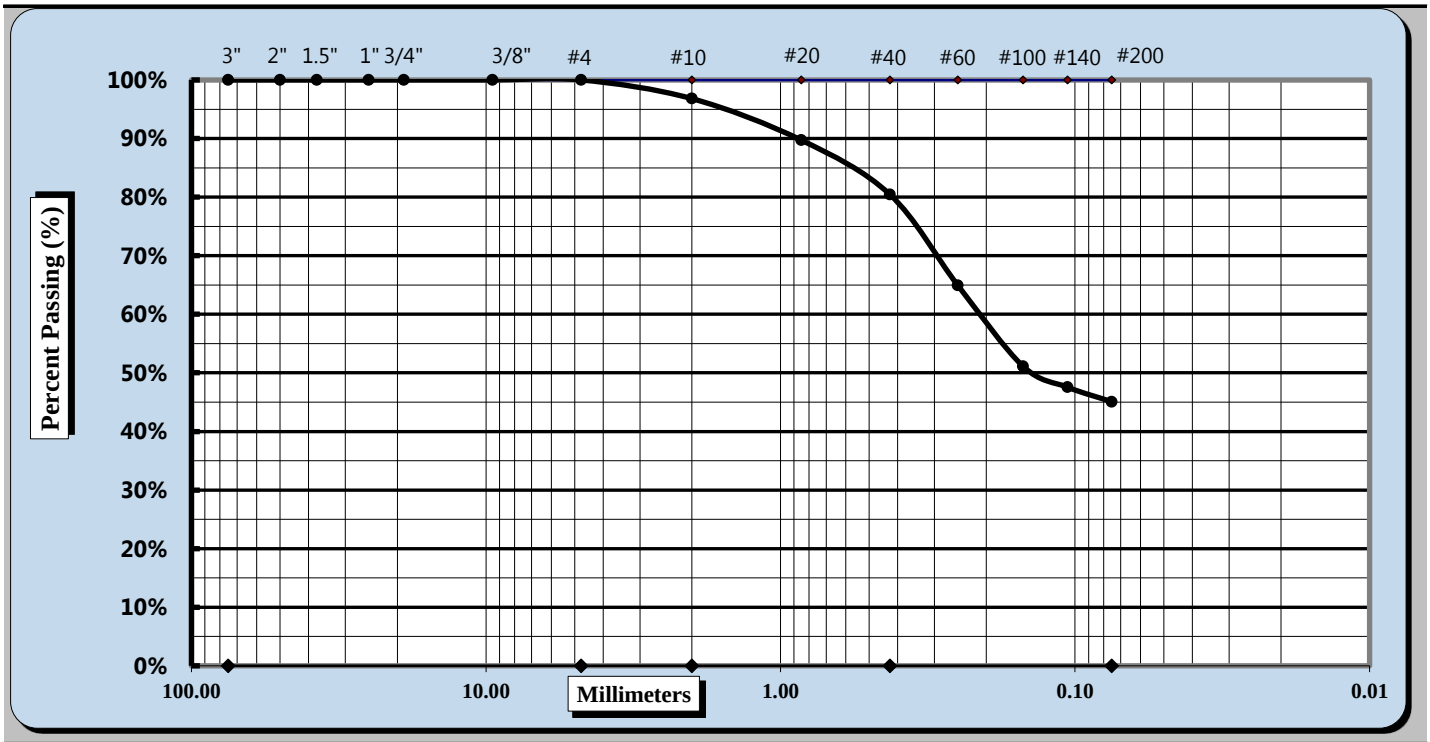
Form No TR-D6913-GR-01
Revision No. 1
Revision Date: 9/5/17

SIEVE ANALYSIS OF SOIL

Single sieve set ASTM D6913

S&ME, Inc. Raleigh: 3201 Spring Forest Road, Raleigh, NC 27616

Project #:	1305-18-083	Record Date:	7/19/2018
Project Name:	HDD Main Crossing I-95	Lab Report #:	1
Client Name:		Date Received:	7/19/2018
Received By:	Lab Tech	Sampled by: Driller	Date Sampled: 7/18/2018
Location:	Site-Borehole	Boring #: B-1	Sample #: SS-2
Log/Sample Id.	2237	Type: Split Spoon	Elev/Depth (ft): 3.5-5 ft.
Sample Description:	Red Tan Clayey SAND		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Method: B Procedure for obtaining Specimen: Moist

Maximum Particle Size	#4	Coarse Sand	3.2%	Fine Sand	35.4%
Gravel	0.0%	Medium Sand	16.4%	Silt & Clay	45.1%
Liquid Limit	ND	Plastic Limit	ND	Plastic Index	ND
Maximum Dry Density	ND	Bulk Gravity (C127)	N/A	% Absorption	N/A
Optimum Moisture	ND	Natural Moisture	14.8%		

Notes / Deviations / References: ND=Not Determined.

Mal Krajan, ET		Laboratory Manager	8/8/2018
Technical Responsibility	*Signature*	*Position*	*Date*

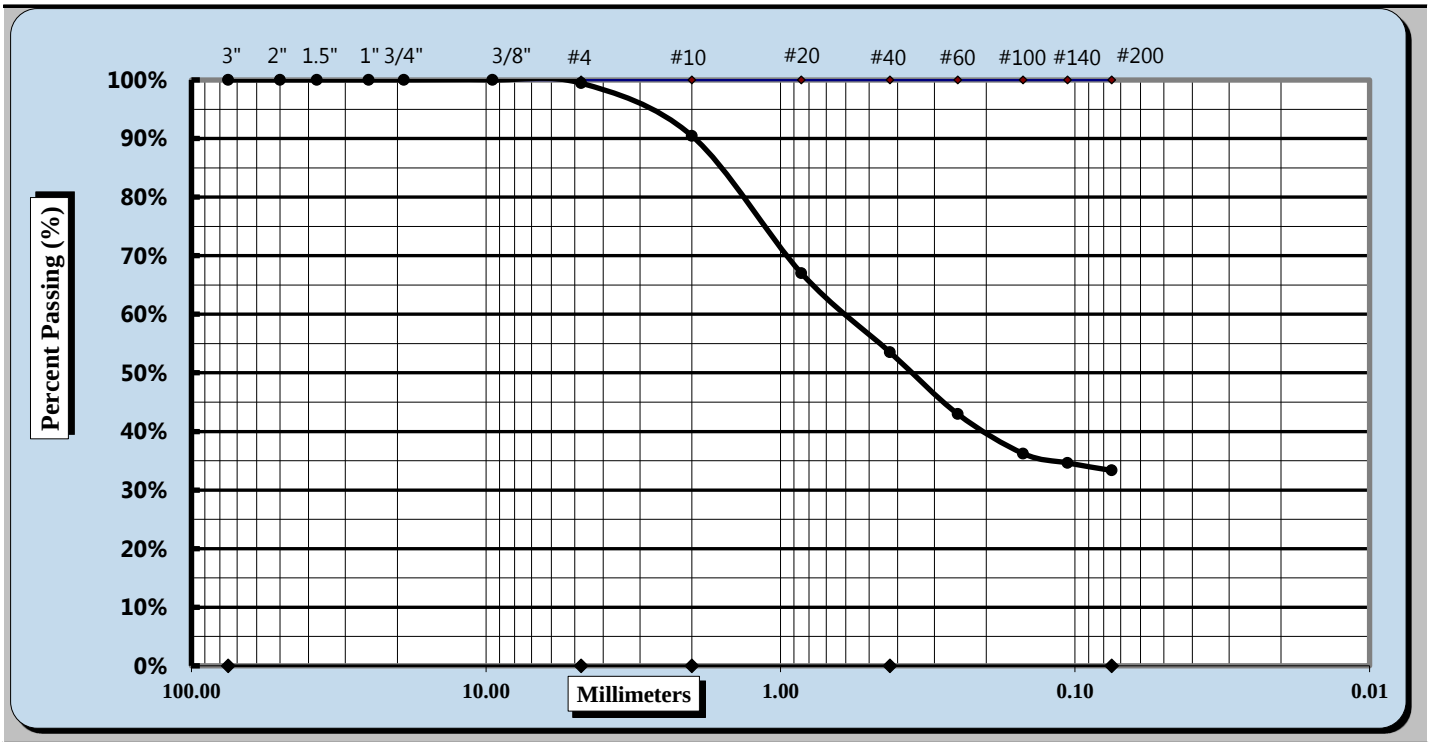
Form No TR-D6913-GR-01
Revision No. 1
Revision Date: 9/5/17

SIEVE ANALYSIS OF SOIL

Single sieve set ASTM D6913

S&ME, Inc. Raleigh: 3201 Spring Forest Road, Raleigh, NC 27616

Project #:	1305-18-083	Record Date:	7/19/2018
Project Name:	HDD Main Crossing I-95	Lab Report #:	1
Client Name:		Date Received:	7/19/2018
Received By:	Lab Tech	Sampled by: Driller	Date Sampled: 7/18/2018
Location:	Site-Borehole	Boring #: B-1	Sample #: SS-3
Log/Sample Id.	2237	Type: Split Spoon	Elev/Depth (ft): 6-7.5 ft.
Sample Description:	Gray Red Clayey SAND		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Method: B Procedure for obtaining Specimen: Moist

Maximum Particle Size	3/8"	Coarse Sand	9.0%	Fine Sand	20.2%
Gravel	0.6%	Medium Sand	36.9%	Silt & Clay	33.3%
Liquid Limit	ND	Plastic Limit	ND	Plastic Index	ND
Maximum Dry Density	ND	Bulk Gravity (C127)	N/A	% Absorption	N/A
Optimum Moisture	ND	Natural Moisture	13.4%		

Notes / Deviations / References: ND=Not Determined.

Mal Krajan, ET		Laboratory Manager	8/8/2018
Technical Responsibility	*Signature*	*Position*	*Date*

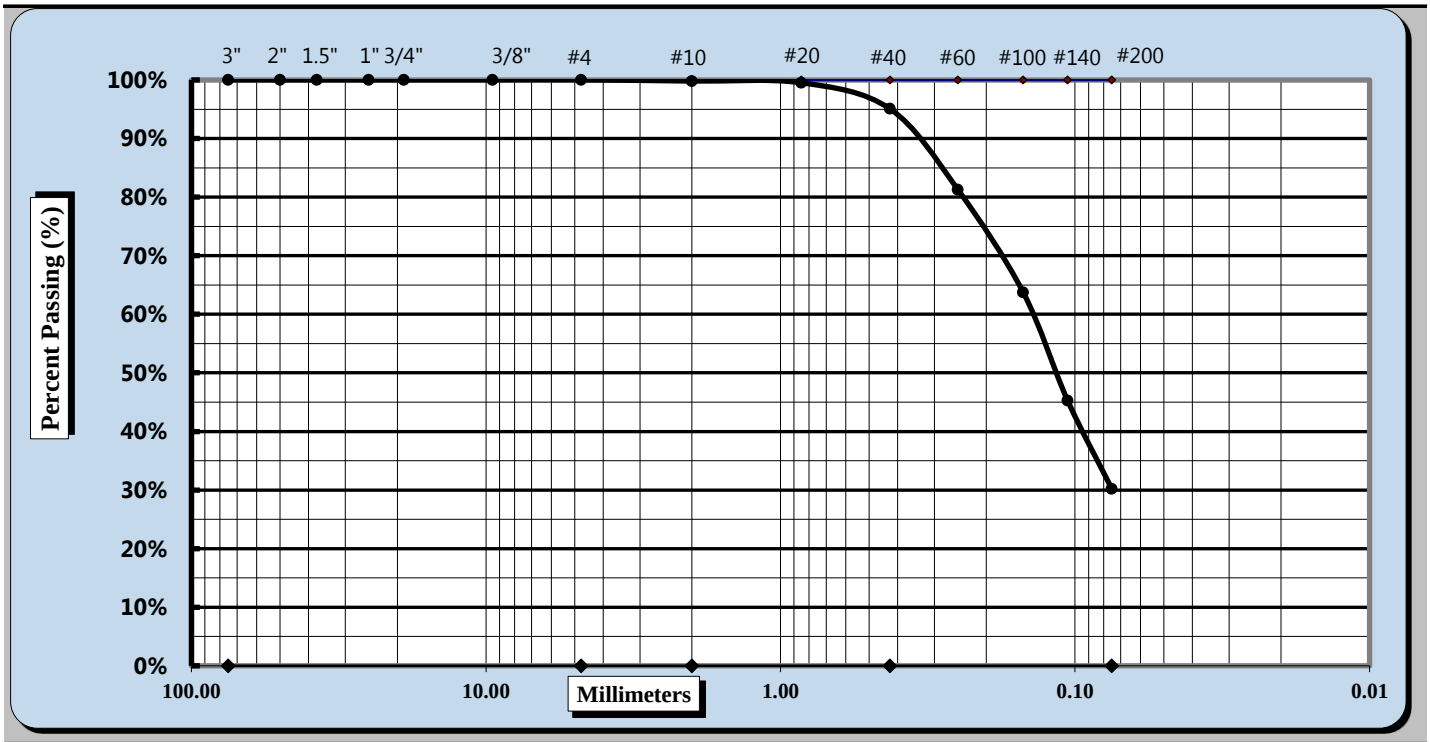
Form No TR-D6913-GR-01
Revision No. 1
Revision Date: 9/5/17

