COUNTY OF SPOTSYLVANIA, VIRGINIA
INVITATION FOR BID (IFB) #20-03-EG
MASSAPONAX INTERCEPTOR REPLACEMENT PHASE IV
February 20, 2020

Name of Soliciting Public Body:
County of Spotsylvania, Procurement Division
P.O. Box 215
8800 Courthouse Road, 2nd Floor Room 414
Spotsylvania, VA  22553

NON-MANDATORY PRE-BID MEETING DATE AND TIME:
A non-mandatory pre-bid meeting will be held March 12, 2020 @ 10:00 AM, at the Spotsylvania County Utilities Department located at 600 Hudgins Road, Fredericksburg, VA  22408.

QUESTIONS DUE DATE AND TIME:
Questions from Bidders must be received by 12 noon, on March 19, 2020. The County is not responsible for verbal clarification of information provided by parties other than staff of the Procurement Division.

BIDS DUE DATE AND TIME:
Sealed Bids Will Be Received until March 31, 2020 at 2:00 PM for Furnishing the Services Described Herein.

Bids Shall Be Mailed Or Hand Delivered To:
Spotsylvania County Procurement Division
P.O. Box 215
8800 Courthouse Road, 2nd Floor Room 414
Spotsylvania, VA 22553

All Inquiries For Information Should Be Directed To:
Elaine Guinn, Procurement Officer I
Phone: (540)507-7599
Email:  eguinn@spotsylvania.va.us

All updates are posted on the Spotsylvania County web site at http://www.spotsylvania.va.us/374/Solicitations
It is the responsibility of the vendor to check back for updates.
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I. PURPOSE

The County of Spotsylvania, VA is seeking bids from qualified Contractors to provide construction services and materials for the Massaponax Interceptor Replacement Phase IV. The successful Contractor shall perform all construction activities and provide all construction management, necessary tools, equipment, materials, fuel, insurance, personnel, and supervision to complete the Project as described herein. The successful Contractor shall fulfill the obligations of any Contract resulting from this IFB at the direction of the County and follow accordingly all federal, state and local regulations.

II. BASIS OF AWARD

The award of a contract resulting from this Invitation for Bid shall be based on the following criteria submitted from the lowest responsive and responsible bidder:

**Price** - The bids will be evaluated and contract award will be made to the lowest responsive and responsible bidder according to Spotsylvania County Procurement Policy. Contract award will be based on the Total Bid Price, as stated on Attachment D, Bid Form. In case of arithmetic errors, the unit price will govern.

The County reserves the right to reject any and all bids in whole or in part and to waive any informality prior to making an award.

III. INSTRUCTIONS TO BIDDERS

A. This competitive sealed bidding procurement shall be conducted in accordance with the Spotsylvania County Procurement Policy. The Procurement Policy is available at [http://www.spotsylvania.va.us/377/Spotsylvania-County-Policies](http://www.spotsylvania.va.us/377/Spotsylvania-County-Policies)

B. Bids may be withdrawn at any time before the bid opening. A Bidder wishing to withdraw the bid after bid opening may do so in accordance with Spotsylvania Procurement Policy Section 2-24.

C. Bids must be made by utilizing, initialing and signing Attachment D, Bid Form. The Bid Form (all pages) of this IFB must be completed and returned for a bidder to be considered responsive. Specifications incorporated into this Invitation to Bid shall be followed accordingly.

The Response Statement of the Bid Form must be completed in a sufficient manner to allow for a detailed comparison of the IFB Specifications and the bidder’s proposed construction work to ascertain adherence to the Specifications. The bidder must explain in the Response Statement any deviations from the Specifications.

D. All inquiries for information regarding bid submission requirements or procurement procedures shall be directed to:
Questions must be e-mailed to Spotsylvania County. All responses to inquiries will be in writing in the form of an Addendum and will be posted on the Procurement Division website - [http://www.spotsylvania.va.us/374/Solicitations](http://www.spotsylvania.va.us/374/Solicitations). Questions from Bidders must be received by the time stated on Page 1 of this Invitation For Bid. The County is not responsible for verbal clarification of information provided by parties other than staff of the Procurement Division.

E. Bidders are responsible for familiarizing themselves with all of the requirements stated herein.

F. All bids must be in a sealed envelope and clearly marked in the lower left hand corner:

   Business/Contractor Name  
   Sealed Bid, Spotsylvania County IFB #20-03-EG, Massaponax Interceptor Replacement Phase IV  
   Bid Opening: (Insert Date and Time as stated on Page 1 of this IFB)  
   DO NOT OPEN

G. Bids will be accepted until the time stated on Page 1 of this IFB. Bids will be opened at the Spotsylvania County Procurement Division, 8800 Courthouse Road (the Marshall Center), 2nd Floor Room 414, Spotsylvania, VA 22553.

The Bidder has the sole responsibility to have their bid received by the Spotsylvania County Procurement Division at the above address and by the above stated time and date. **Please note that Federal Express and other overnight delivery services do not guarantee morning delivery to Spotsylvania, Virginia. Next day delivery usually arrives in mid-to-late afternoon. Also, please note that USPS deliveries require additional days from the post office to the Procurement Office.** If you will be using one of these services for delivery of your bid, please take this information into consideration.

H. Late Bids shall not be considered and will be returned to bidder unopened if received by special carrier or not accepted if hand delivered by bidder. The time of receipt shall be determined by the time clock stamp in the Procurement Division, Room 414.

Inclement weather: In the event that Spotsylvania County is closed during the scheduled times for a pre-bid (pre-proposal) conference or bid opening; the pre-bid conference or bid opening will occur in the next business day that Spotsylvania County is open at the appropriate times as stated in the IFB. No exceptions will be made in this situation. Please contact the procurement officer as stated in the IFB for information pertaining to this procurement.

I. Specifications incorporated into this Invitation to Bid should be followed accordingly. Bids must be made by utilizing and signing the Bid Forms. The bid form must include the total bid price, warranty
details and exceptions to the specification (if any), to be considered responsive. The Bid Form in its entirety must be completed and returned for a bidder to be considered responsive.

J. All warranties shall commence from the date of Spotsylvania County’s acceptance of the completed work. The contractor warrants that, unless otherwise specified, all materials and equipment incorporated in the work under the contract shall be new, first class condition, and in accordance with the contract documents. The contractor further warrants that all workmanship shall be of the highest quality and in accordance with contract documents and shall be performed by persons qualified at their respective trades. Work not conforming to these warranties shall be considered defective. This warranty of materials and workmanship separate and independent from and in addition to any of the contractor’s other guarantees or obligations in this contract.

The minimum warranty/maintenance period for the construction and related accessories shall be at least two years unless otherwise specified in the Specifications incorporated herein and made part of this IFB and shall start from the date of Spotsylvania County’s acceptance of the completed work.

K. **BID BOND:** All bids shall be accompanied by a Bid Bond from a surety company selected by the Bidder, which is legally authorized to do business in Virginia in the amount of five percent (5%) of the amount of the bid if the bid price is in an amount of or over $100,000. If the bid price is less than $100,000 the County may ask for a bid bond after the opening of the IFB and performance and payment bonds before work commences. In lieu of a Bid Bond, a Bidder may furnish a certified check or cash escrow in the face amount required for the bond. Such bid guarantee shall be submitted with the understanding of the following: It shall guarantee that the Bidder will not withdraw his bid during the period of 150 days following the opening of bids; if his bid is accepted, he will enter into a formal Contract with Spotsylvania County in accordance with the County Agreement or Purchase Order included as a part of the Contract Documents; and the Standard Performance Bond and the Standard Labor and Material Payment Bond shall be given. And further, in the event of the withdrawal of the said bid within said period, or failure to enter into said Contract and give said Bonds within ten (10) days after he has received Notice of Award, the Bidder shall be liable to the Spotsylvania County Board of Supervisors for the lesser of (i) the difference between the Bid for which the Bond was written and the next low Bid, or (ii) the face amount of the Bid Bond. This amount represents the damage to the Spotsylvania County Board of Supervisors on account of the default of the Bidder in any particular hereof.

L. As a guideline, Spotsylvania County anticipates the following timetable for selection of a Contractor.

<table>
<thead>
<tr>
<th>Date</th>
<th>Activity/Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>February 20, 2020</td>
<td>Invitation for Bid Issued</td>
</tr>
<tr>
<td>May - June 2020</td>
<td>Anticipated Award</td>
</tr>
</tbody>
</table>

M. Bid price will include freight to the specified delivery location in Spotsylvania County, Virginia, and associated insurance. It shall be the responsibility of the contractor to make all arrangements for
delivery, unloading, receiving and storing materials. The County will not assume any responsibility for receiving these shipments. Contractor shall check with owner and make necessary arrangements for security and storage.

N. Failure to manually sign the bid may disqualify it. The person signing bid shall show title or authority to bind his firm in a Contract.

O. Any quantities indicated in this IFB are for informational purposes only and are not guaranteed to be purchased.

P. The prices quoted on the Bid Form shall be firm for 150 days. Prices shall be submitted in the unit of measurement specified on the Bid Form. No separate line item charges shall be permitted for either bidding or invoicing purposes on the items appearing on the Bid Form, which would include but are not limited to equipment rental, detention, demurrage, drop ship charges, local freight, or any other extraneous charges. Insertion of delivery costs, disclaimers, or limitations of liability, and the like which are not expressly allowed in this IFB will be cause for rejection of the bid.

Q. Payment for the work included in this section will be in accordance with the unit prices set forth in the bid for the quantity of worked performed.

R. To perform public work in the Commonwealth of Virginia, the successful Bidder (Contractor) and any Subcontractor working for the Contractor shall hold a Contractor’s and Business License as required by state law and local ordinances. Bidders are required to be licensed Contractors in the Commonwealth of Virginia in compliance with Title 54.1 of the Virginia Code. The bidder shall show evidence of compliance with these licensing requirements as a condition of the Bid being considered. The Bidder’s Virginia Contractor’s License Number shall be listed on the Bid Form of this Invitation for Bid.

The successful Bidder (Contractor) shall have been engaged in construction of sanitary sewer line and water line work for a length of time sufficient to establish his competence for providing the required management, work, and expertise. A list of 3 References for which the Contractor has provided similar work over the last 5 years similar in Scope to that which is described herein shall be provided with the Bid Package. Spotsylvania County cannot be listed as a reference.

S. Any vendor transacting business with Spotsylvania County may be asked to provide proof of registration with the State Corporation Commission (SCC), as required by Sections 13.1 or Title 50 of the Code of Virginia.

IV. SCOPE OF WORK

Bids will be received for qualified contractors to provide construction services and materials for construction of a sanitary sewer line and water line from Gordon Road to Enchanted Woods Way in Spotsylvania County, VA. This project includes installation approximately 5,780 feet of sanitary sewer line, 2,000 feet of water line, the abandonment of the pump station and all ancillary work necessary for the complete and proper

The Drawings are available for $75.00 per set (plus shipping), as non-refundable, from Whitman, Requardt & Associates (WR&A), Attention: Charles Luck, P.E., 9030 Stoney Point Parkway, Suite 220, Richmond, VA 23235 Phone 804-272-8700. Plans purchased from WR&A may also be picked up at Spotsylvania County Utilities Department, Attention Ronald L. Baker, Jr., 600 Hudgins Road, Fredericksburg, VA 22408 Phone 540-507-7300, Monday through Friday from 8:00 a.m. to 4:30 p.m.

V. CONTRACT PERFORMANCE

A. Performance, Payment Bonds

Upon the award of a public construction Contract resulting from this IFB which exceeds $100,000 awarded to the successful Bidder(s) (Contractor(s), the Contractor shall furnish to Spotsylvania County Performance and Payment bonds. If a contract is under $100,000 the County may request the bonds in accordance with the Spotsylvania County Procurement Policy. The following bonds shall be furnished to Spotsylvania County:

1. A Performance Bond in the penal sum of 100 percent of the dollar value of the contract conditioned upon the faithful performance of the Contract in strict conformity with the Plans, Specifications, and Terms and Conditions of the Contract. Said bond for the faithful performance of the Contract shall remain in existence for the duration of the Contract performance time period until final acceptance of the project by Spotsylvania County.

2. Payment Bond in the sum of the Contract amount. Such bond shall be for the protection of Claimants who have and fulfill contracts to supply labor or materials to the Contractor to whom the Contract resulting from this IFB was awarded or to any Subcontractors, in the prosecution of the Work provided for in such Contract, and shall be conditioned upon the prompt payment for all such material furnished or labor supplied or performed in the prosecution of the Work. Labor or materials shall include public utility services and reasonable rentals of equipment, but only for periods when the equipment rented is actually used at the Work Site.

3. Each of the above bonds shall be executed by one or more surety companies, selected by the Contractor, which are legally authorized to do business in Virginia. Bonds shall be payable to Spotsylvania County. The Contractor shall present the Performance Bond and Payment Bond to the Spotsylvania County Procurement Division within 15 days after receipt of a fully executed Contract and prior to any Site Work. The Performance Bond shall remain in existence for the duration of the Contract performance time period, and the Payment Bond shall remain in existence for one year after final acceptance of the Work by Spotsylvania County.
In lieu of payment or Performance Bonds, the Contractors may furnish a certified check or cash escrow in the face amount required for each of the bonds and which will be held for the statutory period as applicable for each bond.

B. Delivery and Installation Address

The Massaponax Interceptor Replacement Phase IV project shall be performed as described in the Scope of Work indicated in Section IV.

C. Notice to Proceed

A written “Notice to Proceed” shall be issued by Spotsylvania County to the Contractor fixing the date on which the Contract time will commence to run and on which the Contractor shall be authorized to begin the Work.

D. Pre-Construction Meeting

Before construction services have started, a representative of the Contractor shall confer with representatives of the Spotsylvania County Utilities Department and shall provide such planning, measurements, schedules etc., as are required to ensure that the planned construction activities meet the requirements of the County. At this meeting, Limits of Authority, changes, and General Procedures shall be explained.

E. Period of Contract Performance and Completion Date

The Massaponax Interceptor Replacement Phase IV shall be completed by the Contractor within 365 calendar days as measured from the date of the Notice to Proceed. The date which is 300 calendar days past the Notice to Proceed shall be the Contract Substantial Completion date.

The Contractor, in submitting his bid, acknowledges that he has taken into consideration normal weather conditions. Normal weather does not mean statistically average weather, but rather means a range of weather patterns which might be anticipated based on weather data for the past ten (10) years, (i.e., conditions which are not extremely unusual). Normal weather conditions shall be determined from the public historical records available, including the U. S. Department of Commerce, Local Climatological Data Sheets, National Oceanic and Atmospheric Administration/Environmental Data and Information services, National Climatic Center and National Weather Service. The data sheets to be used shall be those for the locality closest to the site of the work.

F. Liquidated Damages

Should the contractor fail to complete the work and/or installation or any part thereof, in the time specified in the Contract Documents, the contractor shall reimburse Spotsylvania County for the additional expense and damage for each calendar day that substantial and final completion has not been achieved. The amount of such additional expense and damage incurred by reason of failure to
achieve substantial completion is the per diem rate of $500. The amount of such additional expense and damage incurred by reason of failure to achieve final completion is the per diem rate of $750. Such liquidated damages are in addition to any other ascertainable damage allowable by law, which Spotsylvania County sustains for the contractor’s breach of the contract. Spotsylvania County shall have the right to deduct liquidated damages or other such damages from any amount due, or that may become due the contractor, or the amount of such damages shall be due and collectable from the contractor or his surety. It is understood and agreed by the Contractor that any liquidated damages payable in accordance with this Agreement are not a penalty and that such sums are reasonable under the circumstances existing as of the date of execution and delivery of this Agreement. The Contractor further acknowledges and agrees that liquidated damages may be owed even though no default has occurred or been declared.

G. Work Site Damages:

Any damage to existing utilities, equipment or finished surfaces resulting from the performance of this contract shall be repaired to Spotsylvania County’s satisfaction at the contractor’s expense.

H. Permits

The Contractor shall be responsible for obtaining all permits as indicated in the Specifications detailed in the IFB, and Construction Drawings of this IFB.

The Contractor must provide all contractors licensing information as detailed in Section V, Paragraph I below.

I. Contractor and Sub-Contractor Licenses

Spotsylvania County requires a general contractor to provide copies of all its construction and business licenses to the County Code Compliance Department.

Upon award of a contract, and prior to work, the successful bidder (contractor) shall be responsible for providing the County’s Code Compliance Department with the names of all contractors and subcontractors involved with the project and copies of their Virginia Contractor’s Licenses, Virginia Tradesman Certificates and Spotsylvania County Business Licenses, where applicable.

In addition, the contractor shall complete a sub-contractor roster. This must be returned to the County Business License Office prior to final inspection of the completed work.

J. Inspection

a. All material and workmanship shall be subject to inspection, examination, and test by the owner and its project inspector at any and all times during construction. The project inspector shall have authority to reject defective material and workmanship and require its correction. Rejected workmanship shall be satisfactorily corrected and rejected material shall be satisfactorily replaced
with proper material without charge therefore, and the contractor shall promptly segregate and remove the rejected material from the premises. If the contractor fails to proceed at once with replacement of rejected material and/or the correction of defective workmanship, the owner may, by contract or otherwise, replace such material and/or correct such workmanship and charge the cost to the contractor, or may terminate the right of the contractor to proceed, the contractor and surety being liable for any damages.

b. Job-site inspections, tests conducted on site or tests of materials gathered on site, which the contract requires to be performed by independent testing entities, shall be contracted and paid for by the owner. Examples of such tests are the testing of cast in-place concrete, foundation materials, soil compaction, pile installations, caisson bearings, and steel framing connections. Although conducted by independent testing entities, the County will not contract and pay for tests or certifications of materials, manufactured products, or assemblies which the contract, codes, standards, etc. require to be tested and/or certified for compliance with industry standards such as Underwriters Laboratories, Factory Mutual, or ASTM. If there are any fees to be paid for such tests and certifications, they will be paid by the contractor. The contractor shall also pay for all inspections, tests, and certifications which the contract specifically requires him to perform or pay, together with any inspections and tests which he chooses to perform for his own quality control purposes. The contractor shall promptly furnish, without additional charge, all reasonable facilities, labor, and materials necessary and convenient for making such tests. Except as provided in (c) below, whenever such examination and testing finds defective materials, equipment, or workmanship, the contractor shall reimburse the owner for the cost of re-examination and retesting.

c. Should it be considered necessary or advisable by the County at any time before final acceptance of the entire work to make an examination of any part of the work already completed, by removing or tearing out portions of the work, the contractor shall on request promptly furnish all necessary facilities, labor and material to expose the work to be tested to the extent required. If such work is found to be defective in any respect, due to the fault of the contractor or his subcontractors, he shall defray all the expenses of uncovering the work, of examination and testing, and of satisfactory reconstruction. If, however, such work is found to meet the requirements of the contract, the actual cost of the contractor’s labor and material necessarily involved in uncovering the work, the cost of examination and testing, and contractor’s cost of material and labor necessary for replacement shall be paid to the contractor and he shall, in addition, if completion of the work has been delayed thereby, be granted a suitable extension of time.

d. The contractor project inspector will recommend to the County that the work be suspended when in his judgment the drawings and specifications are not being followed. Any such suspension shall be continued only until the matter in question is resolved to the satisfaction of the owner. The cost of any such work stoppage shall be borne by the contractor unless it is later determined that no fault existed in the contractor’s work.

e. The Contractor’s Project Inspector has no authority to and shall not:

   (1) Authorize deviations from the contract documents;
(2) Enter into the area of responsibility of the contractor’s superintendent;

(3) Issue directions relative to any aspect of construction means, methods, techniques, sequences or procedures, or in regard to safety precautions and programs in connection with the work;

(4) Authorize or suggest that the owner occupy the project, in whole or in part;

(5) Issue a certificate for payment.

K. Contractor’s Title to Materials

No materials or supplies for the work shall be purchased by the contractor or by any subcontractor subject to any security interest, installment or sales contract or any other agreement or lien by which an interest is retained by the seller or is given to a secured party. The contractor warrants that he has clear title to all materials and supplies which he uses in the work or for which he accepts payment in whole or in part.

L. Pipeline Locations and Miss Utility

The contractor shall be responsible for calling Miss Utility of Virginia at (800) 552-7001 prior to digging at the work site.

M. Modification of a Contract

Change orders shall be reviewed by the project manager, Engineer, if required, and state agency, if required, for accuracy. Change orders will require signature of all parties and a detailed summary of the change in scope of work. Once review is complete change order will be submitted to the Procurement Division for review and a modification to the contract amount, if needed, will be prepared and approved by the Procurement Manager.

N. Retainage

Retainage will be held in the amount of 5% of the contract price until final completion of project and is accepted by the County. Any payment made by the County to the Contractor shall be less a Five Percent (5%) retainage to assure faithful performance of the Work required under the Contract. All amounts retained under this provision shall be included in the Final Payment upon Final Completion.
VI. TERMS AND CONDITIONS: (Effective March 4, 2019)

A. Acceptance, Invoicing and Payment

Spotsylvania County will make payment to the Contractor, Net 30 days or in accordance with discount terms, if offered, after receipt of an acceptable invoice for services or goods rendered resulting from this IFB.

Pursuant to Virginia Code § 2.2-4354, (1950, as amended), the CONTRACTOR covenants and agrees to:

1. Within seven (7) days after receipt of any amounts paid to the CONTRACTOR under the Agreement, (i) pay any subcontractor for its proportionate share of the total payment received from the COUNTY attributable to the work under the Contract performed by such subcontractor, or (ii) notify the COUNTY and the subcontractor, in writing, of its intention to withheld all or part of the subcontractor’s payment and the reason therefore;
2. Provide its federal employer identification number or social security number, as applicable, before any payment is made to the CONTRACTOR under the Agreement;
3. Pay interest at the legal rate or such other rate as may be agreed to in writing by the subcontractor and the CONTRACTOR on all amounts owed by the CONTRACTOR that remain unpaid after seven (7) days following receipt by the CONTRACTOR of payment from the COUNTY for work performed by the subcontractor under the Agreement; and
4. Include in its contracts with any and all subcontractors the requirements of 1, 2, and 3 above.

B. Attorney’s Fees

In the event of any action brought by either party against the other to enforce any of the obligations hereunder or arising out of any dispute concerning the terms and conditions hereby created, each party shall pay their own attorney’s fees, costs and expenses, except in a case of default by the Contractor, the Contractor shall be responsible for any resulting additional purchase and administrative costs including, but not limited to fees and charges of engineers, architects, attorneys, and other professionals and all court or other dispute resolution costs.

C. Audit

Contractor shall keep and require each of its Subcontractor, if any, to keep, at no additional cost to County, full and detailed accounts of costs chargeable to County, during the project, and for five (5) years following completion. County shall be afforded full access to accounts, records, and supporting documents for review, audit, copy (such copies will be the property of County), and verification of costs. Audit access to Contractor’s records in lump sum or unit price areas when applicable shall be sufficient to satisfy County that all quantities meet the payments to its subcontractor and suppliers, Contractor shall remit promptly to County the amount of any adjustment resulting from audit.

D. Availability of Funds
It is understood and agreed between the parties herein that the County shall be bound hereunder only to the extent of the funds available or which may hereafter become available for the purpose of this agreement.

E. Binding Effect

The terms, provisions, covenants and conditions contained in any resulting contract shall apply to, insure to the benefit of, and be binding upon the parties hereto and upon their respective heirs, legal representatives, successors, and permitted assigns except as otherwise expressly provided.

F. Compliance of Law

The Contractor providing materials and services to the County under any contract resulting from this IFB represents and warrants to the County that it is:

3. Complying with federal, state and local laws and regulation applicable to the performance of the services procured; and
4. In full compliance with the Virginia Conflict of Interest Act.

G. Contract Award

Spotsylvania County reserves the right to accept or reject any and/or all bids, and to waive informalities. Spotsylvania County reserves the right to award any contract resulting from this IFB to the lowest priced responsive and responsible bidder, resulting in a contract that is most advantageous and in the best interest of Spotsylvania County. Spotsylvania County shall be the sole judge of the bids and the resulting contract that best serves the public interest, and Spotsylvania County’s decision shall be final.

Negotiation with the Lowest Bidder: Unless all bids are cancelled or rejected, the County reserves the right granted by Virginia Code § 2.2-4318 to negotiate with the lowest responsive, responsible bidder to obtain a contract price within the funds available to the agency whenever such low bid exceeds the agency’s available funds. For the purpose of determining when such negotiations may take place, the term “available funds” shall mean those funds which were budgeted by the agency for this contract prior to the issuance of the written Invitation for Bids. Negotiations with the low bidder may include both modifications of the bid price and the Scope of Work/Specifications to be performed. The agency shall initiate such negotiations by notice to the lowest responsive, responsible bidder that its bid exceeds the available funds and that the agency wishes to negotiate a lower contract price. The times, places, and manner of negotiating shall be agreed to by the agency and the lowest responsive, responsible bidder.

H. Contract Changes

No verbal agreement or conversation with any officer, agent or employee of Spotsylvania County either before or after execution of the contract resulting from this Invitation for Bid (IFB), IFB Addendum or
follow-on negotiations, shall effect or modify any of the terms or obligations contained in the contract. No alterations to the terms and conditions of the contract shall be valid or binding upon Spotsylvania County unless made in writing and where Board approval is not required, by the county Administrator or his designee.

Contract Extension: This contract may be extended during the term of the existing contract for services allowed to complete any work undertaken but not completed during the original term of the contract.

I. Contract Documents

The contract entered into by Spotsylvania County and the Contractor shall consist of this Invitation For Bid, the Specification, any Addendum issued, the signed Bid Forms submitted by the Contractor, Spotsylvania County’s Standard Form Agreement, Purchase Order and any approved change orders issued, all of which shall be referred to collectively as the Contract Documents. Additional documents which the parties agree to include as contract documents may be set forth in the final contract.