SIEVE ANALYSIS OF SOIL

Single sieve set ASTM D6913

S&ME, Inc. Raleigh: 3201 Spring Forest Road, Raleigh, NC 27616

Project #:	1305-18-083	Record Date:	7/19/2018
Project Name:	HDD Main Crossing I-95	Lab Report #:	1
Client Name:		Date Received:	7/19/2018
Received By:	Lab Tech	Sampled by: Driller	Date Sampled: 7/18/2018
Location:	Site-Borehole	Boring #: B-1	Sample #: SS-6
Log/Sample Id.	2237	Type: Split Spoon	Elev/Depth (ft): 18.5-20 ft.
Sample Description:	Orange Tan Silty SAND		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Method: B Procedure for obtaining Specimen: Moist

Maximum Particle Size	#4	Coarse Sand	0.2%	Fine Sand	64.9%
Gravel	0.0%	Medium Sand	4.7%	Silt & Clay	30.2%
Liquid Limit	ND	Plastic Limit	ND	Plastic Index	ND
Maximum Dry Density	ND	Bulk Gravity (C127)	N/A	% Absorption	N/A
Optimum Moisture	ND	Natural Moisture	40.1%		

Notes / Deviations / References: ND=Not Determined.

Mal Krajan, ET		Laboratory Manager	8/8/2018
Technical Responsibility	*Signature*	*Position*	*Date*

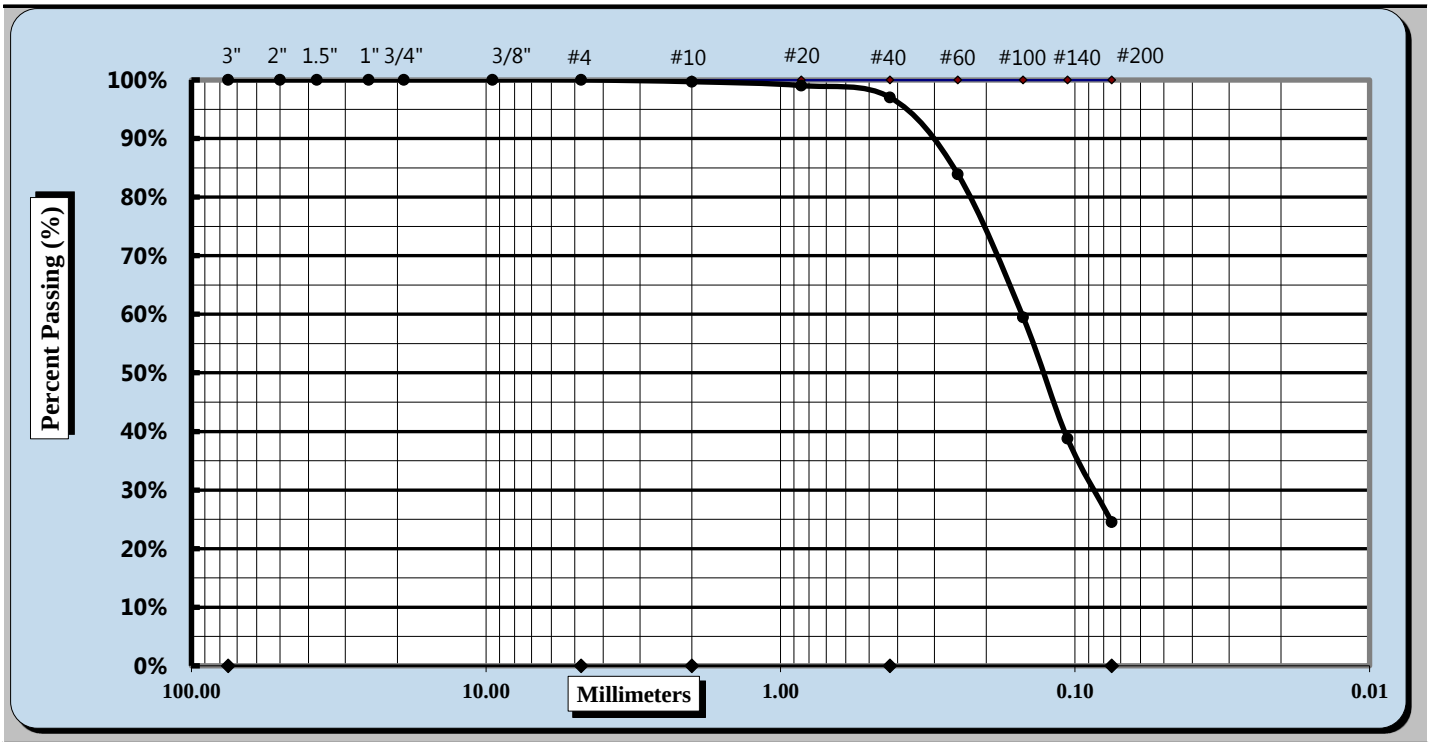
Form No TR-D6913-GR-01
Revision No. 1
Revision Date: 9/5/17

SIEVE ANALYSIS OF SOIL

Single sieve set ASTM D6913

S&ME, Inc. Raleigh: 3201 Spring Forest Road, Raleigh, NC 27616

Project #:	1305-18-083	Record Date:	7/19/2018
Project Name:	HDD Main Crossing I-95	Lab Report #:	1
Client Name:		Date Received:	7/19/2018
Received By:	Lab Tech	Sampled by: Driller	Date Sampled: 7/18/2018
Location:	Site-Borehole	Boring #: B-1	Sample #: SS-8
Log/Sample Id.	2237	Type: Split Spoon	Elev/Depth (ft): 28.5-30 ft.
Sample Description:	Tan Silty SAND		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Method: B Procedure for obtaining Specimen: Moist

Maximum Particle Size	#4	Coarse Sand	0.3%	Fine Sand	72.5%
Gravel	0.0%	Medium Sand	2.7%	Silt & Clay	24.5%
Liquid Limit	ND	Plastic Limit	ND	Plastic Index	ND
Maximum Dry Density	ND	Bulk Gravity (C127)	N/A	% Absorption	N/A
Optimum Moisture	ND	Natural Moisture	31.6%		

Notes / Deviations / References: ND=Not Determined.

Mal Krajan, ET		Laboratory Manager	8/8/2018
Technical Responsibility	*Signature*	*Position*	*Date*

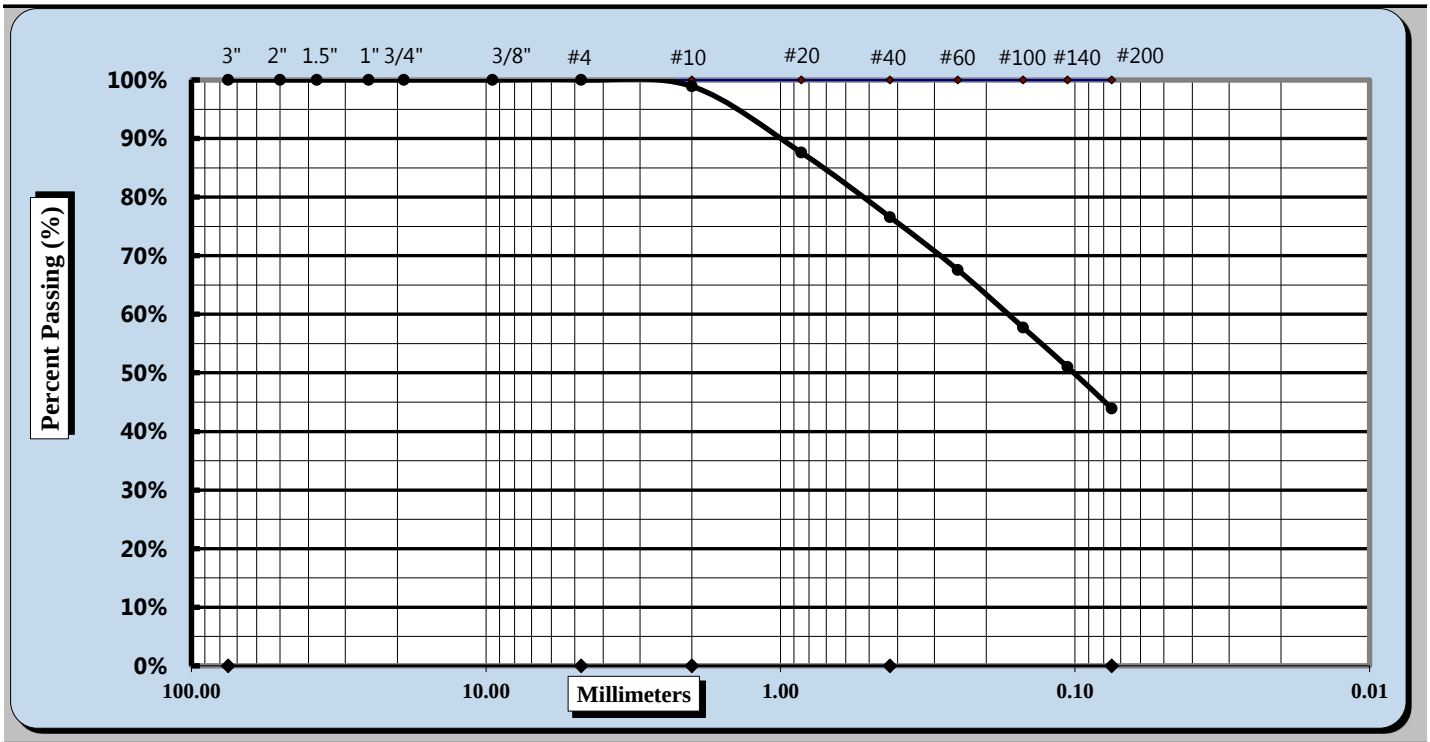
Form No TR-D6913-GR-01
Revision No. 1
Revision Date: 9/5/17

SIEVE ANALYSIS OF SOIL

Single sieve set ASTM D6913

S&ME, Inc. Raleigh: 3201 Spring Forest Road, Raleigh, NC 27616

Project #:	1305-18-083	Record Date:	7/19/2018
Project Name:	HDD Main Crossing I-95	Lab Report #:	1
Client Name:		Date Received:	7/19/2018
Received By:	Lab Tech	Sampled by: Driller	Date Sampled: 7/18/2018
Location:	Site-Borehole	Boring #: B-1	Sample #: SS-10
Log/Sample Id.	2237	Type: Split Spoon	Elev/Depth (ft): 38.5-40 ft.
Sample Description:	Pink Brown Silty SAND		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Method: B Procedure for obtaining Specimen: Moist

Maximum Particle Size	#4	Coarse Sand	1.1%	Fine Sand	32.7%
Gravel	0.0%	Medium Sand	22.3%	Silt & Clay	43.9%
Liquid Limit	ND	Plastic Limit	ND	Plastic Index	ND
Maximum Dry Density	ND	Bulk Gravity (C127)	N/A	% Absorption	N/A
Optimum Moisture	ND	Natural Moisture	41.5%		

Notes / Deviations / References: ND=Not Determined.