J. Definitions:

1. Contractor:
The successful bidder who enters into a contract with Spotsylvania County to provide the goods or services as specified herein.

2. County/Owner:
Wherever the word "County or Owner" appears, it shall be understood to mean the Spotsylvania County Government.

3. Bidder:
One who submits a competitively priced offer in response to an Invitation for Bids (IFB).

4. Informality:
A minor defect of variation in a bid or proposal from the exact requirements of the Invitation to Bid, or the Request for Proposal, which does not affect the price, quality, quantity or delivery schedule for the goods, services or construction being procured.

K. Drug-Free Workplace

During the performance of this contract, the Contractor agrees to (i) provide a drug-free workplace for the Contractor’s employees; (ii) post in conspicuous places, available to employees and applicants for employment, a statement notifying employees that the unlawful manufacture, sale, distribution, dispensation, possession, or use of a controlled substance or marijuana is prohibited in the Contractor’s workplace and specifying the actions that will be taken against employees for violations of such prohibition; (iii) state in all solicitations or advertisements for employees placed by or on behalf of the contractor that the contractor maintains a drug-free workplace; and (iv) include the provisions of the foregoing clauses in every subcontract or purchase order of over $10,000, so that the provisions will be binding upon each subcontractor or vendor.
For the purposes of this section, “drug-free workplace” means any site at which the performance of work is done in connection with this contract awarded to the Contractor, the employees of whom are prohibited from engaging in the unlawful manufacture, sale, distribution, dispensation, possession or use of any controlled substance or marijuana during the performance of the contract.

L. Ethics in Public Contracting

The Contractor hereby certifies that it has familiarized itself with Article 6 of Title 2.2 of the Virginia Public Procurement Act, Section 2.2-4367 through 2.2-4377, Virginia Code Annotated, and that all amounts received by it, pursuant to a Contract resulting from this IFB, are proper and in accordance herewith. By submitting a response to this solicitation, bidder certifies that their bid is made without collusion or fraud that they have not offered or received any kickbacks or inducements from any other bidder, supplier, manufacturer or subcontractor in connection with their bid, and that they have not conferred on any public employee having official responsibility for this procurement transaction any payment, loan, subscription, advance, deposit of money, services or anything of more than nominal value, present or promised, unless consideration of substantially equal or greater value was exchanged.

M. Examination of Records

The Contractor agrees that Spotsylvania County or any duly authorized representative shall have access to and the right to examine any and copy any directly pertinent books, documents, papers and records of the Contractor involving transactions related to any Contract resulting from this IFB. The period of access provided in this paragraph for records, books, documents, and papers and software which may be related to any arbitration, litigation, or the settlement of claims arising out of the performance of any subsequent contract or any subsequent Contracts with vendors shall continue until disposition of any appeals, arbitration, litigation, or claims. Contractors agrees to keep all records in accordance with the state and local retention laws including but not limited to Virginia Code § 55-525.27.

N. Faith-Based Organizations

Pursuant to Section 2.2-4343.1 of the Code of Virginia of 1950, in all invitations to bid, requests for proposals, contracts, and purchase orders, the COUNTY does not discriminate against faith-based organizations.

“Faith-based Organization” means a religious organization that is or applies to be a contractor to provide goods or services for programs funded by the block grant provided pursuant to the Personal Responsibility and Work Opportunity Reconciliation Act of 1996, P.L. 104-193.

If CONTRACTOR is a faith-based organization, then Contractor shall give to each individual who applies for or receives goods, services, or disbursements provided pursuant to this Agreement the following notice:

NOTICE
Pursuant to Section 2.2-4343.1 of the Code of Virginia of 1950, as an applicant for or recipient of goods, services, or disbursements provided pursuant to a contract between the COUNTY and a faith-based
organization, you are hereby notified as follows:

Neither the COUNTY’S selection of a charitable or faith-based provider of services nor the expenditure of funds under this contract is an endorsement of the provider’s charitable or religious character, practices, or expression. No provider of services may discriminate against you on the basis of religion, a religious belief, or your refusal to actively participate in a religious practice. If you object to a particular provider because of its religious character, you may request assignment to a different provider. If you believe that your rights have been violated, please discuss the complaint with your provider or notify the COUNTY Administrator.

O. Federal-Aid Provisions

When the U. S. government pays all or any portion of the cost of a project, the Contractor shall observe all federal laws, rules, and regulations made pursuant to such laws. The work shall be subject to inspection by the appropriate federal agency. Such inspection shall in no sense make the federal government a party of the contract and will in no way interfere with the rights of either party. Contractor shall require all subcontractors to observe all federal laws, rules, and regulations made pursuant to such laws. Reporting requirements that is part of the regulation shall be followed in accordance with the federal law, rules and/or regulation made pursuant to such laws. A Duns number will be provided by the Contractor and registration with the Central Contractor Registration (CCR) shall be followed according to the federal aid provisions.

P. Force Majeure

In any contract resulting from this IFB, neither party shall be liable hereunder by reason of any failure or delay in the performance of its obligations hereunder (except for the payment of money) on account of strikes, industry wide material shortages, riots, insurrection, fires, flood, storm, explosions, earthquakes, pandemic flu, acts of God, war, governmental action, and labor conditions. In the case of an industry wide material shortage the Contractors shall provide to the County within 24 hours of Contractor’s determination that there exists an industry wide material shortage, the following: 1) a written description of the specific material alleged to be in short supply; 2) a written list of all manufacturers, wholesalers, suppliers and/or retailers from which Contractor has attempted to obtain, and/or contracted to obtain, said material; 3) a written description detailing all actions taken by Contractor to obtain said materials; 4) a written statement, signed by an authorized representative of Contractor, that Contractor has used due diligence to secure said materials in the most expeditious manner; 5) a written time frame in which Contractor anticipates that it will obtain said materials and; 6) the County, or its authorized representative, concurs that there is an industry wide shortage of the specific material so identified by contractor.

Q. Freedom of Information

All information submitted to the County in response to this IFB will constitute public information and pursuant to the Virginia Freedom of Information Act will be available to the public for inspection upon request. Pursuant to Virginia Code § 2.2-4342 and County Procurement Policy § 3-27, a Bidder may request an exception to disclosure for trade secrets or proprietary information as such is defined under Virginia Code § 59.1-336, part of the Uniform Trade Secrets Act. In order to claim this exemption, a Bidder must: (1) Submit a request in writing referencing their desire to invoke the protections of Virginia Code § 2.2-4342; (2) Specifically identify which data or materials they wish to have protected; and (3) Articulate the rationale
for why protection is necessary for the particular data or materials, to the satisfaction of the County. Failure

to meet these requirements will result in the data or materials being open for inspection in response to a valid
inquiry under the Virginia Freedom of Information Act and serve to waive any right of the Bidder to assert a
claim against the County for disclosure of trade secrets or proprietary information.

R. Governing Law

In any contract resulting from this IFB, the parties agree that this agreement is governed by and shall be
interpreted in accordance with the Spotsylvania County Procurement Policy and the laws of the
Commonwealth of Virginia, including the Spotsylvania County Procurement Policy, and that proper venue,
in the event of litigation concerning this matter, shall be in the Circuit Court of Spotsylvania County,
Virginia. The parties agree that any litigation involving this Agreement shall be brought only in such court.

S. Grant Funds Provision

When a project is funded in part or all by grant funds, the Contractor shall observe all rules and regulations
according to the grant fund award documentation. Contractor has the responsibility to comply with all grant
fund reporting requirements and any or all award documentation terms and conditions.

T. Headings

Headings in the IFB and any resulting contract are informational only and the substance of each numbered or
lettered provision shall prevail in the event of any ambiguity or inconsistency between a heading and its
content.

U. IFB and Bid Clarification

Spotsylvania County reserves the right to request clarification of information submitted and to request
additional information of one or more bidders. Each bidder shall examine the IFB and shall judge all matters
relating to the adequacy and accuracy of such IFB. Any inquiries, suggestions or requests concerning
interpretation, clarification or additional information pertaining to the IFB shall be submitted in writing to
the Spotsylvania County Procurement contact listed on the first page of this IFB. Spotsylvania County shall
not be responsible for oral interpretations given by an employee, representative, agent, or others. The
issuance of a written IFB Addendum issued by the Spotsylvania County Procurement Division is the only
official method whereby interpretation, clarification, or additional information can be issued.

V. Insurance

During the performance of any contract resulting from this IFB, the Contractor shall have and keep current
insurance whichever is greater in scope or amount as follows:

(1) Worker’s Compensation Insurance in compliance with all states in which the Contractor does
business, including coverage B Employer’s Liability in not less that the following amounts:
   a. i  Bodily Injury by accident, $100,000 for each accident;
b. ii Bodily Injury by disease, $500,000 policy limit;

c. iii Bodily Injury by disease, $100,000 for each employee;

(2) General Liability Insurance in amount not less than $1,000,000 for any occurrence involving bodily injury, and not less than $1,000,000 for any occurrence involving property damage. This coverage shall include contractual liability, broad form property damage, independent contractors, and personal injury;

(3) Automobile Liability Insurance in an amount not less than $1,000,000 combined single limit bodily injury and property damage. This coverage shall include liability for the use of hired and non-owned vehicle.

The General Liability and Automobile Liability insurance policies specified herein shall name Spotsylvania County as additional insured with regard to work performed under any contract resulting from this IFB. The Contractor shall provide Spotsylvania County with copies of certificates of insurance coverage and proof of payment of all premiums. These certificates shall have provisions for notifying Spotsylvania County if there is any change in liability insurance.

The insurance required shall have been issued by a company rated “A” as reported in the current edition of Best’s Key Rating Guide, published by Alfred M. Best Company, Inc.

W. Interpretation

Words of any gender used in a resulting contract shall be held and construed to include any other gender, and words in the singular number shall be held to include the plural, and vice versa, unless the context otherwise requires.

X. Non-Collusion

The party submitting the foregoing IFB hereby certifies that such IFB is genuine and not collusive or sham; that said bidder has not colluded, conspired, connived or agreed, directly or indirectly, with any bidder or person, to put in a sham bid or to refrain from bidding, and has not in any manner, directly or indirectly, sought by agreement or collusion, or communication or conference, with any person to fix the bid price or affiant or of any bidder, or to fix any overhead, profit or cost element of said IFB price, or of that of any other bidder, or to secure any advantage against the County or any person interested in the proposed contract; and that all statements in said IFB are true.

Y. Non-Discrimination

Any contract resulting from this IFB and every contract, sub-contract, or purchase order there under shall include the following provisions according to 2.2-4311 Code of Virginia:

During the performance of a contract, the Contractor agrees as follows:
i. The contractor will not discriminate against any employee or applicant for employment because of race, religion, color, sex, age, or national origin, except where religion, sex or national origin is a bona fide occupational qualification reasonably necessary to the normal operation of the Contractor. The Contractor agrees to post in conspicuous places, available to employees and applicant for employment, notices setting forth non-discrimination clause.

ii. The Contractor, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, will state that such contractor is an equal opportunity employer.

iii. Notices, advertisements, and solicitations placed in accordance with federal law, rule or regulation shall be deemed sufficient for the purpose of meeting the requirement.

The Contractor will include the provisions in the foregoing paragraphs a, b, and c in every contract, subcontract, or purchase order of over $10,000, so that the provisions will be binding upon each subcontractor or vendor associated with Spotsylvania County.

Z. Partial Invalidity

In the event any one or more of the provisions of a contract resulting from this IFB are found by a court of competent jurisdiction to be invalid or unenforceable, the remaining provisions of the contract shall remain in full force and effect.

AA. Release and Ownership of Information

Spotsylvania County shall make a good faith effort to identify and make available to the Contractor all non-confidential technical and administrative data in Spotsylvania County’s possession which Spotsylvania County may lawfully release including, but not limited to contract specifications, drawings, correspondence, and other information specified and required by the Contractor and relating to its work under this Contract. Spotsylvania County reserves its rights of ownership to all material given to the Contractor by Spotsylvania County and to all background information, documents, and computer software and documentation developed by the Contractor in performing any Contract resulting from this IFB.

No reports, information or data given to or prepared by the Contractor under the resulting Contract shall be made available to any individual or organization by the Contractor without the prior written approval of Spotsylvania County, which approval Spotsylvania County shall be under no obligation to grant.

As may be allowed by law, any information, ideas, or concepts that the County receives during the procurement process from any bidder’s IFB response, any discussion or interview with the bidder or as a result of any portion of the procurement process for the services described in this Invitation for Bid shall become the property of Spotsylvania County. Spotsylvania County may use this information for any purpose without compensation to the bidder from whom the information was received.

BB. Rights and Responsibilities of Contractor

The Contractor shall indemnify, defend and hold harmless the County and its representatives from any and
all claims, suits and actions for injury or damage sustained by any person or property from any act or omission by Contractor and/or its Contractors or employees, or anyone else for whom Contractor is or may be responsible. This section shall survive the termination of this agreement.