Mal Krajan, ET		Laboratory Manager	8/8/2018
Technical Responsibility	*Signature*	*Position*	*Date*

Form No. TR-D4318-T89-90
Revision No.
Revision Date: 8/28/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. Raleigh: 3201 Spring Forest Road, Raleigh, NC 27616

Project #:	1305-18-083	Report Date:	8/8/18
Project Name:	HDD Main Crossing I-95	Test Date(s)	7/27 - 8/8/18
Client Name:			
Client Address:			

Boring #:	B-2	Sample #: SS-1		Sample Date: 7/18/18	
Location:	Site-Borehole	Offset: N/A		Depth (ft): 1 - 2.5 ft.	
Sample Description:	Brown SILT with Sand				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	20977	4/9/2018	Grooving tool	S-1	5/18/2018
LL Apparatus	1803	7/5/2018			
Oven	1454	11/21/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:									
A	Tare Weight	20.83	20.60	21.29				13.68	21.07	
B	Wet Soil Weight + A	30.80	31.94	33.11				23.73	29.10	
C	Dry Soil Weight + A	27.50	28.00	28.91				21.31	27.19	
D	Water Weight (B-C)	3.30	3.94	4.20				2.42	1.91	
E	Dry Soil Weight (C-A)	6.67	7.40	7.62				7.63	6.12	
F	% Moisture (D/E)*100	49.5%	53.2%	55.1%				31.7%	31.2%	
N	# OF DROPS	35	22	17				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**31.5%**		

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	**52**
Plastic Limit	**32**
Plastic Index	**20**
Group Symbol	**MH**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☐ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* 6%

Notes / Deviations / References:

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Mal Krajan, ET		Laboratory Manager	8/8/2018
Technical Responsibility	*Signature*	*Position*	*Date*

Form No. TR-D4318-T89-90
Revision No.
Revision Date: 8/28/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

S&ME, Inc. Raleigh: 3201 Spring Forest Road, Raleigh, NC 27616

Project #:	1305-18-083	Report Date:	8/8/18
Project Name:	HDD Main Crossing I-95	Test Date(s)	7/27 - 8/8/18
Client Name:			
Client Address:			

Boring #:	B-2	Sample #: SS-3		Sample Date: 7/18/18	
Location:	Site-Borehole	Offset: N/A		Depth (ft): 6 - 7.5 ft.	
Sample Description:	Tan Red SILT with Sand				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	20977	4/9/2018	Grooving tool	S-1	5/18/2018
LL Apparatus	1803	7/5/2018			
Oven	1454	11/21/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:									
A	Tare Weight	13.47	16.74	11.12				15.27	16.78	
B	Wet Soil Weight + A	25.24	29.78	21.74				24.61	26.96	
C	Dry Soil Weight + A	20.79	24.60	17.48				21.68	23.75	
D	Water Weight (B-C)	4.45	5.18	4.26				2.93	3.21	
E	Dry Soil Weight (C-A)	7.32	7.86	6.36				6.41	6.97	
F	% Moisture (D/E)*100	60.8%	65.9%	67.0%				45.7%	46.1%	
N	# OF DROPS	35	23	20				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**45.9%**		

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	**65**
Plastic Limit	**46**
Plastic Index	**19**
Group Symbol	**MH**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☐ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* 11%

Notes / Deviations / References:

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Mal Krajan, ET		Laboratory Manager	8/8/2018
Technical Responsibility	*Signature*	*Position*	*Date*

Form No. TR-D4318-T89-90
Revision No.
Revision Date: 8/28/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

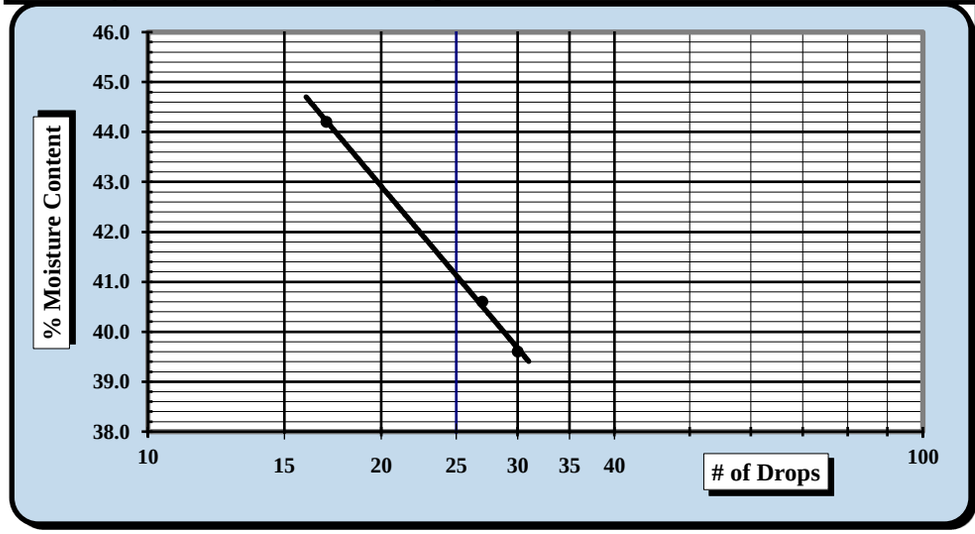
S&ME, Inc. Raleigh: 3201 Spring Forest Road, Raleigh, NC 27616

Project #:	1305-18-083	Report Date:	8/8/18
Project Name:	HDD Main Crossing I-95	Test Date(s)	7/27 - 8/8/18
Client Name:			
Client Address:			

Boring #:	B-2	Sample #: SS-6		Sample Date: 7/18/18	
Location:	Site-Borehole	Offset: N/A		Depth (ft): 18.5 - 20 ft.	
Sample Description:	Red Silty SAND				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	20977	4/9/2018	Grooving tool	S-1	5/18/2018
LL Apparatus	1803	7/5/2018			
Oven	1454	11/21/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:									
A	Tare Weight	21.14	13.64	16.70				13.50	20.99	
B	Wet Soil Weight + A	35.49	27.45	28.47				21.75	28.19	
C	Dry Soil Weight + A	31.42	23.46	24.86				19.46	26.22	
D	Water Weight (B-C)	4.07	3.99	3.61				2.29	1.97	
E	Dry Soil Weight (C-A)	10.28	9.82	8.16				5.96	5.23	
F	% Moisture (D/E)*100	39.6%	40.6%	44.2%				38.4%	37.7%	
N	# OF DROPS	30	27	17				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**38.1%**		



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	**41**
Plastic Limit	**38**
Plastic Index	**3**
Group Symbol	**SM**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☐ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* 15%

Notes / Deviations / References:

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Mal Krajan, ET		Laboratory Manager	8/8/2018
Technical Responsibility	*Signature*	*Position*	*Date*

Form No. TR-D4318-T89-90
Revision No.
Revision Date: 8/28/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

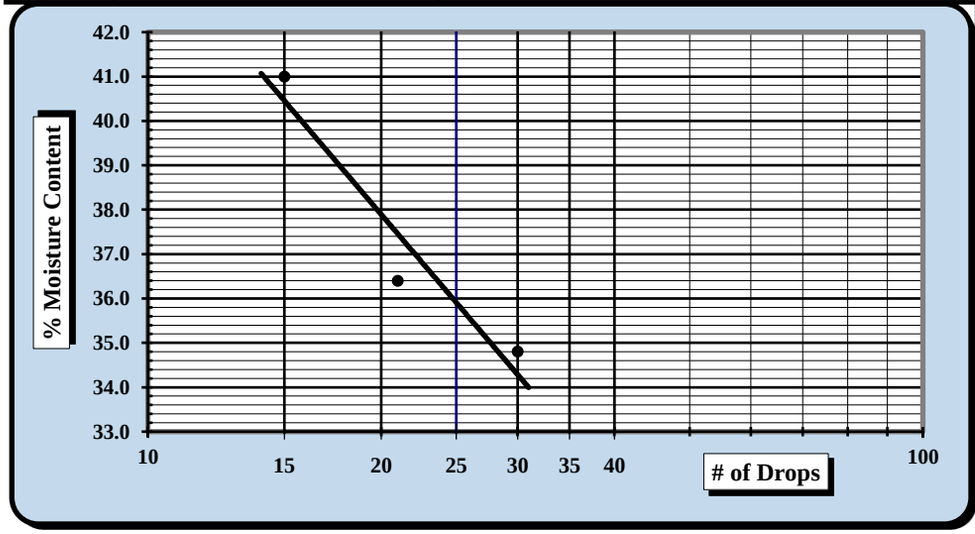
S&ME, Inc. Raleigh: 3201 Spring Forest Road, Raleigh, NC 27616

Project #:	1305-18-083	Report Date:	8/8/18
Project Name:	HDD Main Crossing I-95	Test Date(s)	7/27 - 8/8/18
Client Name:			
Client Address:			

Boring #:	B-2	Sample #: SS-8		Sample Date: 7/18/18	
Location:	Site-Borehole	Offset: N/A		Depth (ft): 28.5 - 30 ft.	
Sample Description:	Red Brown Silty SAND				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	20977	4/9/2018	Grooving tool	S-1	5/18/2018
LL Apparatus	1803	7/5/2018			
Oven	1454	11/21/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:									
A	Tare Weight	16.72	11.01	13.52				21.00	13.75	
B	Wet Soil Weight + A	28.88	22.89	26.51				28.80	22.36	
C	Dry Soil Weight + A	25.74	19.72	22.73				26.78	20.11	
D	Water Weight (B-C)	3.14	3.17	3.78				2.02	2.25	
E	Dry Soil Weight (C-A)	9.02	8.71	9.21				5.78	6.36	
F	% Moisture (D/E)*100	34.8%	36.4%	41.0%				34.9%	35.4%	
N	# OF DROPS	30	21	15				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**35.2%**		



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	**36**
Plastic Limit	**35**
Plastic Index	**1**
Group Symbol	**SM**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☐ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* 23%

Notes / Deviations / References:

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Mal Krajan, ET		Laboratory Manager	8/8/2018
Technical Responsibility	*Signature*	*Position*	*Date*

Form No. TR-D4318-T89-90
Revision No.
Revision Date: 8/28/17

LIQUID LIMIT, PLASTIC LIMIT, & PLASTIC INDEX

ASTM D 4318 ☒ AASHTO T 89 ☐ AASHTO T 90 ☐

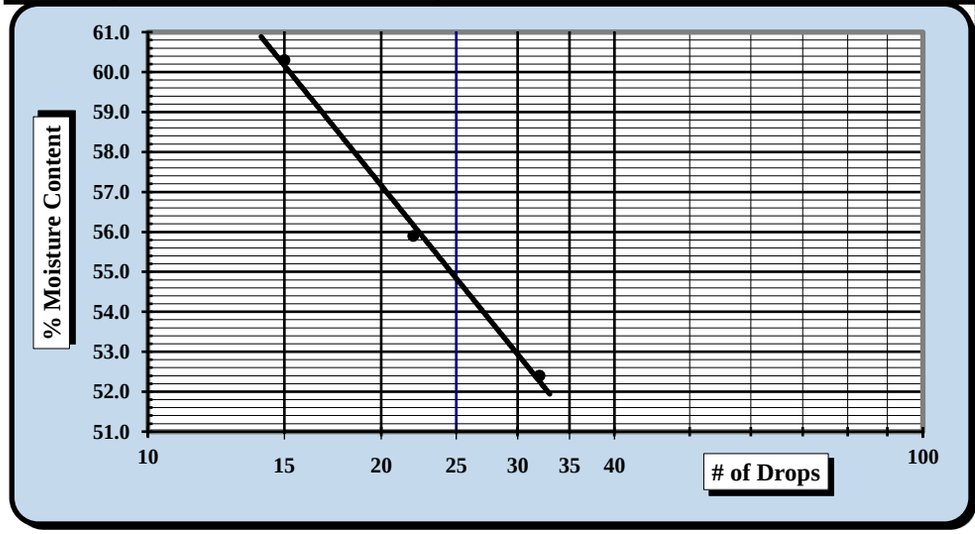
S&ME, Inc. Raleigh: 3201 Spring Forest Road, Raleigh, NC 27616

Project #:	1305-18-083	Report Date:	8/8/18
Project Name:	HDD Main Crossing I-95	Test Date(s)	7/27 - 8/8/18
Client Name:			
Client Address:			

Boring #:	B-2	Sample #: SS-9		Sample Date: 7/18/18	
Location:	Site-Borehole	Offset: N/A		Depth (ft): 33.5 - 35 ft.	
Sample Description:	Red Brown Silty SAND				

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.01 g)	20977	4/9/2018	Grooving tool	S-1	5/18/2018
LL Apparatus	1803	7/5/2018			
Oven	1454	11/21/2017			

Pan #		Liquid Limit						Plastic Limit		
	Tare #:									
A	Tare Weight	20.99	15.32	11.12				20.79	11.02	
B	Wet Soil Weight + A	33.15	27.31	22.68				32.15	20.10	
C	Dry Soil Weight + A	28.97	23.01	18.33				28.39	16.94	
D	Water Weight (B-C)	4.18	4.30	4.35				3.76	3.16	
E	Dry Soil Weight (C-A)	7.98	7.69	7.21				7.60	5.92	
F	% Moisture (D/E)*100	52.4%	55.9%	60.3%				49.5%	53.4%	
N	# OF DROPS	32	22	15				*Moisture Contents determined by ASTM D 2216*		
LL	LL = **F** * FACTOR									
Ave.	*Average*							**51.5%**		



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	**52**
Plastic Index	**3**
Group Symbol	**SM**

Multipoint Method ☑
One-point Method ☐

Wet Preparation ☐ Dry Preparation ☐ Air Dried ☑ *Estimate the % Retained on the #40 Sieve:* 27%

Notes / Deviations / References:

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

Mal Krajan, ET		Laboratory Manager	8/8/2018
Technical Responsibility	*Signature*	*Position*	*Date*

STANDARD SPECIAL PROVISION
AVAILABILITY OF FUNDS – TERMINATION OF CONTRACTS

(5-20-08) Z-2

General Statute 143C-6-11. (h) Highway Appropriation is hereby incorporated verbatim in this contract as follows:

(h) Amounts Encumbered. – Transportation project appropriations may be encumbered in the amount of allotments made to the Department of Transportation by the Director for the estimated payments for transportation project contract work to be performed in the appropriation fiscal year. The allotments shall be multiyear allotments and shall be based on estimated revenues and shall be subject to the maximum contract authority contained in *General Statute 143C-6-11(c)*. Payment for transportation project work performed pursuant to contract in any fiscal year other than the current fiscal year is subject to appropriations by the General Assembly. Transportation project contracts shall contain a schedule of estimated completion progress, and any acceleration of this progress shall be subject to the approval of the Department of Transportation provided funds are available. The State reserves the right to terminate or suspend any transportation project contract, and any transportation project contract shall be so terminated or suspended if funds will not be available for payment of the work to be performed during that fiscal year pursuant to the contract. In the event of termination of any contract, the contractor shall be given a written notice of termination at least 60 days before completion of scheduled work for which funds are available. In the event of termination, the contractor shall be paid for the work already performed in accordance with the contract specifications.

Payment will be made on any contract terminated pursuant to the special provision in accordance with Subarticle 108-13(D) of the *2018 Standard Specifications*.

STANDARD SPECIAL PROVISION
NCDOT GENERAL SEED SPECIFICATION FOR SEED QUALITY

(5-17-11) Z-3

Seed shall be sampled and tested by the North Carolina Department of Agriculture and Consumer Services, Seed Testing Laboratory. When said samples are collected, the vendor shall supply an independent laboratory report for each lot to be tested. Results from seed so sampled shall be final. Seed not meeting the specifications shall be rejected by the Department of Transportation and shall not be delivered to North Carolina Department of Transportation warehouses. If seed has been delivered it shall be available for pickup and replacement at the supplier's expense.

Any re-labeling required by the North Carolina Department of Agriculture and Consumer Services, Seed Testing Laboratory, that would cause the label to reflect as otherwise specified herein shall be rejected by the North Carolina Department of Transportation.

Seed shall be free from seeds of the noxious weeds Johnsongrass, Balloonvine, Jimsonweed, Witchweed, Itchgrass, Serrated Tussock, Showy Crotalaria, Smooth Crotalaria, Sicklepod, Sandbur, Wild Onion, and Wild Garlic. Seed shall not be labeled with the above weed species on the seed analysis label. Tolerances as applied by the Association of Official Seed Analysts will NOT be allowed for the above noxious weeds except for Wild Onion and Wild Garlic.

Tolerances established by the Association of Official Seed Analysts will generally be recognized. However, for the purpose of figuring pure live seed, the found pure seed and found germination percentages as reported by the North Carolina Department of Agriculture and Consumer Services, Seed Testing Laboratory will be used. Allowances, as established by the NCDOT, will be recognized for minimum pure live seed as listed on the following pages.

The specifications for restricted noxious weed seed refers to the number per pound as follows:

Restricted Noxious **Weed**	Limitations per Lb. Of Seed	Restricted Noxious **Weed**	Limitations per Lb. of Seed
Blessed Thistle	4 seeds	Cornflower (Ragged Robin)	27 seeds
Cocklebur	4 seeds	Texas Panicum	27 seeds
Spurred Anoda	4 seeds	Bracted Plantain	54 seeds
Velvetleaf	4 seeds	Buckhorn Plantain	54 seeds
Morning-glory	8 seeds	Broadleaf Dock	54 seeds
Corn Cockle	10 seeds	Curly Dock	54 seeds
Wild Radish	12 seeds	Dodder	54 seeds
Purple Nutsedge	27 seeds	Giant Foxtail	54 seeds
Yellow Nutsedge	27 seeds	Horsenettle	54 seeds
Canada Thistle	27 seeds	Quackgrass	54 seeds
Field Bindweed	27 seeds	Wild Mustard	54 seeds
Hedge Bindweed	27 seeds		

Seed of Pensacola Bahiagrass shall not contain more than 7% inert matter, Kentucky Bluegrass, Centipede and Fine or Hard Fescue shall not contain more than 5% inert matter whereas a maximum of 2% inert matter will be allowed on all other kinds of seed. In addition, all seed shall not contain more than 2% other crop seed nor more than 1% total weed seed. The germination rate as tested by the North Carolina Department of Agriculture shall not fall below 70%, which

includes both dormant and hard seed. Seed shall be labeled with not more than 7%, 5% or 2% inert matter (according to above specifications), 2% other crop seed and 1% total weed seed.

Exceptions may be made for minimum pure live seed allowances when cases of seed variety shortages are verified. Pure live seed percentages will be applied in a verified shortage situation. Those purchase orders of deficient seed lots will be credited with the percentage that the seed is deficient.

FURTHER SPECIFICATIONS FOR EACH SEED GROUP ARE GIVEN BELOW:

Minimum 85% pure live seed; maximum 1% total weed seed; maximum 2% total other crop seed; maximum 144 restricted noxious weed seed per pound. Seed less than 83% pure live seed will not be approved.

Sericea Lespedeza
Oats (seeds)

Minimum 80% pure live seed; maximum 1% total weed seed; maximum 2% total other crop; maximum 144 restricted noxious weed seed per pound. Seed less than 78% pure live seed will not be approved.

Tall Fescue (all approved varieties)
Kobe Lespedeza
Korean Lespedeza
Weeping Lovegrass
Carpetgrass
Bermudagrass
Browntop Millet
German Millet – Strain R
Clover – Red/White/Crimson

Minimum 78% pure live seed; maximum 1% total weed seed; maximum 2% total other crop seed; maximum 144 restricted noxious weed seed per pound. Seed less than 76% pure live seed will not be approved.

Common or Sweet Sundangrass

Minimum 76% pure live seed; maximum 1% total weed seed; maximum 2% total other crop seed; maximum 144 restricted noxious weed seed per pound. Seed less than 74% pure live seed will not be approved.

Rye (grain; all varieties)
Kentucky Bluegrass (all approved varieties)
Hard Fescue (all approved varieties)
Shrub (bicolor) Lespedeza

Minimum 70% pure live seed; maximum 1% total weed seed; maximum 2% total other crop seed; maximum 144 noxious weed seed per pound. Seed less than 70% pure live seed will not be approved.

Centipedegrass
Crownvetch
Pensacola Bahiagrass
Creeping Red Fescue
Japanese Millet
Reed Canary Grass
Zoysia

Minimum 70% pure live seed; maximum 1% total weed seed; maximum 2% total other crop seed; maximum 5% inert matter; maximum 144 restricted noxious weed seed per pound.

Barnyard Grass
Big Bluestem
Little Bluestem
Bristly Locust
Birdsfoot Trefoil
Indiangrass
Orchardgrass
Switchgrass
Yellow Blossom Sweet Clover

STANDARD SPECIAL PROVISION

ERRATA

(10-16-18) (Rev.1-15-19) Z-4

Revise the *2018 Standard Specifications* as follows:

Division 6

Page 6-7, Article 609-1 DESCRIPTION, line 29, replace article number "609-10" with "609-9".

Division 7

Page 7-27, Article 725-1 MEASUREMENT AND PAYMENT, line 4, replace article number "725-1" with "724-4".

Page 7-28, Article 725-1 MEASUREMENT AND PAYMENT, line 10, replace article number "725-1" with "725-3".

Division 10

Page 10-78, Article 1056-4 GEOTEXTILES, TABLE 1056-1, Permittivity, Type 2, replace "Table 6[D]" with "Table 7[D]" and **Permittivity, Type 3[B],** replace "Table 7[D]" with "Table 8[D]".

Page 10-162, Article 1080-50 PAINT FOR VERTICAL MARKERS, line 1, replace article number "1080-50" with "1080-10".

Page 10-162, Article 1080-61 EPOXY RESIN FOR REINFORCING STEEL, line 5, replace article number "1080-61" with "1080-11".

Page 10-162, Article 1080-72 ABRASIVE MATERIALS FOR BLAST CLEANING STEEL, line 22, replace article number "1080-72" with "1080-12".