The Contractor in any contract resulting from this IFB shall pay all royalties and license fees necessary for performance of the contract. The Contractor shall defend all suits or claims for infringement of any patent rights or any other proprietary rights arising from or related to performance of the resulting contract and shall save Spotsylvania County harmless from any and all loss, including reasonable attorneys' fees, on account thereof.

CC. Subcontractor and Assignments

The Contractor shall not sublet or assign or transfer any interest in this Contract or any portion thereof without the prior written consent of Spotsylvania County of which Spotsylvania County shall be under no obligation to grant. In seeking consent for any subcontract or assignment, the Contractor shall furnish all information required by Spotsylvania County to permit Spotsylvania County to ascertain the qualifications of the proposed Subcontractor to perform the work, and the Contractor shall submit a copy of the subcontract to Spotsylvania County for approval. The subcontractor shall incorporate by reference all provisions and conditions of the contract resulting from this solicitation.

Spotsylvania County’s approval of a Subcontractor shall not relieve the Contractor of any of its responsibilities, duties or liabilities hereunder. The Contractor shall continue to be responsible to Spotsylvania County for performance of the Subcontractor and the Subcontractor, for all purposes, shall be deemed to be an agent or employee of the Contractor. Nothing in the Contract resulting from this RFP or any subcontract shall create any contractual relationship between any Subcontractor and Spotsylvania County.

DD. Tax Exemption

The County of Spotsylvania as a public body politic and corporate of the Commonwealth of Virginia, is exempt from any Federal excise tax and Virginia sales and use tax for purchases made by the County.

EE. Termination

Spotsylvania County shall have the right to terminate at Spotsylvania County’s convenience, with or without cause, any contract resulting from this IFB by specifying the date of termination in a written notice. In this event, the Contractor shall be entitled to just and equitable compensation for any authorized satisfactory work done or any items/materials accepted by Spotsylvania County.

GG. Testing and Inspection

Spotsylvania County reserves the right to conduct any test/inspection it may deem advisable to assure goods and services conform to the specifications prior to award.

HH. Transportation and Packaging
By submitting their bid, all bidders certify and warrant that the price offered for FOB destination includes only the actual freight rate costs at the lowest and best rate and is based upon the actual weight of the goods to be shipped.
ATTACHMENT A

SPOTSYLVANIA COUNTY
PROJECT MANUAL

Massaponax Interceptor Replacement Phase IV

INVITATION FOR BID (IFB #20-03-EG)

June, 2019
MASSAPONAX INTERCEPTOR REPLACEMENT

AMERICAN CENTRAL BRANCH

PHASE 4A

PROJECT MANUAL

SPOTSYLVANIA COUNTY, VIRGINIA

Prepared for:
County of Spotsylvania, Virginia
Department of Utilities
600 Hudgins Road
Fredericksburg, Virginia 22408

Prepared by:
Whitman Requardt & Associates, LLP
9030 Stony Point Parkway
Suite 220
Richmond, Virginia 23235
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Appendix A – Geotechnical Boring Logs

Appendix B – Permit Conditions and Requirements

- Corps of Engineers – Nationwide 12 Permit and Conditions
- Virginia Department of Environmental Quality – General VPDES Permit for Discharges of Stormwater from Construction Activities (General Permit VAR10)
SECTION 01010
SUMMARY OF WORK

PART I - GENERAL

1.01 SUMMARY

A. Related documents: Conditions of the Contract addenda, this section and other sections of Division 1 – General Requirements, apply to the entire work of the contract.

1.02 WORK COVERED BY THE CONTRACT DOCUMENTS

Work under the contract documents includes, but is not limited to, furnishing and installing gravity sewer, water main and associated appurtenances is as follows:

A. Phase 4A:

1. Furnish, erect, maintain and remove erosion and sediment control measures including silt fencing, turbidity curtain, dewatering structures, permanent seeding, and others items as required.

2. Clear and grub the temporary construction easement and the permanent utility easement.

3. Clear and stockpile native plants from designated wetland areas within the temporary construction and permanent utility easements. Provide maintenance of stockpiled plants during construction including watering and protection.

4. Furnish and install 24-inch and 18-inch diameter gravity sewer at the locations, inverts and grades shown on the plans.

5. Furnish and install 12-inch diameter gravity sewer at the locations, inverts and grades shown on the plans.

6. Furnish and install 8-inch diameter gravity sewer at the locations, inverts and grades shown on the plans.

7. Furnish and install 12-inch diameter ductile iron pipe water pipe to replace the existing 12-inch diameter Asbestos Cement waterline at the locations shown on the plans.
8. Furnish and install precast manholes and precast drop manholes (of various sizes) at the locations and inverts shown on the plans.

9. Furnish, install and remove pumps, hoses, plugs, fuel, personnel and other items required for sanitary sewage by-pass pumping at the locations required.

10. Furnish, erect, maintain and remove temporary vehicular stream crossings for crossings of Massaponax Creek.

11. Furnish, install and remove temporary stream dams for utility stream crossings of Massaponax Creek.

12. Furnish and install stream bank stabilization.


14. Connect the new 24-inch diameter gravity sewer to the existing manhole at the start of the project.

15. Fine grade, seed and mulch temporary construction easement and the permanent utility easement.

16. Fine grade and restore wetland areas.

17. Furnish and install 1-inch air release valve and manhole for proposed 12-inch water main.

B. Work consists of providing labor, materials, equipment, services and administration required in conjunction with or properly incidental to construction of the project. All work shall be performed in accordance with Federal, State and Local regulations and OSHA requirements.

C. Consideration will not be given for misunderstanding the amount of work to be performed. Work includes all items and conditions specified, indicated in the specifications or required by nature of the building or site. Any questions on the Scope of Work should be submitted to the Department of Utilities as specified in Section 00100, Information for Bidders. Questions that arise during the Construction Phase should be submitted in writing to the Engineer for resolution.

PART II PRODUCTS (Not Used)

PART III EXECUTION (Not Used)

END OF SECTION
SECTION 01050

FIELD SERVICES

PART I - GENERAL

1.01 SCOPE OF WORK

A. Work contained in this section consists of furnishing all labor, tools, equipment and services necessary to provide all field services required in the execution of the work including but not limited to: surveying, staking, establishment of horizontal and vertical controls and any other incidental items required for the proper completion of the work.

1.02 QUALITY ASSURANCE

A. The Contractor shall retain the services of a registered Land Surveyor, licensed in the Commonwealth of Virginia, to identify existing control points and maintain a survey during construction.

B. The method of field staking for the construction of the work shall be at the option of the Contractor.

C. The accuracy of any method of staking shall be the responsibility of the Contractor. All engineering for vertical and horizontal controls shall be the responsibility of the Contractor.

D. The Contractor shall be responsible for the preservation of all stakes and marks. If any stake or mark is carelessly or willfully disturbed by the Contractor, the Contractor shall not proceed with any work until he has reestablished such points, marks, lines and elevations as may be required for the prosecution of the work.

E. Civil, structural or other professional engineering services specified or required to execute Contractor’s construction methods shall be obtained by the Contractor at no additional cost to the Owner.

1.03 QUALIFICATIONS OF SURVEYOR OR ENGINEER

A. Registered Professional Engineer, of the discipline required for the specific service, shall be currently licensed in the Commonwealth of Virginia.

B. Registered Land Surveyor shall be currently licensed in the Commonwealth of Virginia.
C. Professional Engineer and Land Surveyor shall be submitted to the Spotsylvania County Department of Utilities for review and approval.

1.04 SURVEY REFERENCE POINTS

A. Locate and protect control points prior to starting site work and preserve all permanent reference points during construction.

1. Make no changes or relocation of the reference points without prior written notice of the Engineer.

2. Report to the Engineer when any reference point is lost or destroyed, or requires relocation because of necessary changes in grades or locations.

3. Require the surveyor to replace Project control points that may be lost or destroyed at no additional cost to the Owner.

1.05 PROJECT SURVEY REQUIREMENTS

A. Establish permanent benchmarks, at a maximum spacing of 2500 feet, along the alignment. Permanent benchmarks shall be referenced to data established by survey control points.

B. Record the location of the permanent benchmarks, with horizontal and vertical data, on the Project Record Documents.

C. Establish lines and levels, locate and lay out, by instrumentation and similar appropriate means:

1. Site improvements:
   a. Stakes for grading, fill and topsoil replacement.
   b. Utility slopes and invert elevations.

2. Batter boards for structures.

3. Structure foundations and floor levels.

D. Periodically, verify layouts by same methods.

1.06 RECORDS

A. Maintain a complete, accurate log of all control and survey work as it progresses.
B. At the end of the Project, submit a certified site survey, at 1” = 40’ scale, on 24”x 36” indicating the centerline of the force main, water main, gravity sewer and the centerline of all manholes. The County will authorize Sullivan, Donahoe & Ingalls (SDI) to perform the as-built survey for the utilities and manholes. The contractor is required to perform all other as-built and record notations and to incorporate data provided by SDI into the as-built submission to the Owner and Engineer.

1.07 SUBMITTALS

A. Submit names and addresses of the Surveyor and Professional Engineer to the Engineer.

B. On request of the Engineer, submit documentation to verify accuracy of field engineering work.

C. On request of the Engineer, submit documentation to verify accuracy of field measuring and survey equipment.

D. Submit certificate, signed by registered engineer or surveyor, certifying that the elevations and locations of improvements are in conformance, or non-conformance, with the Contract Documents.

E. Submit drawings showing locations of all structures constructed. This drawing shall be included with the Project Record Documents.

PART II - PRODUCTS  (Not Used)

PART III - EXECUTION  (Not Used)

END OF SECTION
SECTION 01106
CONSTRUCTION SCHEDULING, COORDINATION AND SEQUENCING

PART 1 - GENERAL

1.01 GENERAL REQUIREMENTS

A. Construction work under this contract shall have the least amount of interferences with the operations of existing facilities. Existing facilities must be maintained in continuous operation at all times during the course of the work under this contract.

B. Operation of all valves required to perform the work shall be done by the Owner. The Owner, or his designated agent, shall be informed in writing at least 48 hours, or longer where specified, in advance of the need to operate valves or other actions which could affect system operations.

C. To achieve reliable, continuous operation, new equipment and facilities shall be tested and in operating condition before final tie-ins are made which connect new equipment and facilities to the existing system.

D. The Contractor shall submit to the Engineer, drawings showing details of all temporary connections or facilities as required.

E. When removing a facility from service, the Contractor shall allow the facility to drain naturally or be pumped to its lowest level. All remaining fluids shall be removed by the Contractor at his expense. Solids shall be properly disposed of off-site by the Contractor at his expense. Disposal of these solids must be in accordance with federal, state and local codes.

F. No extra payment shall be made for any labor, materials, tools, equipment or temporary facilities required during the construction of facilities. All costs therefore shall be considered to have been included in the price bid of the Proposal.

1.02 SEQUENCE OF CONSTRUCTION

A. A plan for the sequence of construction and delivery dates is necessary to keep shutdowns and the construction to a minimum. The Contractor shall develop a sequence of construction and submit it to the Owner and Engineer for review and approval. The plan shall include all work to be performed and shall be broken down to allow coordination with “Requests for Payment”. The Sequence of Construction shall be such that all work under this contract shall be completed within the construction time stated in these specifications. Temporary by-pass pumping, when required, shall be at the Contractor’s expense.
1.03 FACILITY SHUTDOWNS

A. Temporary shutdown periods shall not extend more than 8 hours.

B. Scheduled shut downs shall be mutually agreed upon by the Owner and the Contractor, with the Engineer's approval.

C. Contractor shall notify each resident, business and/or facility to be affected by the shutdown. Notification shall include the date of the shutdown and the expected duration of the shutdown. Notification shall be mailed or delivered at least seven (7) days prior to the shutdown.

D. In order to keep each shutdown period to a minimum, the Contractor shall, prior to each shutdown, expedite completion of the work to the fullest extent. The Contractor shall have completed all necessary preparatory work including testing and shall have adequate personnel available to keep each shutdown period to a minimum. All equipment and materials required to complete the work during a shutdown period shall be on the job site before the shutdown is commenced.

E. The Contractor shall carefully coordinate all work and schedules and shall provide the Owner and Engineer with 10 calendar days minimum written notice prior to each shutdown period, unless otherwise approved by the Owner.

F. Prior to a shutdown, the Contractor shall submit to the Engineer and Owner in writing, detailed descriptions and schedules of the proposed construction procedures during the shutdown period. Information submitted to the Engineer shall include a complete inventory of materials and equipment needed to perform the work. No shutdown of a facility or operation will be permitted until the Engineer has reviewed and approved, in writing, the proposed construction plans and procedures.

G. If, during any temporary shutdown periods, the work performed is not satisfactory, as planned, or not completed with the maximum time allocated, the Owner may order the Contractor to place the facility back in service and reschedule the work, or he may order the work required to place the facility or operation back in service to be performed with other forces.

H. During scheduled shut downs the Contractor shall be responsible for all damages and costs thereof due to negligence.

1.04 COORDINATION

A. Contractor, Subcontractors and Owner Personnel
1. The Contractor is responsible for the proper coordination of his work and his subcontractor's work, to assure timely completion of the work and to assure that the Owner is made aware in advance of proposed construction activities.