Page 10-163, Article 1080-83 FIELD PERFORMANCE AND SERVICES, line 25, replace article number "1080-83" with "1080-13".

Division 17

Page 17-15, Article 1715-4 MEASUREMENT AND PAYMENT, lines 42-44, replace the second sentence with the following:

An example is an installation of a single 1.25 inch HDPE conduit would be paid as:

Directional Drill (1)(1.25″) Linear Foot

STANDARD SPECIAL PROVISION

PLANT AND PEST QUARANTINES
(Imported Fire Ant, Gypsy Moth, Witchweed, Emerald Ash Borer, And Other Noxious Weeds)

(3-18-03) (Rev. 12-20-16) Z-04a

Within Quarantined Area

This project may be within a county regulated for plant and/or pests. If the project or any part of the Contractor's operations is located within a quarantined area, thoroughly clean all equipment prior to moving out of the quarantined area. Comply with federal/state regulations by obtaining a certificate or limited permit for any regulated article moving from the quarantined area.

Originating in a Quarantined County

Obtain a certificate or limited permit issued by the N.C. Department of Agriculture/United States Department of Agriculture. Have the certificate or limited permit accompany the article when it arrives at the project site.

Contact

Contact the N.C. Department of Agriculture/United States Department of Agriculture at 1-800-206-9333, 919-707-3730, or *http://www.ncagr.gov/plantindustry/* to determine those specific project sites located in the quarantined area or for any regulated article used on this project originating in a quarantined county.

Regulated Articles Include

1. Soil, sand, gravel, compost, peat, humus, muck, and decomposed manure, separately or with other articles. This includes movement of articles listed above that may be associated with cut/waste, ditch pulling, and shoulder cutting.
2. Plants with roots including grass sod.
3. Plant crowns and roots.
4. Bulbs, corms, rhizomes, and tubers of ornamental plants.
5. Hay, straw, fodder, and plant litter of any kind.
6. Clearing and grubbing debris.
7. Used agricultural cultivating and harvesting equipment.
8. Used earth-moving equipment.
9. Any other products, articles, or means of conveyance, of any character, if determined by an inspector to present a hazard of spreading imported fire ant, gypsy moth, witchweed, emerald ash borer, or other noxious weeds.

STANDARD SPECIAL PROVISION

MINIMUM WAGES

(7-21-09) Z-5

FEDERAL: The Fair Labor Standards Act provides that with certain exceptions every employer shall pay wages at the rate of not less than SEVEN DOLLARS AND TWENTY FIVE CENTS ($7.25) per hour.

STATE: The North Carolina Minimum Wage Act provides that every employer shall pay to each of his employees, wages at a rate of not less than SEVEN DOLLARS AND TWENTY FIVE CENTS ($7.25) per hour.

The minimum wage paid to all skilled labor employed on this contract shall be SEVEN DOLLARS AND TWENTY FIVE CENTS ($7.25) per hour.

The minimum wage paid to all intermediate labor employed on this contract shall be SEVEN DOLLARS AND TWENTY FIVE CENTS ($7.25) per hour.

The minimum wage paid to all unskilled labor on this contract shall be SEVEN DOLLARS AND TWENTY FIVE CENTS ($7.25) per hour.

This determination of the intent of the application of this act to the contract on this project is the responsibility of the Contractor.

The Contractor shall have no claim against the Department of Transportation for any changes in the minimum wage laws, Federal or State. It is the responsibility of the Contractor to keep fully informed of all Federal and State Laws affecting his contract.

STANDARD SPECIAL PROVISION

TITLE VI AND NONDISCRIMINATION:

(6-28-77)(Rev 6/19/2018) Z-6

Revise the *2018 Standard Specifications* as follows:

Replace Article 103-4(B) with the following:

The North Carolina Department of Transportation is committed to carrying out the U.S. Department of Transportation's policy of ensuring nondiscrimination in the award and administration of contracts.

The provisions of this section related to United States Department of Transportation (US DOT) Order 1050.2A, Title 49 Code of Federal Regulations (CFR) part 21, 23 United States Code (U.S.C.) 140 and 23 CFR part 200 (or 49 CFR 303, 49 U.S.C. 5332 or 49 U.S.C. 47123) are applicable to all North Carolina Department of Transportation (NCDOT) contracts and to all related subcontracts, material supply, engineering, architectural and other service contracts, regardless of dollar amount. Any Federal provision that is specifically required not specifically set forth is hereby incorporated by reference.

(1) **Title VI Assurances (USDOT Order 1050.2A, Appendix A)**

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

(a) Compliance with Regulations

The contractor (hereinafter includes consultants) shall comply with the Acts and the Regulations relative to Nondiscrimination in Federally-assisted programs of the U.S. Department of Transportation, Federal Highway Administration (FHWA), as they may be amended from time to time, which are herein incorporated by reference and made a part of this contract.

(b) Nondiscrimination

The contractor, with regard to the work performed by it during the contract, shall not discriminate on the grounds of race, color, or national origin in the selection and retention of subcontractors, including procurements of materials and leases of equipment. The contractor shall not participate directly or indirectly in the discrimination prohibited by the Acts and the Regulations, including employment practices when the contract covers any activity, project, or program set forth in Appendix B of 49 CFR Part 21.

(c) Solicitations for Subcontractors, Including Procurements of Materials and Equipment

In all solicitations, either by competitive bidding, or negotiation made by the contractor for work to be performed under a subcontract, including procurements of materials, or leases of equipment, each potential subcontractor or supplier shall be notified by the contractor of the contractor's obligations under this contract and the Acts and the Regulations relative to Nondiscrimination on the grounds of race, color, or national origin.

(d) Information and Reports

The contractor shall provide all information and reports required by the Acts, the Regulations, and directives issued pursuant thereto and shall permit access to its books, records, accounts, other sources of information, and its facilities as may be determined by the Recipient or the FHWA to be pertinent to ascertain compliance with such Acts, Regulations, and instructions. Where any information required of a contractor is in the

exclusive possession of another who fails or refuses to furnish the information, the contractor shall so certify to the Recipient or the FHWA, as appropriate, and shall set forth what efforts it has made to obtain the information.

(e) Sanctions for Noncompliance:
In the event of a contractor's noncompliance with the Non-discrimination provisions of this contract, the Recipient will impose such contract sanctions as it and/or the FHWA may determine to be appropriate, including, but not limited to:
(i) Withholding payments to the contractor under the contract until the contractor complies; and/or
(ii) Cancelling, terminating, or suspending a contract, in whole or in part.

(f) Incorporation of Provisions
The contractor shall include the provisions of paragraphs (a) through (f) in every subcontract, including procurements of materials and leases of equipment, unless exempt by the Acts, the Regulations and directives issued pursuant thereto. The contractor shall take action with respect to any subcontract or procurement as the Recipient or the FHWA may direct as a means of enforcing such provisions including sanctions for noncompliance. Provided, that if the contractor becomes involved in, or is threatened with litigation by a subcontractor, or supplier because of such direction, the contractor may request the Recipient to enter into any litigation to protect the interests of the Recipient. In addition, the contractor may request the United States to enter into the litigation to protect the interests of the United States.

(2) **Title VI Nondiscrimination Program (23 CFR 200.5(p))**
The North Carolina Department of Transportation (NCDOT) has assured the USDOT that, as a condition to receiving federal financial assistance, NCDOT will comply with Title VI of the Civil Rights Act of 1964 and all requirements imposed by Title 49 CFR part 21 and related nondiscrimination authorities to ensure that no person shall, on the ground of race, color, national origin, limited English proficiency, sex, age, or disability (including religion/creed or income-level, where applicable), be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any programs, activities, or services conducted or funded by NCDOT. Contractors and other organizations under contract or agreement with NCDOT must also comply with Title VI and related authorities, therefore:

(a) During the performance of this contract or agreement, contractors (e.g., subcontractors, consultants, vendors, prime contractors) are responsible for complying with NCDOT's Title VI Program. Contractors are not required to prepare or submit Title VI Programs. To comply with this section, the prime contractor shall:
1. Post NCDOT's Notice of Nondiscrimination and the Contractor's own Equal Employment Opportunity (EEO) Policy in conspicuous locations accessible to all employees, applicants and subcontractors on the jobsite.
2. Physically incorporate the required Title VI clauses into all subcontracts on federally-assisted and state-funded NCDOT projects, and ensure inclusion by subcontractors into all lower-tier subcontracts.
3. Required Solicitation Language. The Contractor shall include the following notification in all solicitations for bids and requests for work or material, regardless of funding source:
"The North Carolina Department of Transportation, in accordance with the provisions of Title VI of the Civil Rights Act of 1964 (78 Stat. 252, 42 US.C. §§ 2000d to 2000d-4) and the Regulations, hereby notifies all bidders that it will affirmatively ensure that any contract entered into pursuant to this advertisement, disadvantaged business enterprises will be afforded full and fair opportunity to

submit bids in response to this invitation and will not be discriminated against on the grounds of race, color, or national origin in consideration for an award. In accordance with other related nondiscrimination authorities, bidders and contractors will also not be discriminated against on the grounds of sex, age, disability, low-income level, creed/religion, or limited English proficiency in consideration for an award."

4. Physically incorporate the FHWA-1273, in its entirety, into all subcontracts and subsequent lower tier subcontracts on Federal-aid highway construction contracts only.
5. Provide language assistance services (i.e., written translation and oral interpretation), free of charge, to LEP employees and applicants. Contact NCDOT OCR for further assistance, if needed.
6. For assistance with these Title VI requirements, contact the NCDOT Title VI Nondiscrimination Program at 1-800-522-0453.

(b) Subrecipients (e.g. cities, counties, LGAs, planning organizations) may be required to prepare and submit a Title VI Plan to NCDOT, including Title VI Assurances and/or agreements. Subrecipients must also ensure compliance by their contractors and subrecipients with Title VI. (23 CFR 200.9(b)(7))

(c) If reviewed or investigated by NCDOT, the contractor or subrecipient agrees to take affirmative action to correct any deficiencies found within a reasonable time period, not to exceed 90 calendar days, unless additional time is granted by NCDOT. (23 CFR 200.9(b)(15))

(d) The Contractor is responsible for notifying subcontractors of NCDOT's External Discrimination Complaints Process.

1. Applicability
   Title VI and related laws protect participants and beneficiaries (e.g., members of the public and contractors) from discrimination by NCDOT employees, subrecipients and contractors, regardless of funding source.
2. Eligibility
   Any person—or class of persons—who believes he/she has been subjected to discrimination based on race, color, national origin, Limited English Proficiency (LEP), sex, age, or disability (and religion in the context of employment, aviation, or transit) may file a written complaint. The law also prohibits intimidation or retaliation of any sort.
3. Time Limits and Filing Options
   Complaints may be filed by the affected individual(s) or a representative and must be filed no later than 180 calendar days after the following:
   (i) The date of the alleged act of discrimination; or
   (ii) The date when the person(s) became aware of the alleged discrimination; or
   (iii) Where there has been a continuing course of conduct, the date on which that conduct was discontinued or the latest instance of the conduct.

   Title VI and related discrimination complaints may be submitted to the following entities:
   - North Carolina Department of Transportation, Office of Civil Rights, Title VI Program, 1511 Mail Service Center, Raleigh, NC 27699-1511; toll free 1-800-522-0453
   - Federal Highway Administration, North Carolina Division Office, 310 New Bern Avenue, Suite 410, Raleigh, NC 27601, 919-747-7010

- US Department of Transportation, Departmental Office of Civil Rights, External Civil Rights Programs Division, 1200 New Jersey Avenue, SE, Washington, DC 20590; 202-366-4070

4. Format for Complaints
   Complaints must be in writing and signed by the complainant(s) or a representative, and include the complainant's name, address, and telephone number. Complaints received by fax or e-mail will be acknowledged and processed. Allegations received by telephone will be reduced to writing and provided to the complainant for confirmation or revision before processing. Complaints will be accepted in other languages, including Braille.
5. Discrimination Complaint Form
   Contact NCDOT Civil Rights to receive a full copy of the Discrimination Complaint Form and procedures.
6. Complaint Basis
   Allegations must be based on issues involving race, color, national origin (LEP), sex, age, disability, or religion (in the context of employment, aviation or transit). "Basis" refers to the complainant's membership in a protected group category.

TABLE 103-1
COMPLAINT BASIS

Protected Categories	Definition	Examples	Applicable Nondiscrimination Authorities
Race and Ethnicity	An individual belonging to one of the accepted racial groups; or the perception, based usually on physical characteristics that a person is a member of a racial group	Black/African American, Hispanic/Latino, Asian, American Indian/Alaska Native, Native Hawaiian/Pacific Islander, White	Title VI of the Civil Rights Act of 1964; 49 CFR Part 21; 23 CFR 200; 49 U.S.C. 5332(b); 49 U.S.C. 47123. *(Executive Order 13166)*
Color	Color of skin, including shade of skin within a racial group	Black, White, brown, yellow, etc.	
National Origin *(Limited English Proficiency)*	Place of birth. Citizenship is not a factor. (*Discrimination based on language or a person's accent is also covered)*	Mexican, Cuban, Japanese, Vietnamese, Chinese	
Sex	Gender. The sex of an individual. *Note:* Sex under this program does not include sexual orientation.	Women and Men	1973 Federal-Aid Highway Act; 49 U.S.C. 5332(b); 49 U.S.C. 47123.
Age	Persons of any age	21-year-old person	Age Discrimination Act of 1975 49 U.S.C. 5332(b); 49 U.S.C. 47123.
Disability	Physical or mental impairment, permanent or temporary, or perceived.	Blind, alcoholic, para-amputee, epileptic, diabetic, arthritic	Section 504 of the Rehabilitation Act of 1973; Americans with Disabilities Act of 1990

Religion (in the context of employment) *(Religion/ Creed in all aspects of any aviation or transit-related construction)*	An individual belonging to a religious group; or the perception, based on distinguishable characteristics that a person is a member of a religious group. In practice, actions taken as a result of the moral and ethical beliefs as to what is right and wrong, which are sincerely held with the strength of traditional religious views. ***Note:*** Does not have to be associated with a recognized religious group or church; if an individual sincerely holds to the belief, it is a protected religious practice.	Muslim, Christian, Sikh, Hindu, etc.	Title VII of the Civil Rights Act of 1964; 23 CFR 230; FHWA-1273 Required Contract Provisions. *(49 U.S.C. 5332(b);* *49 U.S.C. 47123)*

(3) **Pertinent Nondiscrimination Authorities**

During the performance of this contract, the contractor, for itself, its assignees, and successors in interest agrees to comply with the following non-discrimination statutes and authorities, including, but not limited to:

(a) Title VI of the Civil Rights Act of 1964 (42 U.S.C. § 2000d et seq., 78 stat. 252), (prohibits discrimination on the basis of race, color, national origin); and 49 CFR Part 21.

(b) The Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, (42 U.S.C. § 4601), (prohibits unfair treatment of persons displaced or whose property has been acquired because of Federal or Federal-aid programs and projects);

(c) Federal-Aid Highway Act of 1973, (23 U.S.C. § 324 et seq.), (prohibits discrimination on the basis of sex);

(d) Section 504 of the Rehabilitation Act of 1973, (29 U.S.C. § 794 et seq.), as amended, (prohibits discrimination on the basis of disability) and 49 CFR Part 27;

(e) The Age Discrimination Act of 1975, as amended, (42 U.S.C. § 6101 et seq.), (prohibits discrimination on the basis of age);

(f) Airport and Airway Improvement Act of 1982, (49 USC § 471, Section 47123), as amended, (prohibits discrimination based on race, creed, color, national origin, or sex);

(g) The Civil Rights Restoration Act of 1987, (PL 100-209), (Broadened the scope, coverage and applicability of Title VI of the Civil Rights Act of 1964, The Age Discrimination Act of 1975 and Section 504 of the Rehabilitation Act of 1973, by expanding the definition of the terms "programs or activities" to include all of the programs or activities of the Federal-aid recipients, sub-recipients and contractors, whether such programs or activities are Federally funded or not);

(h) Titles II and III of the Americans with Disabilities Act, which prohibit discrimination on the basis of disability in the operation of public entities, public and private transportation systems, places of public accommodation, and certain testing entities (42 U.S.C. §§ 12131-12189) as implemented by Department of Transportation regulations at 49 C.F.R. parts 37 and 38;

(i) The Federal Aviation Administration's Nondiscrimination statute (49 U.S.C. § 47123) (prohibits discrimination on the basis of race, color, national origin, and sex);

(j) Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, which ensures Nondiscrimination against minority populations by discouraging programs, policies, and activities with disproportionately high and adverse human health or environmental effects on minority and low-income populations;

(k) Executive Order 13166, Improving Access to Services for Persons with Limited English Proficiency, and resulting agency guidance, national origin discrimination includes discrimination because of Limited English proficiency (LEP). To ensure compliance with Title VI, you must take reasonable steps to ensure that LEP persons have meaningful access to your programs (70 Fed. Reg. at 74087 to 74100);

(l) Title IX of the Education Amendments of 1972, as amended, which prohibits you from discriminating because of sex in education programs or activities (20 U.S.C. 1681 et seq).

(m) Title VII of the Civil Rights Act of 1964 (42 U.S.C. § 2000e et seq., Pub. L. 88-352), (prohibits employment discrimination on the basis of race, color, religion, sex, or national origin).

(4) **Additional Title VI Assurances**

***The following Title VI Assurances (Appendices B, C and D) shall apply, as applicable*

(a) Clauses for Deeds Transferring United States Property (1050.2A, Appendix B)

The following clauses will be included in deeds effecting or recording the transfer of real property, structures, or improvements thereon, or granting interest therein from the United States pursuant to the provisions of Assurance 4.

NOW, THEREFORE, the U.S. Department of Transportation as authorized by law and upon the condition that the North Carolina Department of Transportation (NCDOT) will accept title to the lands and maintain the project constructed thereon in accordance with the North Carolina General Assembly, the Regulations for the Administration of the Federal-Aid Highway Program, and the policies and procedures prescribed by the Federal Highway Administration of the U.S. Department of Transportation in accordance and in compliance with all requirements imposed by Title 49, Code of Federal Regulations, U.S. Department of Transportation, Subtitle A, Office of the Secretary, Part 21, Nondiscrimination in Federally-assisted programs of the U.S Department of Transportation pertaining to and effectuating the provisions of Title VI of the Civil Rights Act of 1964 (78 Stat. 252; 42 U.S.C. § 2000d to 2000d-4), does hereby remise, release, quitclaim and convey unto the NCDOT all the right, title and interest of the U.S. Department of Transportation in and to said lands described in Exhibit A attached hereto and made a part hereof.

(HABENDUM CLAUSE)

TO HAVE AND TO HOLD said lands and interests therein unto the North Carolina Department of Transportation (NCDOT) and its successors forever, subject, however, to the covenants, conditions, restrictions and reservations herein contained as follows, which will remain in effect for the period during which the real property or structures are used for a purpose for which Federal financial assistance is extended or for another purpose involving the provision of similar services or benefits and will be binding on the NCDOT, its successors and assigns.

The NCDOT, in consideration of the conveyance of said lands and interests in lands, does hereby covenant and agree as a covenant running with the land for itself, its successors and assigns, that (1) no person will on the grounds of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be otherwise subjected to discrimination with regard to any facility located wholly or in part on, over, or under such lands hereby conveyed [,] [and]* (2) that the NCDOT will use the lands and interests in lands and interests in lands so conveyed, in compliance with all requirements imposed by or pursuant to Title 49, Code of Federal Regulations, U.S. Department of Transportation, Subtitle A, Office of the Secretary, Part 21, Non-discrimination in Federally-assisted programs of the U.S. Department of Transportation, Effectuation of Title VI of the Civil Rights Act of 1964, and as said Regulations and Acts may be amended [, and (3) that in the event of breach of any of the above-mentioned nondiscrimination conditions, the Department will have a right to enter or re-enter said lands and facilities on said land, and that above described land and facilities will thereon revert to and vest in and become the absolute property of the U.S. Department of Transportation and its assigns as such interest existed prior to this instruction].*

(*Reverter clause and related language to be used only when it is determined that such a clause is necessary in order to make clear the purpose of Title VI.)

(b) Clauses for Transfer of Real Property Acquired or Improved Under the Activity, Facility, or Program (1050.2A, Appendix C)

The following clauses will be included in deeds, licenses, leases, permits, or similar instruments entered into by the North Carolina Department of Transportation (NCDOT) pursuant to the provisions of Assurance 7(a):

1. The (grantee, lessee, permittee, etc. as appropriate) for himself/herself, his/her heirs, personal representatives, successors in interest, and assigns, as a part of the consideration hereof, does hereby covenant and agree [in the case of deeds and leases add "as a covenant running with the land"] that:
   (i.) In the event facilities are constructed, maintained, or otherwise operated on the property described in this (deed, license, lease, permit, etc.) for a purpose for which a U.S. Department of Transportation activity, facility, or program is extended or for another purpose involving the provision of similar services or benefits, the (grantee, licensee, lessee, permittee, etc.) will maintain and operate such facilities and services in compliance with all requirements imposed by the Acts and Regulations (as may be amended) such that no person on the grounds of race, color, or national origin, will be excluded from participation in, denied the benefits of, or be otherwise subjected to discrimination in the use of said facilities.
2. With respect to licenses, leases, permits, etc., in the event of breach of any of the above Nondiscrimination covenants, the NCDOT will have the right to terminate the (lease, license, permit, etc.) and to enter, re-enter, and repossess said lands and facilities thereon, and hold the same as if the (lease, license, permit, etc.) had never been made or issued. *
3. With respect to a deed, in the event of breach of any of the above Nondiscrimination covenants, the NCDOT will have the right to enter or re-enter the lands and facilities thereon, and the above described lands and facilities will there upon revert to and vest in and become the absolute property of the NCDOT and its assigns. *

(*Reverter clause and related language to be used only when it is determined that such a clause is necessary to make clear the purpose of Title VI.)

(c) Clauses for Construction/Use/Access to Real Property Acquired Under the Activity, Facility or Program (1050.2A, Appendix D)

The following clauses will be included in deeds, licenses, permits, or similar instruments/ agreements entered into by the North Carolina Department of Transportation (NCDOT) pursuant to the provisions of Assurance 7(b):

1. The (grantee, licensee, permittee, etc., as appropriate) for himself/herself, his/her heirs, personal representatives, successors in interest, and assigns, as a part of the consideration hereof, does hereby covenant and agree (in the case of deeds and leases add, "as a covenant running with the land") that (1) no person on the ground of race, color, or national origin, will be excluded from participation in, denied the benefits of, or be otherwise subjected to discrimination in the use of said facilities, (2) that in the construction of any improvements on, over, or under such land, and the furnishing of services thereon, no person on the ground of race, color, or national origin, will be excluded from participation in, denied the benefits of, or otherwise be subjected to discrimination, (3) that the (grantee, licensee, lessee, permittee, etc.) will use the premises in compliance with all other requirements imposed by or pursuant to the Acts and Regulations, as amended, set forth in this Assurance.
2. With respect to (licenses, leases, permits, etc.), in the event of breach of any of the above Non¬ discrimination covenants, the NCDOT will have the right to terminate the (license, permit, etc., as appropriate) and to enter or re-enter and repossess said land and the facilities thereon, and hold the same as if said (license, permit, etc., as appropriate) had never been made or issued. *
3. With respect to deeds, in the event of breach of any of the above Nondiscrimination covenants, the NCDOT will there upon revert to and vest in and become the absolute property of the NCDOT and its assigns. *

(*Reverter clause and related language to be used only when it is determined that such a clause is necessary to make clear the purpose of Title VI.)