2. There will be no basis for claim for extra compensation or contract time extension due to delay caused by the Contractor's failure to give proper notice for requested shutdowns or to advise the Owner of proposed construction activities that in the judgement of the Owner will interfere with operation of the distribution system.

3. Should an emergency condition arise, the Owner has the authority to require the Contractor and his subcontractors to suspend their operations temporarily until conditions return to normal, without claim for extra cost or contract time extension by the Contractor and his subcontractors.

B. Subcontractors

1. Where the work of any subcontractor will be installed in close proximity to work of other subcontractors, or where there is evidence that the work of any subcontractor will interfere with the work of other subcontractors, the Contractor shall work out space allocations to make a satisfactory adjustment. If so ordered by the Engineer, the Contractor shall prepare composite working drawings and sections at a suitable scale, not less than 1/4 inch equals 1 foot, clearly showing how work is to be installed in relation to the work of others. If the Contractor permits any work to be installed before coordinating with the various subcontractors; or so as to cause interference with work of other subcontractors, he shall make necessary changes in the work to correct the condition without extra cost to the Owner.

2. The Contractor shall arrange that each subcontractor determines the location, size and arrangement of all chases and openings and shall establish clearances in concealed spaces required for the proper installation of its work and shall see that such are provided.

1.05 PERMITS

A. Army Corps of Engineers (USACOE) Nationwide Permit

1. The Owner has obtained a Nationwide 12 and 13 Permit for the construction activities and restoration activities in all wetland areas and stream crossings. The permit conditions are included in Appendix B as part of the Contract Documents. The Contractor shall abide by the conditions and requirements stipulated in the permit conditions.

2. Contractor shall be responsible to obtain the necessary permit modification
from the USACOE for additional access, stockpile, and/or storage locations impacting wetlands or Waters of the U.S. not included on the Contract Drawings at no additional expense to the Owner.

B. Erosion and Sediment Control, Land Disturbance Permit

1. The design plans have been reviewed by the County’s Environmental Engineering Department. No outstanding review comments are pending.

2. The County will obtain a land disturbance permit from the Code Compliance section of the County’s Environmental Engineering Department. The Contractor is required to provide the appropriate information regarding the Registered Land Disturber for the project. The Contractor will also be required to pay the permit processing fee.

C. Virginia Department of Conservation and Recreation (DCR) – Stormwater Management Program General Permit for Construction Activity

1. The Contractor is required to abide by the requirements of the Stormwater Management Program General Permit for Construction Activity from the DCR. The County will pay the permit fee, submit the permit application and sign the appropriate certification. The Contractor is required to prepare and maintain a Stormwater Pollution Prevention Plan (SWPPP) as required by the permit and County’s Code Compliance.

D. Building Permits

1. The Contractor will be responsible for obtaining and paying for all necessary Building Permits.

1.06 MASSAPONAX CREEK CROSSINGS

A. For crossings of Massaponax Creek the Contractor must comply with the requirements listed in the USA Corps of Engineers Joint Permit conditions issued for the project. Copies of the above referenced permits are included in Appendix B.

B. Identified below are the significant conditions of the permits that must be satisfied by the Contractor. The list below does not cover all of the requirements of the permits. The Contractor is responsible for meeting the requirements of all the conditions of the issued permits.

1. Provide submittals to the Engineer for each stream crossing identified on Contract Drawings. The submittals will outline the construction measures, sequence of construction and temporary erosion and sediment control measures to be employed for each stream crossing. Contractor shall ensure
that construction measures and sequence to be employed for all stream crossings follow the USACOE permit conditions and the Virginia Erosion and Sediment Control Handbook.

2. Notify the County’s Code Compliance Section at least 24 hours in advance of any stream crossings. Provide stream bank stabilization immediately after installations and acceptance by Owner.

PART 2 - PRODUCTS
Not used.

PART 3 - EXECUTION
Not used.

END OF SECTION
SECTION 01130
MEASUREMENT AND PAYMENT

PART I - GENERAL

1.01 GENERAL

A. The Contractor shall receive and accept the compensation provided in the Proposal and the Contract as full payment for furnishing all labor, materials, tools, equipment and services for performing all operations necessary to complete the Work under the Contract, and also in full payment for all loss or damages arising from the nature of the Work, or from any discrepancy between the actual quantities of work and the quantities herein estimated, altered or revised by the Engineer or Owner, or from action of the elements or from any unforeseen difficulties which may be encountered during the prosecution of the Work until the final acceptance by the Owner.

B. The prices stated in the Proposal include all costs and expenses for taxes, labor, equipment, materials, commissions, transportation, patent fees and royalties, labor for handling materials during inspection, together with any and all other costs and expenses for performing and completing the Work as shown on the Contract Drawings and specified herein. The basis of payment for an item at the lump sum price in the Proposal shall be in accordance with the description of that item in this section.

C. The Contractor’s attention is called to the fact that the quotations for the various items of the Work are intended to establish a total price for completing the Work in its entirety. Should the Contractor feel that the cost for any item of work has not been defined by a Bid Form Pay Item, he shall include the cost for that work in some other applicable bid item, so that his proposal for the Work reflects his total price for completing the Work in its entirety.

D. Items listed as CONTINGENT UNIT PRICE ITEMS in the proposal are to be used and will be paid for only at the written direction and authorization of the Engineer, if agreed to by the Owner. Payment under this section will be made for materials furnished and placed in addition to those shown or beyond the limits indicated or reasonably inferred by the Contract Documents. Measurement and payment will be in accordance with the Proposal and will include, but not necessarily be limited to, furnishing, hauling, placing and installing of materials and the furnishing of such manpower and equipment as required to accomplish the work as directed in writing by the Engineer.
E. Alterations

1. The Owner reserves the right to change the alignment, grade, form, length, dimensions or materials of the Work under the Contract, whenever conditions or obstructions are met that render the changes desirable or necessary. All such alterations shall be paid for under the total lump sum bid or at a unit price bid for these items of work, except as follows:

   a. In the case that such alterations make the Work less expensive to the Contractor, a proper deduction shall be made from the contract prices and the Contractor shall have no claim on this account for damages or for anticipated profits on the work that may be dispensed with.

   b. In the case such alterations make the Work more expensive to the Contractor, a proper addition shall be made to the contract prices in accordance with the provisions of the General Conditions.

   c. Any additions or subtractions to the contract prices shall be proposed by the Contractor and then reviewed by the Engineer and approved by the Owner.

   d. In case the quantity of Work in individual unit price items of work increases or decreases greater than 25% of the bid quantity, unit prices may be renegotiated.

F. Engineer May Increase or Decrease Quantities

1. The Engineer reserves the right to increase or decrease the quantity of material to be furnished or work to be done under the Contract whenever he deems it advisable or necessary. Such increase or decrease shall in no way violate or invalidate the Contract.

2. For the unit price items included in the bid, the Contractor will be paid for the actual amount of the authorized work done or material furnished under each item of the Proposal, at the unit price bid for that item. In case the quantity of any item is increased by less than 25%, the Contractor shall not be entitled to compensation over and above the unit price bid for each item. In case the quantity is decreased by less than 25%, the Contractor shall have no claim for damages on account of loss of anticipated profits because of such decrease.

3. For the contingency items, the Contractor shall be paid for actual quantities installed, on written order of the Engineer.

G. Except as modified herein, measurement and payment shall be in accordance with the General Conditions, Article 15 – Payments and Completion.
1.02 **MEASUREMENT**

A. The quantities for payment under this Contract shall be determined by actual measurement of the completed items, in place and accepted by the Owner, in accordance with the General Conditions. A representative of the Contractor shall witness all field measurements.

1.03 **PAYMENT**

A. Payments during the course of the Work for unit price items will be made on the basis of actual amount of the work item installed at the end of the pay period. Determination of the amount of the work item listed in the Schedule of Values installed shall be made by the Contractor and reviewed and approved by the Engineer. Payments during the course of the Work for lump sum items will be made on the basis of percentage of completion of the work items listed in the Schedule of Values for each lump sum item. The Schedule of Values shall be prepared by the Contractor and submitted to the Engineer within 15 days of the execution of the Contract and shall serve as a breakdown of the lump sum bid for the purpose of arriving at a basis for the monthly estimate. The Schedule of values shall be broken down into categories and each category further broken down into each applicable specification section. The schedule shall add up to 100% of the Lump Sum Bid.

B. Example (not including all bid items):

1. Mobilization
2. Clearing and Grubbing
3. 12” Dia. Ductile Iron Pipe Water Pipe
4. 24” Dia. Gravity Sewer Pipe
5. 12” Dia. Gravity Sewer Pipe
6. 8” Dia. Gravity Sewer Pipe
7. Precast Concrete Manholes
8. Utility Stream Crossings
9. Sanitary Pumping Station Decommissioning, etc.

1.04 **LUMP SUM AND UNIT PRICE ITEMS**
A. Item A-1: Mobilization

1. Lump sum cost to mobilize/demobilize labor, materials, tools and equipment to perform the work shown on the Contract Drawings and specified in the Specifications.

2. No measurement shall be made for mobilization.

3. Lump sum cost for mobilization shall include such items as bonds, insurance, stakeout, equipment and labor mobilization/demobilization, field office, progress photographs, project sign, permits, shop drawings, Contractor’s test pits and other incidental items required prior to commencement of construction.

4. Mobilization shall not exceed 5.0% of the total price bid for items listed under Part A in the Schedule of Prices (exclusive of item A-1). Application for payment of mobilization may be made on the basis of 50% for first pay application, 40% for second pay application, and 10% for final pay application.

B. Item A-2: Construction Entrance, Complete

1. Payment for furnishing, installing, operating and removing a construction entrance shall be made at the unit price bid per each for each construction entrance actually installed and removed.

2. No measurement shall be made. Payment shall not be made until the construction entrance has been removed.

3. The unit price bid per each shall include all labor, materials, tools, equipment and services for furnishing, installing and removing each construction entrance including, but not limited to; field surveying, stone, geotextile underlayment as required, subgrade preparation, locating and supporting existing utilities, maintenance, disposal of rock and unsuitable soils, discharges, restoration and any other incidental items required for the proper operation of the construction entrance.

C. Item A-3: Clearing and Grubbing, Complete

1. Payment for clearing and grubbing shall be made at the unit price bid per acre for the acres actually cleared and grubbed.

2. Measurement for acreages cleared and grubbed shall be made along the centerline of the permanent utility easement. The length shall then be
multiplied by the combined widths of the temporary and permanent easements to obtain the area cleared and grubbed.

3. The unit price bid per acre shall include all labor, materials, tools, equipment and services for clearing and grubbing the permanent utility easement and the temporary construction easement to limits shown on the plans and in accordance with the specifications and the installation of any required tree protection.

D. Item A-4: Silt Fence, Complete, In-Place

1. Payment for furnishing, installing and removing silt fencing shall be made at the unit price bid per linear foot for lengths of silt fencing actually installed and removed. Payment will be made at 80% for the silt fence installation and the remaining 20% for the removal of the silt fence.

2. Measurement of lengths will be made horizontally, along the center of the silt fence.

3. The unit price bid per linear foot shall include all labor, materials, tools, equipment and services for furnishing and installing the silt fence including, but not limited to; field surveying, excavation, storage of excavated materials, backfill, installation of posts, installation of fence mesh, maintenance, locating and supporting existing utilities, disposal of rock and unsuitable soils, replacement as required, removal, and any other incidental items required for the proper operation of the silt fencing.

E. Item A-5: Super Silt Fence, Complete, In-Place

1. Payment for furnishing, installing and removing super silt fencing shall be made at the unit price bid per linear foot for lengths of super silt fencing actually installed and removed. Payment will be made at 80% for the super silt fence installation and the remaining 20% for the removal of the super silt fence.

2. Measurement of lengths will be made horizontally, along the center of the super silt fence.

3. The unit price bid per linear foot shall include all labor, materials, tools, equipment and services for furnishing and installing super silt fence including, but not limited to; field surveying, excavation, storage of excavated materials, disposal of rock and unsuitable soils, locating and supporting existing utilities, backfill, installation of posts, installation of fence mesh, maintenance, replacement as required, removal, and any other incidental items required for the proper operation of the super silt fencing.
F. Item A-6: Dewatering Structure, Complete

1. Payment for furnishing, installing, operating and removing dewatering structure shall be made at the unit price bid per each for each dewatering structure actually installed and removed. Payment will be made at 80% for the dewatering structure installation and the remaining 20% for the removal of the structure.

2. No measurement shall be made. Payment shall not be made until the dewatering structure has been removed.

3. The unit price bid per each shall include all labor, materials, tools, equipment and services for furnishing, installing and removing dewatering structure including, but not limited to; pumps, hoses, structure, stone, maintenance, discharge, restoration, removal and any other incidental items required for the proper operation of the dewatering structure.