STANDARD SPECIAL PROVISION

ON-THE-JOB TRAINING

(10-16-07) (Rev. 4-21-15) Z-10

Description

The North Carolina Department of Transportation will administer a custom version of the Federal On-the-Job Training (OJT) Program, commonly referred to as the Alternate OJT Program. All contractors (existing and newcomers) will be automatically placed in the Alternate Program. Standard OJT requirements typically associated with individual projects will no longer be applied at the project level. Instead, these requirements will be applicable on an annual basis for each contractor administered by the OJT Program Manager.

On the Job Training shall meet the requirements of 23 CFR 230.107 (b), 23 USC – Section 140, this provision and the On-the-Job Training Program Manual.

The Alternate OJT Program will allow a contractor to train employees on Federal, State and privately funded projects located in North Carolina. However, priority shall be given to training employees on NCDOT Federal-Aid funded projects.

Minorities and Women

Developing, training and upgrading of minorities and women toward journeyman level status is a primary objective of this special training provision. Accordingly, the Contractor shall make every effort to enroll minority and women as trainees to the extent that such persons are available within a reasonable area of recruitment. This training commitment is not intended, and shall not be used, to discriminate against any applicant for training, whether a member of a minority group or not.

Assigning Training Goals

The Department, through the OJT Program Manager, will assign training goals for a calendar year based on the contractors' past three years' activity and the contractors' anticipated upcoming year's activity with the Department. At the beginning of each year, all contractors eligible will be contacted by the Department to determine the number of trainees that will be assigned for the upcoming calendar year. At that time the Contractor shall enter into an agreement with the Department to provide a self-imposed on-the-job training program for the calendar year. This agreement will include a specific number of annual training goals agreed to by both parties. The number of training assignments may range from 1 to 15 per contractor per calendar year. The Contractor shall sign an agreement to fulfill their annual goal for the year.\

Training Classifications

The Contractor shall provide on-the-job training aimed at developing full journeyman level workers in the construction craft/operator positions. Preference shall be given to providing training in the following skilled work classifications:

Equipment Operators	Office Engineers
Truck Drivers	Estimators
Carpenters	Iron / Reinforcing Steel Workers
Concrete Finishers	Mechanics
Pipe Layers	Welders

The Department has established common training classifications and their respective training requirements that may be used by the contractors. However, the classifications established are not all-inclusive. Where the training is oriented toward construction applications, training will be allowed in lower-level management positions such as office engineers and estimators. Contractors shall submit new classifications for specific job functions that their employees are performing. The Department will review and recommend for acceptance to FHWA the new classifications proposed by contractors, if applicable. New classifications shall meet the following requirements:

Proposed training classifications are reasonable and realistic based on the job skill classification needs, and

The number of training hours specified in the training classification is consistent with common practices and provides enough time for the trainee to obtain journeyman level status.

The Contractor may allow trainees to be trained by a subcontractor provided that the Contractor retains primary responsibility for meeting the training and this provision is made applicable to the subcontract. However, only the Contractor will receive credit towards the annual goal for the trainee.

Where feasible, 25 percent of apprentices or trainees in each occupation shall be in their first year of apprenticeship or training. The number of trainees shall be distributed among the work classifications on the basis of the contractor's needs and the availability of journeymen in the various classifications within a reasonable area of recruitment.

No employee shall be employed as a trainee in any classification in which they have successfully completed a training course leading to journeyman level status or in which they have been employed as a journeyman.

Records and Reports

The Contractor shall maintain enrollment, monthly and completion reports documenting company compliance under these contract documents. These documents and any other information as requested shall be submitted to the OJT Program Manager.

Upon completion and graduation of the program, the Contractor shall provide each trainee with a certification Certificate showing the type and length of training satisfactorily completed.

Trainee Interviews

All trainees enrolled in the program will receive an initial and Trainee/Post graduate interview conducted by the OJT program staff.

Trainee Wages

Contractors shall compensate trainees on a graduating pay scale based upon a percentage of the prevailing minimum journeyman wages (Davis-Bacon Act). Minimum pay shall be as follows:

60 percent	of the journeyman wage for the first half of the training period
75 percent	of the journeyman wage for the third quarter of the training period
90 percent	of the journeyman wage for the last quarter of the training period

In no instance shall a trainee be paid less than the local minimum wage. The Contractor shall adhere to the minimum hourly wage rate that will satisfy both the NC Department of Labor (NCDOL) and the Department.

Achieving or Failing to Meet Training Goals

The Contractor will be credited for each trainee employed by him on the contract work who is currently enrolled or becomes enrolled in an approved program and who receives training for at least 50 percent of the specific program requirement. Trainees will be allowed to be transferred between projects if required by the Contractor's scheduled workload to meet training goals.

If a contractor fails to attain their training assignments for the calendar year, they may be taken off the NCDOT's Bidders List.

Measurement and Payment

No compensation will be made for providing required training in accordance with these contract documents.

LISTING OF MBE/WBE SUBCONTRACTORS

Sheet _____ of _____

Firm Name and Address	Circle One	Item No.	Item Description	* Agreed upon Unit Price	** Dollar Volume of Item
Name Address	MBE WBE				
Name Address	MBE WBE				
Name Address	MBE WBE				
Name Address	MBE WBE				
Name Address	MBE WBE				
Name Address	MBE WBE				

***** The Dollar Volume shown in this column shall be the Actual Price Agreed Upon by the Prime Contractor and the MBE/WBE subcontractor, and these prices will be used to determine the percentage of the MBE/WBE participation in the contract.

** Dollar Volume of MBE/WBE Subcontractor Percentage of Total Contract Bid Price:

If firm is a Material Supplier Only, show Dollar Volume as 60% of Agreed Upon Amount from Letter of Intent.

If firm is a Manufacturer, show Dollar Volume as 100% of Agreed Upon Amount from Letter of Intent.

LISTING OF MBE/WBE SUBCONTRACTORS

Sheet _____ of _____

Firm Name and Address	Circle One	Item No.	Item Description	* Agreed upon Unit Price	** Dollar Volume of Item
Name Address	MBE WBE				
Name Address	MBE WBE				
Name Address	MBE WBE				
Name Address	MBE WBE				
Name Address	MBE WBE				

**** Dollar Volume of MBE Subcontractor $ _____**

MBE Percentage of Total Contract Bid Price _____%

**** Dollar Volume of WBE Subcontractor $ _____**

WBE Percentage of Total Contract Bid Price _____%

***The Dollar Volume shown in this column shall be the Actual Price Agreed Upon by the Prime Contractor and the MBE/WBE subcontractor, and these prices will be used to determine the percentage of the MBE/WBE participation in the contract.**

**** Dollar Volume of MBE/WBE Subcontractor Percentage of Total Contract Bid Price.**
If firm is a Material Supplier Only, show Dollar Volume as 60% of Agreed Upon Amount from Letter of Intent.
If firm is a Manufacturer, show Dollar Volume as 100% of Agreed Upon Amount from Letter of Intent.

County : Nash

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
			ROADWAY ITEMS			
0001	0000920000-E	SP	GENERIC MISCELLANEOUS ITEM (ROCK EXCAVATION (MECHANICAL R EMOVAL))	50 CY		
0002	0000920000-E	SP	GENERIC MISCELLANEOUS ITEM (UNDERCUT UNSTABLE PIPE FOUNDA TION)	50 CY		
0003	0227000000-E	SP	GENERIC GRADING ITEM (CLEARING AND GRUBBING)	1 ACR		
0004	2591000000-E	848	4" CONCRETE SIDEWALK	20 SY		
0005	3656000000-E	876	GEOTEXTILE FOR DRAINAGE	450 SY		
0006	5329000000-E	1510	DUCTILE IRON WATER PIPE FITTINGS	1,150 LB		
0007	5666000000-N	1515	FIRE HYDRANT	1 EA		
0008	5673000000-E	1515	FIRE HYDRANT LEG	10 LF		
0009	5689000000-E	1515	GENERIC UTILITY ITEM (3" VALVE AND BOX)	2 EA		
0010	5689000000-E	1515	GENERIC UTILITY ITEM (6" GATE VALVE AND BOX)	4 EA		
0011	5689000000-E	1515	GENERIC UTILITY ITEM (6" TAPPING SLEEVE AND VALVE)	1 EA		
0012	5872600000-E	1550	DIRECTIONAL DRILLING OF **" (6" HORIZONTAL @ STA 10+37 TO 14+77)	441 LF		
0013	5872600000-E	1550	DIRECTIONAL DRILLING OF **" (6" HORIZONTAL @ STA 30+48 TO 33+19)	271 LF		
0014	5872600000-E	1550	DIRECTIONAL DRILLING OF **" (6" HORIZONTAL @ STA 37+60 TO 39+29)	175 LF		
0015	5889000000-E	1510	GENERIC UTILITY ITEM (3" WATER MAIN)	50 LF		
0016	5889000000-E	1510	GENERIC UTILITY ITEM (6" WATER MAIN)	3,900 LF		

County : Nash

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
0017	6000000000-E	1605	TEMPORARY SILT FENCE	6,200 LF		
0018	6006000000-E	1610	STONE FOR EROSION CONTROL, CLASS A	380 TON		
0019	6009000000-E	1610	STONE FOR EROSION CONTROL, CLASS B	25 TON		
0020	6012000000-E	1610	SEDIMENT CONTROL STONE	25 TON		
0021	6015000000-E	1615	TEMPORARY MULCHING	2.6 ACR		
0022	6018000000-E	1620	SEED FOR TEMPORARY SEEDING	130 LB		
0023	6021000000-E	1620	FERTILIZER FOR TEMPORARY SEEDING	0.52 TON		
0024	6024000000-E	1622	TEMPORARY SLOPE DRAINS	140 LF		
0025	6036000000-E	1631	MATTING FOR EROSION CONTROL	100 SY		
0026	6042000000-E	1632	1/4" HARDWARE CLOTH	40 LF		
0027	6071010000-E	SP	WATTLE	176 LF		
0028	6084000000-E	1660	SEEDING & MULCHING	2.6 ACR		

EXECUTION OF BID

NON-COLLUSION, DEBARMENT AND GIFT BAN CERTIFICATION

CORPORATION

The prequalified bidder being duly sworn, solemnly swears (or affirms) that neither he, nor any official, agent or employee has entered into any agreement, participated in any collusion, or otherwise taken any action which is in restraint of free competitive bidding in connection with any bid or contract, that the prequalified bidder has not been convicted of violating *N.C.G.S. §133-24* within the last three years, and that the prequalified bidder intends to do the work with his own bona fide employees or subcontractors and will not bid for the benefit of another contractor.

By submitting this non-collusion, debarment and gift ban certification, the Contractor is attesting his status under penalty of perjury under the laws of the United States in accordance with the Debarment Certification attached, provided that the Debarment Certification also includes any required statements concerning exceptions that are applicable.