G. Item A-7: Utility Stream Crossing, Complete, In-place

1. Payment for furnishing and installing utility stream crossings shall be made at the unit price bid per each for the stream crossings actually installed. Payment will be made at 80% for the utility stream crossing installation and the remaining 20% for the removal of the crossing.

2. No measurement shall be made. Payment shall not be made until the utility stream crossing is complete, tested and accepted.

3. The unit price bid per each shall include all labor, materials, tools, equipment and services for the utility stream crossing including, but not limited to; field surveying, excavation, storage, handling and use of excavated materials, disposal of rock and unsuitable soils, locating and supporting existing utilities, cofferdam or flume pipe installation and removal, temporary access roads, trench support, dewatering, handling and placing of drainage pipe, connections, removal, and any other incidental items required for the proper operation of the utility stream crossing.

H. Item A-8: Temporary Vehicular Stream Crossing, Complete, In-place

1. Payment for furnishing and installing temporary vehicular stream crossings shall be made at the unit price bid per each for the stream crossings actually installed. Payment will be made at 80% for the temporary vehicular stream crossing installation and the remaining 20% for the removal of the crossing.
2. No measurement shall be made. Payment shall not be made until the stream crossing is complete, tested and accepted.

3. The unit price bid per each shall include all labor, materials, tools, equipment and services for the stream crossing including, but not limited to; field surveying, excavation, storage, handling and use of excavated materials, locating and supporting existing utilities, disposal of rock and unsuitable soils, installation and removal of culverts, rip rap and stone, dewatering, temporary access roads, handling and placing of drainage pipe, connections, stone bedding, backfill, removal, and any other incidental items required for the proper operation of the temporary vehicular stream crossing.

I. Item A-9: Turbidity Curtain, Complete, In-Place

1. Payment for furnishing, installing and removing turbidity curtain shall be made at the unit price bid per linear foot for each inlet protection actually installed and removed. Payment will be made at 80% for the turbidity curtain installation and the remaining 20% for the removal of the curtain.

2. Measurement of lengths will be made horizontally, along the center of the turbidity curtain.

3. The unit price bid per linear foot shall include all labor, materials, tools, equipment and services for furnishing, installing and removing turbidity curtain including, but not limited to; field surveying, excavation, storage of excavated materials, disposal of rock and unsuitable soils, connections for curtain, anchoring system, inspection and maintenance, removal, disposal of sediment, restoration, removal, and any other incidental items required for the proper operation of the turbidity curtain.

J. Item A-10: Permanent Seeding, Complete, In Place

1. Payment for furnishing and installing permanent seeding shall be made at the unit price bid per acre for the amount permanent seeding actually placed.

2. Measurement for acres of permanent seeding shall be made along the centerline of the permanent utility easement. The length shall then be multiplied by the combined widths of the temporary and permanent easements (at 50 foot increments) or limits of clearing and grubbing where permanent seed was actually placed, to obtain the area of permanent seeding.
3. The unit price bid per acre shall include all labor, materials, tools, equipment and services for furnishing and installing permanent seeding including but not limited to; grading, handling and placing of topsoil, in wetland and non-wetland areas; handling and placing of seed in all disturbed areas; handling and placing of mulch; handling and placing of fertilizer and lime; watering; and any other incidental items required for proper growth in the seeded areas.

K. Item A-11: 24” Dia. PS 115 PVC Gravity Sewer, Complete, In-Place

1. Payment for furnishing and installing 24” diameter PS 115 PVC gravity sewer shall be made at the unit price bid per linear foot for the lengths of pipe actually installed.

2. Measurement of lengths shall be made horizontally, along the centerline of pipe. Deductions will be made in the measured length for manholes and structures.

3. The unit price bid per linear foot shall include all labor, materials, tools, equipment and services for furnishing and installing 24” diameter PVC gravity sewer including, but not limited to; field surveying, unclassified excavation, storage, handling, and reuse of excavated materials, backfill, trench support, dewatering, locating and supporting existing utilities, handling and placing of pipe, making of joints, connections, stone bedding, disposal of rock, excess and unsuitable soils, maintaining existing fences, surface feature restoration, traffic control, temporary signage, temporary blocking, concrete anchors, stub-outs, plugs, locating and supporting existing utilities, testing and any other incidental items required for the proper installation and operation of the gravity sewer.

L. Item A-12: 18” Dia. PS 115 PVC Gravity Sewer, Complete, In-Place

1. Payment for furnishing and installing 18” diameter PS 115 PVC gravity sewer shall be made at the unit price bid per linear foot for the lengths of pipe actually installed.

2. Measurement of lengths shall be made horizontally, along the centerline of pipe. Deductions will be made in the measured length for manholes and structures.

3. The unit price bid per linear foot shall include all labor, materials, tools, equipment and services for furnishing and installing 18” diameter PVC gravity sewer including, but not limited to; field surveying, unclassified excavation, storage, handling, and reuse of excavated materials, locating and supporting existing utilities, backfill, trench support, dewatering,
handling and placing of pipe, making of joints, connections, stone bedding, disposal of rock, excess and unsuitable soils, maintaining existing fences, surface feature restoration, traffic control, temporary signage, temporary blocking, concrete anchors, stub-outs, plugs, locating and supporting existing utilities, testing and any other incidental items required for the proper installation and operation of the gravity sewer.

M. Item A-13: 12” Dia. SDR 26 PVC Gravity Sewer, Complete, In-Place

1. Payment for furnishing and installing 12” diameter SDR 26 PVC gravity sewer shall be made at the unit price bid per linear foot for the lengths of pipe actually installed.

2. Measurement of lengths shall be made horizontally, along the centerline of pipe. Deductions will be made in the measured length for manholes and structures.

3. The unit price bid per linear foot shall include all labor, materials, tools, equipment and services for furnishing and installing 12” diameter PVC gravity sewer including, but not limited to; field surveying, unclassified excavation, storage, handling, and reuse of excavated materials, locating and supporting existing utilities, backfill, trench support, dewatering, handling and placing of pipe, making of joints, connections, stone bedding, disposal of rock, excess and unsuitable soils, maintaining existing fences, surface feature restoration, traffic control, temporary signage, temporary blocking, concrete anchors, stub-outs, plugs, locating and supporting existing utilities, testing and any other incidental items required for the proper installation and operation of the gravity sewer.

N. Item A-14: 8” Dia. SDR 26 PVC Gravity Sewer, Complete, In-Place

1. Payment for furnishing and installing 8” diameter SDR 26 PVC gravity sewer shall be made at the unit price bid per linear foot for the lengths of pipe actually installed.

2. Measurement of lengths shall be made horizontally, along the centerline of pipe. Deductions will be made in the measured length for manholes and structures.

3. The unit price bid per linear foot shall include all labor, materials, tools, equipment and services for furnishing and installing 8” diameter PVC gravity sewer including, but not limited to; field surveying, unclassified excavation, storage, handling, and reuse of excavated materials, locating and supporting existing utilities, backfill, trench support, dewatering, handling and placing of pipe, making of joints, connections, stone
bedding, disposal of rock, excess and unsuitable soils, maintaining existing fences, surface feature restoration, traffic control, temporary signage, temporary blocking, concrete anchors, stub-outs, plugs, locating and supporting existing utilities, testing and any other incidental items required for the proper installation and operation of the gravity sewer.

O. Item A-15: 12” Dia. DI Class 52 Water Main, Complete, In-Place

1. Payment for furnishing and installing 12-inch diameter DI water main shall be made at the unit price bid per linear foot for the lengths of pipe actually installed.

2. Measurement of lengths will be made horizontally, along the centerline of pipe.

3. The unit price bid per linear foot shall include all labor, materials, tools, equipment and services for furnishing and installing 12-inch DI water main including, but not limited to: field surveying, pavement removal; excavation; handling and storage of excavated materials; locating and supporting existing utilities, backfill; compaction; trench support; dewatering; removal and disposal of existing water main; handling and placing of new water pipe and fittings; disposal of rock, excess and unsuitable soils, making of restrained joints; couplings; stone bedding; pavement patching; temporary blocking; testing and any other incidental items required for the proper operation of the water main.

P. Item A-16: 12” Gate Valve and Box, Complete, In-Place

1. Payment for furnishing and installing 12-inch diameter gate valves with box shall be made at the unit price bid per each for each valve actually installed.

2. Measurement will be made per each valve and box installed at the locations shown on the plans and as directed by the Engineer.

3. The unit price bid per linear foot shall include all labor, materials, tools, equipment and services for furnishing and installing 12-inch diameter buried service gate valves and boxes including, but not limited to; field surveying, pavement removal, excavation, storage, and reuse of excavated materials, excavation and offsite disposal of rock, excess, and unsuitable soils; locating and supporting existing utilities, backfill, trench support, dewatering, handling and placing of valves, handling and setting of boxes, making of all connections, stone bedding, temporary blocking, testing and any other incidental items required for the proper operation of the valves.
Q. Item A-17: Fire Hydrant Assembly, Complete, In-Place

1. Payment for furnishing and installing a fire hydrant assembly at the locations shown on the plans shall be made at the unit price bid per each for each fire hydrant assembly actually installed.

2. Measurement will be made per each fire hydrant assembly installed at the locations shown on the plans and as directed by the Engineer.

3. The unit price bid per each shall include all labor, materials, tools, equipment and services for furnishing and installing a fire hydrant assembly including, but not limited to: field surveying, excavation and storage of excavated materials; excavation and offsite disposal of rock, excess and unsuitable soils; locating and supporting existing utilities, backfill; handling and connecting hydrant to pipe; 6-inch gate valve and box; fittings; making of all joints; stone bedding, temporary blocking, testing and any other incidental items required for the proper operation of the fire hydrant assembly.

R. Item A-18: 4'-0” Dia. Precast Concrete Manhole with Watertight Frame and Cover, Complete, In-Place

1. Payment for furnishing and installing 4'-0” dia. precast concrete manhole with watertight frame and cover shall be made at the unit price bid per each manhole actually installed.

2. Measurement shall be for each 4'-0” diameter precast concrete manhole with watertight frame and cover installed.

3. The unit price bid shall include all labor, materials, tools, equipment and services for furnishing and installing 4'-0” Dia. precast concrete manholes and riser sections including, but not limited to: field surveying, bypass pumping existing flows as required; pavement removal; excavation; storage, handling and use of excavated materials; disposal of rock, excess and unsuitable soils, locating and supporting existing utilities; backfill; compaction; trench support; dewatering; stone bedding; handling and placing of manhole sections; handling and setting of frames and covers; installation of liners; waterproofing; connections; pavement replacement; temporary blocking; testing and any other incidental items required for the proper operation of the manholes.

S. Item A-19: 5'-0” Dia. Precast Concrete Manhole with Watertight Frame and Cover, Complete, In-Place
1. Payment for furnishing and installing 5’-0” dia. precast concrete manhole with watertight frame and cover shall be made at the unit price bid per each manhole actually installed.

2. Measurement shall be for each 5’-0” diameter precast concrete manhole with watertight frame and cover installed.

3. The unit price bid shall include all labor, materials, tools, equipment and services for furnishing and installing 4’-0” Dia. precast concrete manholes and riser sections including, but not limited to: field surveying, bypass pumping existing flows as required; pavement removal; excavation; storage, handling and use of excavated materials; disposal of rock, excess and unsuitable soils, locating and supporting existing utilities; backfill; compaction; trench support; dewatering; stone bedding; handling and placing of manhole sections; handling and setting of frames and covers; installation of liners; waterproofing; connections; pavement replacement; temporary blocking; testing and any other incidental items required for the proper operation of the manholes.

T. Item A-20: 4’-0” Dia. Precast Concrete Drop Manhole with Watertight Frame and Cover, Complete, In-Place

1. Payment for furnishing and installing 4’-0” dia. precast concrete drop manhole with watertight frame and cover shall be made at the unit price bid per each manhole actually installed.

2. Measurement shall be for each 4’-0” diameter precast concrete drop manhole with watertight frame and cover installed.

3. The unit price bid shall include all labor, materials, tools, equipment and services for furnishing and installing 4’-0” dia. precast concrete drop manhole with watertight frame and cover, but not limited to: field surveying, pavement removal; bypass pumping existing flows as required; excavation; storage, handling and use of excavated materials; disposal of rock, excess and unsuitable soils, locating and supporting existing utilities; backfill; compaction; trench support; dewatering; stone bedding; handling and placing of manhole sections; handling and setting of frames and covers; drop pipe and fittings; concrete encasement; installation of liners; waterproofing; connections; pavement replacement; temporary blocking; testing and any other incidental items required for the proper operation of the manholes.

U. Item A-21: 5’-0” Dia. Precast Concrete Drop Manhole with Watertight Frame and Cover, Complete, In-Place
1. Payment for furnishing and installing 5’-0” dia. precast concrete drop manhole with watertight frame and cover shall be made at the unit price bid per each manhole actually installed.

2. Measurement shall be for each 5’-0” diameter precast concrete drop manhole with watertight frame and cover installed.

3. The unit price bid shall include all labor, materials, tools, equipment and services for furnishing and installing 5’-0” dia. precast concrete drop manhole with watertight frame and cover, but not limited to: field surveying, pavement removal; bypass pumping existing flows as required; excavation; storage, handling and use of excavated materials; disposal of rock, excess and unsuitable soils, locating and supporting existing utilities; backfill; compaction; trench support; dewatering; stone bedding; handling and placing of manhole sections; handling and setting of frames and covers; drop pipe and fittings; concrete encasement; installation of liners; waterproofing; connections; pavement replacement; temporary blocking; testing and any other incidental items required for the proper operation of the manholes.

V. Item A-22: Remove and Replace Existing Manhole with 4’-0” Dia. Precast Concrete Manhole and Watertight Frame and Cover, Complete, In-Place

1. Payment for removing and replacing existing manhole with 4’-0” dia. precast concrete manhole and watertight frame and cover shall be made at the unit price bid per each manhole actually installed.

2. Measurement shall be for each removal and replacement of existing manhole with 4’-0” diameter precast concrete manhole and watertight frame and cover installed.

3. The unit price bid shall include all labor, materials, tools, equipment and services for removing and replacing existing manhole with 4’-0” dia. precast concrete manhole and watertight frame and cover including, but not limited to: field surveying, bypass pumping of existing flows as required; pavement removal; excavation; storage, handling and use of excavated materials; disposal of rock, excess and unsuitable soils, locating and supporting existing utilities; backfill; compaction; trench support; dewatering; stone bedding; handling and placing of manhole sections; handling and setting of frames and covers; installation of liners; waterproofing; connections; pavement replacement; temporary blocking; testing and any other incidental items required for the proper operation of the manholes.
W. Item A-23: Remove and Replace Exiting Manhole with 4’-0” Dia. Precast Concrete Drop Manhole and Watertight Frame and Cover, Complete, In-Place

1. Payment for removing and replacing existing manhole with 4’-0” dia. precast concrete drop manhole and watertight frame and cover shall be made at the unit price bid per each manhole actually installed.

2. Measurement shall be for each removal and replacement of existing manhole with 4’-0” diameter precast concrete drop manhole and watertight frame and cover installed.

3. The unit price bid shall include all labor, materials, tools, equipment and services for removing and replacing existing manhole with 4’-0” dia. precast concrete drop manhole and watertight frame and cover including, but not limited to: field surveying, bypass pumping of existing flows, pavement removal; excavation; storage, handling and use of excavated materials; disposal of rock, excess and unsuitable soils, locating and supporting existing utilities; backfill; compaction; trench support; dewatering; stone bedding; handling and placing of manhole sections; handling and setting of frames and covers; installation of liners; waterproofing; connections; pavement replacement; temporary blocking; testing and any other incidental items required for the proper operation of the manholes.

X. Item A-24: Decommission PS 20 Pumping Station, Complete

1. Lump sum cost to decommission existing sanitary sewage pumping station PS 20.

2. No measurement shall be made. Payment shall not be made until the pumping station has been decommissioned in accordance with the specifications and Contract Drawings.

3. The lump sum cost shall include all labor, materials, tools, equipment and services to decommission the existing pumping station including, but not limited to: field surveying; excavation; storage, handling and use of excavated materials; disconnecting electrical service; coordination of work with Owner; draining piping, emptying and cleaning wet well; removal and disposal of electrical conduit at wet well; abandonment of piping; installation of sand or flowable fill; demolition and disposal of existing structures and foundations; finish grading of site; seeding and mulching; and any other incidental items required for the proper decommissioning of the pumping station.

Y. Item A-25: 1” Air Release Valve, Complete, In-place
1. Payment for furnishing and installing air release valves shall be made at the unit price bid per each for the air release valves actually installed.

2. No measurement shall be made. Payment shall not be made until each air release valve and associated appurtenances are complete, tested and accepted.

3. The unit price bid per each shall include all labor, materials, tools, equipment and services for the air release valves including, but not limited to; field surveying, excavation, storage, handling and use of excavated materials, disposal of rock, excess and unsuitable soils, temporary access roads, locating and supporting existing utilities, trench support, dewatering, 4'-0" diameter manhole with vent piping, frame and cover, and all associated piping connections and any other incidental items required for the proper operation of the air release valve.

Z. Item A-26: Class I Rip Rap for Stream Bank Stabilization Measures

1. Payment for furnishing and installing class I rip rap for stream bank stabilization measures shall be made at the unit price bid per cubic yard for the quantity actually installed.

2. Measurement shall be for each cubic yard of rip rap furnished and installed.

3. The unit price bid per cubic yard shall include all labor, materials, tools, equipment and services for furnishing and installing rip rap and stream bank stabilization measures including, but not limited to: field surveying, unclassified excavation, storage, handling and reuse of excavated materials, locating and supporting existing utilities; dewatering, disposal of unsuitable and excess materials, geotextile material, inspection and maintenance, restoration and fine grading, dewatering and any other incidental items required for the proper performance of the rip rap for the stream bank stabilization measures.

AA. Item A-27: Coir Fiber Matting for Stream Bank Stabilization Measures

1. Payment for furnishing and placing coir fiber matting will be made at the unit price per square yard.

2. Measurements will be made to confirm square yards of matting actually installed.

3. The unit price bid per square yard for coir fiber matting shall include all supervision, labor, materials, equipment and incidental items necessary to
install and maintain coir fiber matting; fine grading needed to establish finished slope for matting installation; unclassified excavation; disposal of excess and unsuitable materials, seeding, final restoration, fasteners, anchors, and other incidental items required for the proper operation of the coir fiber matting.

BB. Item A-28: Live Steaks for Stream Bank Stabilization Measures

1. Payment for furnishing and installing live stakes for stream bank stabilization shall be made at the unit price bid per each for each live stake actually installed.

2. Measurements will be for each number of live stakes actually installed.

3. Live Stakes will be measured and paid for at the Contract unit price per each, which price bid shall include furnishing (by harvesting or purchasing), storing and installing the live stakes. The unit price for live stakes shall include all supervision, labor, materials, equipment and incidental items necessary to install the live staking; fine grading needed to establish finished slope for installation; unclassified excavation; disposal of excess and unsuitable materials, final restoration, maintenance, replacement as needed, warranties, and other incidental items required for the proper operation and establishment of the live stakes.

CC. Item A-29: Stream Restoration, Complete

1. Lump sum cost to restore existing stream at location shown on the contract drawings.

2. No measurement shall be made. Payment shall not be made until the stream restoration has been completed in accordance with the specifications, Contract Drawings, and associated permit requirements.

3. The lump sum cost shall include all labor, materials, tools, equipment and services to perform the stream restoration including, but are not limited to: field surveying, excavation; storage, handling and use of excavated materials; rough and fine grading; coordination of work with Owner and Engineer; maintaining flows within existing stream; removal and disposal of existing culverts; disposal of rock and unsuitable soils, locating and supporting existing utilities, installation of rip rap and geotextile as required; preparation of subgrades; seeding and mulching as required; stabilization of disturbed areas; protection of existing utilities; coordination and inspection by Corps of Engineers, Owner, and Engineer as needed, and any other incidental items required for the proper construction and function of the stream restoration.
1.05 CONTINGENT ITEMS

A. Item B-1: Unclassified Excavation, Complete

1. This item of work consists of additional unclassified excavation when and where directed by the Engineer. Work does not include any excavation associated with installation of pipe or structures shown on the Contract Drawings.

2. Measurement shall be based on the dimensions of the area to be excavated.

3. Payment for work completed under this item shall be made at the unit price bid per cubic yard. The unit price per cubic yard shall include and cover furnishing all labor, materials, tools, equipment and services necessary to excavate, whether done by hand or equipment, and shall include temporary sheeting, locating and supporting existing utilities, bracing, dewatering, disposal of unsuitable and excess material and any other incidental items required for proper execution of the work.

B. Item B-2: Porous Backfill, Complete, In-Place

1. Payment for furnishing and placing select borrow material (obtained offsite) will be made at the unit price bid per cubic yard. Measurement shall be for VDOT No. 57 stone, compacted, in-place as directed in writing by the Engineer.

2. Payment will not be made for this item under Over-Excavation of Unsuitable Subgrade with Porous Refill nor for select borrow material placed beyond the limits directed by the Engineer.

3. The unit price bid per cu. yd. shall include all labor, materials, tools, equipment and services for furnishing and placing select borrow material including, but not be limited to: field surveying, excavation, disposal of unsuitable materials, transportation, locating and supporting existing utilities, placing of select material, compaction, dewatering, and any other incidental items required for the proper operation of the porous backfill.

C. Item B-3: Borrow Material (AASHTO M145), Complete, In-Place

1. Payment for furnishing and placing borrow material (obtained offsite) will be made at the unit price bid per cubic yard. Measurement shall be for AASHTO M145 material, compacted, in-place as directed in writing by the Engineer.
2. Payment will not be made for this item under Over-Excavation of Unsuitable Subgrade with Porous Refill nor for select borrow material placed beyond the limits directed by the Engineer.

3. The unit price bid per cu. yd. shall include all labor, materials, tools, equipment and services for furnishing and placing borrow material (AASHTOM145) including, but not be limited to; field surveying, excavation, disposal of unsuitable materials, transportation, locating and supporting existing utilities, placing of borrow material, compaction, dewatering, and any other incidental items required for the proper operation of the backfill.

D. Item B-4: Additional Test Pits, as Directed by the Engineer

1. This item of work consists of excavating test pits when directed by the Engineer. Work does not include test pits associated with locating any existing utilities shown on the Contract Drawings.

2. Payment for work completed under this item shall be made at the unit price bid per each. The unit price per each shall include and cover furnishing all labor, materials, tools, equipment and services necessary to excavate the test pit whether done by hand or equipment and shall include temporary sheeting, support of existing utilities, bracing, dewatering, backfill, compaction, disposal of excess and unsuitable materials and surface restoration as necessary.

E. Item B-5: Over-Excavation of Unsuitable Subgrade w/ Porous Refill, Complete

1. Payment for excavation below the trench subgrade due to unsuitable soil conditions and furnishing and backfilling with VDOT No. 57 stone shall be made at the unit price bid per cu. yd. Measurement shall be for compacted material, in-place as directed in writing by the Engineer.

2. The unit price bid per cu. yd. of material shall include all labor, materials, tools, equipment and services for excavating unsuitable materials and furnishing, installing and compacting select fill including, but not limited to; field surveying, excavation, disposal of rock and unsuitable materials, transportation, locating and supporting existing utilities, placing of select material, compaction, dewatering, and any other incidental items required for the proper operation of the drop inlet.

F. Item B-6: Testing and Laboratory and Testing Services

1. Bidder shall include in the Total Bid Amount an allowance of $20,000.00 for payment of soil and concrete materials testing firm services. The
Owner and Engineer shall select a soils and concrete testing firm to perform Owner provided services as defined in the Contract. Services rendered by the testing firm shall be directed by the Owner and Engineer, and invoices shall be submitted directly to the Engineer and Owner. As a matter of convenience to the Owner, the Contractor shall pay invoices from the selected soil and concrete materials testing firm from this allowance when so directed by the Engineer. All other material testing requirements of the Contract shall be included in the Contractor’s Total Bid Amount and will not be reimbursed to the Contractor through this allowance. Any pass through costs associated with this allowance will not include any Contractor markup. If Owner and Engineer deem an expense reimbursable under this allowance, an Allowance Directive shall be issued to the Contractor. Unused portions of this allowance shall be credited to the Owner in the closeout change order that will be issued prior to final payment.

G. Item B-7: EC-2 Geotextile, Complete, In-Place

1. Payment for furnishing and placing additional EC-2 geotextile will be made at the unit price bid per square yard. Measurement shall be for material, in-place as directed in writing by the Engineer.

2. The unit price per square yard shall include and cover furnishing all labor, materials, tools, equipment and services necessary to install the EC-2 geotextile including backfill, compaction, disposal of excess material, surface restoration as necessary, subgrade preparation and all other incidental items.

H. Item B-8: Remove and Replace Existing 6 ft. Wooden Stockade Fence, Complete, In-Place

1. Payment for removing and replacing existing 6 ft. wooden stockade fence will be made at the unit price bid per linear foot. Measurement of lengths shall be horizontally, along the center of the existing fence to be removed and replaced, complete, in-place as directed in writing by the Engineer.

2. The unit price per linear feet shall include and cover furnishing all labor, materials, tools, equipment and services for removal and replacement of existing fence, including installation of temporary fencing and support as required, field surveying, coordination with property owners, locating and supporting existing utilities, backfill, compaction, disposal of excess and unsuitable material, surface restoration as necessary, subgrade preparation and all other incidental items.

I. Item B-9: Remove and Replace Existing 4 ft. Chain Link Fence, Complete, In-Place
1. Payment for removing and replacing existing 4 ft. chain link fence will be made at the unit price bid per linear foot. Measurement of lengths shall be horizontally, along the center of the existing fence to be removed and replaced, complete, in-place as directed in writing by the Engineer.