N.C.G.S. §133-32 and Executive Order 24 prohibit the offer to, or acceptance by, any State Employee of any gift from anyone with a contract with the State, or from any person seeking to do business with the State. By execution of any response in this procurement, you attest, for your entire organization and its employees or agents, that you are not aware that any such gift has been offered, accepted, or promised by any employees of your organization.

SIGNATURE OF PREQUALIFIED BIDDER

_____

Full name of Corporation

_____

Address as Prequalified

Attest _____ By _____

Secretary/Assistant Secretary
(Select appropriate title)

President/Vice President/Assistant Vice President
(Select appropriate title)

_____

Print or type Signer's name

Print or type Signer's name

CORPORATE SEAL

NON-COLLUSION AFFIDAVIT, DEBARMENT CERTIFICATION AND GIFT BAN CERTIFICATION

PARTNERSHIP

The prequalified bidder, being duly sworn, solemnly swears (or affirms) that neither he, nor any official, agent or employee has entered into any agreement, participated in any collusion, or otherwise taken any action which is in restraint of free competitive bidding in connection with any bid or contract, that the prequalified bidder has not been convicted of violating *N.C.G.S. § 133-24* within the last three years, and that the prequalified bidder intends to do the work with its own bona fide employees or subcontractors and will not bid for the benefit of another contractor.

By submitting this non-collusion, debarment and gift ban certification, the Contractor is attesting his status under penalty of perjury under the laws of the United States in accordance with the Debarment Certification attached, provided that the Debarment Certification also includes any required statements concerning exceptions that are applicable.

N.C.G.S. § 133-32 and Executive Order 24 prohibit the offer to, or acceptance by, any State Employee of any gift from anyone with a contract with the State, or from any person seeking to do business with the State. By execution of any response in this procurement, you attest, for your entire organization and its employees or agents, that you are not aware that any such gift has been offered, accepted, or promised by any employees of your organization.

SIGNATURE OF PREQUALIFIED BIDDER

_____

Full Name of
Partnership

_____

Address as
Prequalified

_____ _____

Signature of Witness Signature of Partner

_____ _____

Print or Type Signer's Name Print or Type Signer's Name

NON-COLLUSION AFFIDAVIT, DEBARMENT CERTIFICATION AND GIFT BAN CERTIFICATION

LIMITED LIABILITY COMPANY

The prequalified bidder, being duly sworn, solemnly swears (or affirms) that neither he, nor any official, agent or employee has entered into any agreement, participated in any collusion, or otherwise taken any action which is in restraint of free competitive bidding in connection with any bid or contract, that the prequalified bidder has not been convicted of violating *N.C.G.S. § 133-24* within the last three years, and that the prequalified bidder intends to do the work with its own bona fide employees or subcontractors and will not bid for the benefit of another contractor.

By submitting this non-collusion, debarment and gift ban certification, the Contractor is attesting his status under penalty of perjury under the laws of the United States in accordance with the Debarment Certification attached, provided that the Debarment Certification also includes any required statements concerning exceptions that are applicable.

N.C.G.S. § 133-32 and Executive Order 24 prohibit the offer to, or acceptance by, any State Employee of any gift from anyone with a contract with the State, or from any person seeking to do business with the State. By execution of any response in this procurement, you attest, for your entire organization and its employees or agents, that you are not aware that any such gift has been offered, accepted, or promised by any employees of your organization.

SIGNATURE OF PREQUALIFIED BIDDER

_____

Full Name of Firm

_____

Address as Prequalified

_____	_____
Signature of Witness	Signature of Member/Manager/Authorized Agent *(Select appropriate Title)*
_____	_____
Print or Type Signer's Name	Print or Type Signer's Name

NON-COLLUSION, DEBARMENT AND GIFT BAN CERTIFICATION

JOINT VENTURE (2) or (3)

The prequalified bidder, being duly sworn, solemnly swears (or affirms) that neither he, nor any official, agent or employee has entered into any agreement, participated in any collusion, or otherwise taken any action which is in restraint of free competitive bidding in connection with any bid or contract, that the prequalified bidder has not been convicted of violating *N.C.G.S. § 133-24* within the last three years, and that the prequalified bidder intends to do the work with its own bona fide employees or subcontractors and will not bid for the benefit of another contractor.

By submitting this non-collusion, debarment and gift ban certification, the Contractor is attesting his status under penalty of perjury under the laws of the United States in accordance with the Debarment Certification attached, provided that the Debarment Certification also includes any required statements concerning exceptions that are applicable.

N.C.G.S. § 133-32 and Executive Order 24 prohibit the offer to, or acceptance by, any State Employee of any gift from anyone with a contract with the State, or from any person seeking to do business with the State. By execution of any response in this procurement, you attest, for your entire organization and its employees or agents, that you are not aware that any such gift has been offered, accepted, or promised by any employees of your organization.

SIGNATURE OF PREQUALIFIED BIDDER

Instructions: **2 Joint Venturers** Fill in lines (1), (2) and (3) and execute. **3 Joint Venturers** Fill in lines (1), (2), (3) and (4) and execute. On Line (1), fill in the name of the Joint Venture Company. On Line (2), fill in the name of one of the joint venturers and execute below in the appropriate manner. On Line (3), print or type the name of the other joint venturer and execute below in the appropriate manner. On Line (4), fill in the name of the third joint venturer, if applicable and execute below in the appropriate manner.

(1) _____
Name of Joint Venture

(2) _____
Name of Contractor

_____
Address as Prequalified

_____ BY _____
Signature of Witness or Attest — Signature of Contractor

_____ _____
Print or Type Signer's Name — Print or Type Signer's Name

If Corporation, affix Corporate Seal AND

(3) _____
Name of Contractor

_____
Address as Prequalified

_____ BY _____
Signature of Witness or Attest — Signature of Contractor

_____ _____
Print or Type Signer's Name — Print or Type Signer's Name

If Corporation, affix Corporate Seal AND

(4) _____
Name of Contractor

_____
Address as Prequalified

_____ BY _____
Signature of Witness or Attest — Signature of Contractor

_____ _____
Print or Type Signer's Name — Print or Type Signer's Name

If Corporation, affix Corporate Seal

NON-COLLUSION AFFIDAVIT, DEBARMENT CERTIFICATION AND GIFT BAN CERTIFICATION

INDIVIDUAL DOING BUSINESS UNDER A FIRM NAME

The prequalified bidder, being duly sworn, solemnly swears (or affirms) that neither he, nor any official, agent or employee has entered into any agreement, participated in any collusion, or otherwise taken any action which is in restraint of free competitive bidding in connection with any bid or contract, that the prequalified bidder has not been convicted of violating *N.C.G.S. § 133-24* within the last three years, and that the prequalified bidder intends to do the work with its own bona fide employees or subcontractors and will not bid for the benefit of another contractor.

By submitting this non-collusion, debarment and gift ban certification, the Contractor is attesting his status under penalty of perjury under the laws of the United States in accordance with the Debarment Certification attached, provided that the Debarment Certification also includes any required statements concerning exceptions that are applicable.

N.C.G.S. § 133-32 and Executive Order 24 prohibit the offer to, or acceptance by, any State Employee of any gift from anyone with a contract with the State, or from any person seeking to do business with the State. By execution of any response in this procurement, you attest, for your entire organization and its employees or agents, that you are not aware that any such gift has been offered, accepted, or promised by any employees of your organization.

SIGNATURE OF PREQUALIFIED BIDDER

Name of Prequalified Bidder _____
Individual Name

Trading and Doing Business As _____
Full name of Firm

_____
Address as Prequalified

_____ _____
Signature of Witness Signature of Prequalified Bidder, Individual

_____ _____
Print or Type Signer's Name Print or Type Signer's Name

NON-COLLUSION AFFIDAVIT, DEBARMENT CERTIFICATION AND GIFT BAN CERTIFICATION

INDIVIDUAL DOING BUSINESS IN HIS OWN NAME

The prequalified bidder, being duly sworn, solemnly swears (or affirms) that neither he, nor any official, agent or employee has entered into any agreement, participated in any collusion, or otherwise taken any action which is in restraint of free competitive bidding in connection with any bid or contract, that the prequalified bidder has not been convicted of violating *N.C.G.S. § 133-24* within the last three years, and that the prequalified bidder intends to do the work with its own bona fide employees or subcontractors and will not bid for the benefit of another contractor.

By submitting this non-collusion, debarment and gift ban certification, the Contractor is attesting his status under penalty of perjury under the laws of the United States in accordance with the Debarment Certification attached, provided that the Debarment Certification also includes any required statements concerning exceptions that are applicable.

N.C.G.S. § 133-32 and Executive Order 24 prohibit the offer to, or acceptance by, any State Employee of any gift from anyone with a contract with the State, or from any person seeking to do business with the State. By execution of any response in this procurement, you attest, for your entire organization and its employees or agents, that you are not aware that any such gift has been offered, accepted, or promised by any employees of your organization.

SIGNATURE OF PREQUALIFIED BIDDER

Name of Prequalified Bidder _____

Print or Type Name

_____

Address as Prequalified

_____

Signature of Prequalified Bidder, Individually

_____

Print or type Signer's Name

_____

Signature of Witness

_____

Print or type Signer's name

DEBARMENT CERTIFICATION OF PREQUALIFIED BIDDER

Conditions for certification:

1. The prequalified bidder shall provide immediate written notice to the Department if at any time the bidder learns that his certification was erroneous when he submitted his debarment certification or explanation that is file with the Department, or has become erroneous because of changed circumstances.

2. The terms *covered transaction*, *debarred*, *suspended*, *ineligible*, *lower tier covered transaction*, *participant*, *person*, *primary covered transaction*, *principal*, *proposal*, and *voluntarily excluded*, as used in this provision, have the meanings set out in the Definitions and Coverage sections of the rules implementing Executive Order 12549. A copy of the Federal Rules requiring this certification and detailing the definitions and coverages may be obtained from the Contract Officer of the Department.

3. The prequalified bidder agrees by submitting this form, that he will not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in NCDOT contracts, unless authorized by the Department.

4. For Federal Aid projects, the prequalified bidder further agrees that by submitting this form he will include the Federal-Aid Provision titled *Required Contract Provisions Federal-Aid Construction Contract (Form FHWA PR 1273*) provided by the Department, without subsequent modification, in all lower tier covered transactions.

5. The prequalified bidder may rely upon a certification of a participant in a lower tier covered transaction that he is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless he knows that the certification is erroneous. The bidder may decide the method and frequency by which he will determine the eligibility of his subcontractors.

6. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the certification required by this provision. The knowledge and information of a participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

7. Except as authorized in paragraph 6 herein, the Department may terminate any contract if the bidder knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available by the Federal Government.

DEBARMENT CERTIFICATION

The prequalified bidder certifies to the best of his knowledge and belief, that he and his principals:

a. Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency;

b. Have not within a three-year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records; making false statements; or receiving stolen property;

c. Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated in paragraph b. of this certification; and

d. Have not within a three-year period preceding this proposal had one or more public transactions (Federal, State or local) terminated for cause or default.

e. Will submit a revised Debarment Certification immediately if his status changes and will show in his bid proposal an explanation for the change in status.

If the prequalified bidder cannot certify that he is not debarred, he shall provide an explanation with this submittal. An explanation will not necessarily result in denial of participation in a contract.

Failure to submit a non-collusion affidavit and debarment certification will result in the prequalified bidder's bid being considered non-responsive.

☐ Check here if an explanation is attached to this certification.

Execution of Contract

Contract No: DD00288

County: NASH COUNTY

ACCEPTED BY THE DEPARTMENT

_____

Proposals Engineer

_____

Date

EXECUTION OF CONTRACT AND BONDS
APPROVED AS TO FORM:

_____

for **Division Engineer**

_____

Date