2. The unit price per linear feet shall include and cover furnishing all labor, materials, tools, equipment and services for removal and replacement of existing fence, including installation of temporary fencing and support as required, field surveying, coordination with property owners, locating and supporting existing utilities, backfill, compaction, disposal of excess and unsuitable material, surface restoration as necessary, subgrade preparation and all other incidental items.

J. Item B-10: Remove and Replace Existing 6 ft. Chain Link Fence, Complete, In-Place

1. Payment for removing and replacing existing 6 ft. chain link fence will be made at the unit price bid per linear foot. Measurement of lengths shall be horizontally, along the center of the existing fence to be removed and replaced, complete, in-place as directed in writing by the Engineer.

2. The unit price per linear feet shall include and cover furnishing all labor, materials, tools, equipment and services for removal and replacement of existing fence, including installation of temporary fencing and support as required, field surveying, coordination with property owners, locating and supporting existing utilities, backfill, compaction, disposal of excess and unsuitable material, surface restoration as necessary, subgrade preparation and all other incidental items.

K. Item B-11: Remove and Replace Existing Wooden Split Rail Fence, Complete, In-Place

1. Payment for removing and replacing existing wooden split rail fence will be made at the unit price bid per linear foot. Measurement of lengths shall be horizontally, along the center of the existing fence to be removed and replaced, complete, in-place as directed in writing by the Engineer.

2. The unit price per linear feet shall include and cover furnishing all labor, materials, tools, equipment and services for removal and replacement of existing fence, including installation of temporary fencing and support as required, field surveying, coordination with property owners, locating and supporting existing utilities, backfill, compaction, disposal of excess and unsuitable material, surface restoration as necessary, subgrade preparation and all other incidental items.
1.06 PAYMENT FOR MATERIALS NOT INCORPORATED INTO THE WORK

A. Storage of Materials

1. Payment for equipment and materials stored on the site, or elsewhere as specified in the GENERAL CONDITIONS, and not actually incorporated in the work will not be made by the County.

B. Authorization for Payment

1. Payment will be authorized after the delivery to the construction site or other approved location and after being certified by the Engineer as being stored in conformation with the manufacturer’s recommendations and satisfactory evidence is provided that the items are as specified.

2. Should materials or equipment become damaged or be stored improperly or contrary to the manufacturer’s recommendations, being therefore subject to later damage, then the Engineer will reduce the next following monthly payment by an amount sufficient to repair or replace such units.

3. To initiate a request for partial payment the Contractor shall submit his request in writing to the Engineer with all necessary evidence.

4. Items of material or equipment to which partial payment applies includes and is limited to the following:

   a. Silt Fence
   b. Super Silt Fence
   c. Dewatering Structures
   d. 8” Dia. Gravity Sewer
   e. 12” Dia. Gravity Sewer
   f. 24” Dia. Gravity Sewer
   g. 12” Dia. Water Main
   h. Precast Sanitary Manholes, all diameters
   i. Temporary and Permanent Seeding

PART II - PRODUCTS (Not Used)

PART III - EXECUTION (Not Used)

END OF SECTION
SECTION 01152
APPLICATIONS FOR PAYMENT

PART 1 - GENERAL

1.01 THE REQUIREMENT

A. Submit Applications for Payment in accordance with the requirements established by the Contract Documents.

1.02 FORMAT AND DATA REQUIRED

A. Applications shall include the following:

1. Application and Certification for Progress Payment form.

2. CPM Schedule Earned Value Report. The CPM schedule submitted in accordance with Section 01310 shall be the basis for payment.

3. Invoices for stored materials.

4. Contractor's Monthly Status report in accordance with section 01310.

1.03 PREPARATION OF APPLICATION FOR EACH PROGRESS PAYMENT

A. Application Form

1. Fill in required information on the "Application and Certification for Progress Payment" form.

2. Execute certification with signature of a responsible officer of CONTRACTOR. An original signature should appear on each copy submitted.

3. Attach to the Application the CPM Schedule Updated Earned Value Report. The agreed upon Earned Value Report will be the basis for all progress payments.

4. Attach to the Application, for payment of materials stored on or off site, original paid invoices.

5. Other Withholding from Progress Payment

a. If it is determined that additional monies should be withheld from the amount otherwise due CONTRACTOR, a "Other Withholding from Progress Payment" form will be completed with an explanation of the
amount and reasons for such Other Withholding, and will be attached to each copy of the Application. Some items which, might be included in the Other Withholding amount are, but not limited to: engineering fees for review of substitutions; excessive shop drawing review; overtime required by CONTRACTOR's work in excess of eight hours per day; costs incurred due to CONTRACTOR caused damage to private or public property; etc.

1.04 SUBSTANTIATING DATA FOR PROGRESS PAYMENTS

A. Provide any substantiating data, as requested by the ENGINEER.

B. Since the operation and maintenance information to be supplied will be reviewed initially and then resubmitted, payment for individual items of equipment shall be limited to 75 percent of the invoiced equipment value until the preliminary draft operation and maintenance data is submitted and receives a "Furnish as Corrected" annotation by ENGINEER.

C. As a prerequisite for monthly progress payments, exhibit the updated record drawings for review.

1.05 SUBMITTAL PROCEDURES

A. Submit, to ENGINEER, Applications for Payment at the times stipulated in the Agreement.

B. Submit six copies of each Application.

C. When Application is determined to be properly completed and correct, three copies of the certificate for payment will be transmitted to OWNER, one to ENGINEER, and one copy will be returned to CONTRACTOR.

PART 2 – PRODUCTS  (NOT USED)

PART 3 – EXECUTION  (NOT USED)

- END OF SECTION -
SECTION 01153

CHANGE ORDER AND FIELD ORDER PROCEDURES

PART 1 - GENERAL

1.01 REQUIREMENTS

A. Promptly implement change order procedures as follows:
   1. Provide full written data required to evaluate changes.
   2. Maintain detailed records of Work done on a time-and-material/force account basis.
   3. Provide full documentation on request.

B. Designate in writing the member of CONTRACTOR's organization:
   1. Who is authorized to accept changes in the Work.
   2. Who is responsible for informing others in the CONTRACTOR's employ of the authorization of changes in the Work.

C. OWNER will designate in writing the person who is authorized to execute Change Orders and Work Directive Changes.

D. Forms for Change Orders, Work Directive Changes and Field Orders are included in Specification Sections 00710 through 00712.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 00500 - Agreement

B. General and Supplementary Conditions

C. Section 01152 - Applications for Payment

D. Section 01310 - CPM Construction Schedule

1.03 PRELIMINARY PROCEDURES

A. ENGINEER may initiate changes by submitting a Request for Proposal (RFP) to the CONTRACTOR in accordance with paragraph 10.01.B of the General Conditions as amended by the Supplementary Conditions. Request will include:
1. A detailed description of the change, products, and location of the change in the Project;

2. Supplementary or revised Drawings and Specifications;

3. The projected time span for making the change, and a specific statement as to whether overtime work is, or is not, authorized;

4. Such request is for information only, and is not an instruction to execute the changes, or to stop work in progress.

B. CONTRACTOR may initiate a request to make a change by submitting a written notice (in a form acceptable to the ENGINEER) containing:

1. Description of the proposed changes;

2. Statement of the reason for making the changes;

3. Statement of the effect on the Contract Price and the Contract Time;

4. Statement of the effect on the work of separate Contractors;


1.04 WORK CHANGE DIRECTIVE

A. In lieu of a Request for Proposal (RFP), ENGINEER may issue a Work Change Directive (WCD) for the CONTRACTOR to proceed with a change for subsequent inclusion in a Change Order.

B. A WCD will describe changes in the Work, both additions and deletions, with attachments of revised Contract Documents to define details of the change, and will designate the method of determining any change in the Contract Price and any change in Contract Time.

C. OWNER will sign and date the WCD as authorization for the CONTRACTOR to proceed with the changes.

D. CONTRACTOR may sign and date the WCD to indicate agreement with the terms therein.

1.05 DOCUMENTATION OF PROPOSALS AND CLAIMS
A. CONTRACTOR shall support each quotation for a lump-sum proposal, and for each unit price that has not previously been established, with sufficient substantiating data to allow evaluation of the quotation, in accordance with Articles 10, 11 and 12 of the General Conditions.

B. On request, CONTRACTOR shall provide additional data to support time and cost computations including, but not limited to, the following:

1. Labor required
2. Equipment required
3. Products required
   a. Recommended source of purchase and unit cost
   b. Quantities required
4. Taxes, insurance, and bonds
5. Credit for Work deleted from Contract, similarly documented
6. Overhead and profit
7. Justification for any change in Contract Time

C. Support each claim for additional costs, and for Work done on a time-and-material/force account basis, with documentation in accordance with the General Conditions, plus additional information as follows:

1. Name of the OWNER's authorized agent who ordered the Work, and date of the order.
2. Dates and times Work was performed, and by whom.
3. Time record, summary of hours worked, and hourly rates paid.
4. Receipts and invoices for:
   a. Equipment used, listing dates, and times of use
   b. Products used, listing of quantities
   c. Subcontracts

1.06 PREPARATION OF CHANGE ORDERS AND FIELD ORDERS

A. ENGINEER will prepare each Change Order and Field Order with technical
requirements provided by the ENGINEER.

B. Forms: See Specification Sections 00710 through 00712 for forms.

C. Change Order will describe changes in the Work, both additions and deletions, with attachments of revised Contract Documents to define details of the change.

D. Change Order will provide an accounting of the adjustment in the Contract Price and in the Contract Time.

E. Field Order will describe interpretations or clarifications of Contract Documents, order minor changes in the Work, and/or document trade-off agreements.

F. Field Order Work will be accomplished without change in the Contract Price, Contract Time, and/or claims for other costs.

G. If in agreement, the CONTRACTOR shall sign and return Field Orders for execution by the next working day at which time they will become binding on the CONTRACTOR.

1.07 CORRELATION WITH CONTRACTOR’S SUBMITTALS

A. Revise Schedule of Values and Application for Payment forms to record each change as a separate item of Work and to record the adjusted Contract Price.

B. Revise the Construction Schedule monthly to reflect each change in Contract Time. Revise sub-schedules to show changes for other items of Work affected by the changes.

C. Upon completion of Work under a Change Order, enter pertinent changes in Record Documents.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

- END OF SECTION -
SECTION 01200

PROJECT MEETINGS

PART 1 - GENERAL

1.01 SCOPE OF WORK

A. The Engineer will schedule and administer a preconstruction meeting, periodic progress meetings, and specially called meetings throughout the progress of the work.

1. Prepare agenda for meetings
2. Make physical arrangements for meetings
3. Preside at meetings

B. Representatives of the Contractor, subcontractors and suppliers attending meetings shall be qualified and authorized to act on behalf of the entity each represents.

C. The Contractor shall attend meetings to ascertain that work is expedited consistent with Contract Documents and construction schedules.

1.02 PRECONSTRUCTION MEETING

A. A preconstruction meeting will be scheduled before the Contractor starts Work at the site.

B. Location: A site designated by the Engineer.

C. Attendance:

1. Owner's representative
2. Engineer and his professional consultants
3. Contractor's project manager and superintendent
4. Major subcontractors
5. Utilities representative
6. Others as appropriate
D. Suggested Agenda:

1. Distribution and discussion of:
   a. List of major subcontractors and suppliers
   b. Projected construction schedules
2. Critical work sequencing.
3. Major equipment deliveries and priorities.
4. Project coordination:
   a. Designation and responsible personnel
5. Procedures and processing of:
   a. Field decisions
   b. Proposal requests
   c. Submittals
   d. Change Orders
   e. Applications for payment
7. Procedures for maintaining Record Documents.
8. Use of premises:
   a. Office, work and storage areas.
   b. Owner’s requirements.
10. Temporary utilities.
11. Housekeeping procedures.
12. Check of required Bond and Insurance certifications.
13. Liquidated damages.
14. Check of required Permits.
15. Laboratory testing of material requirements.
16. Inventory of material stored on site.

17. Wage determination compliance and records, work hours.

18. MBE/WBE fair share objective, affirmative action, nondiscrimination policies.

19. Communication lines and contact persons, including address and telephone number.

20. Manufacturers' operation and maintenance manuals, and operation and maintenance training.

21. Regulatory agency inspections.

22. Progress agency inspections.

23. Job site safety.

1.03 PROGRESS MEETINGS

A. Regular periodic meetings will be held every 30 days or less. The first meeting will be scheduled 30 days after the Preconstruction Meeting or 30 days or less after the date of Notice to Proceed.

B. Additional meetings will be scheduled as required by progress of the work.

C. Location of the meetings: Contractor or Engineer Field Office.

D. Attendance:

1. Engineer and his professional consultants as needed.

2. Contractor and his Subcontractors (as appropriate to the agenda).

3. Owner's representative.

4. Others as appropriate.

E. Suggested Agenda:

1. Review and approval of minutes of previous meeting.

2. Review of work progress since previous meeting.
3. Field observations, problems and conflicts.
4. Problems which impede Construction Schedule.
5. Review of off-site fabrication, delivery schedules.
6. Corrective measures and procedures to regain projected schedule.
7. Revisions to Construction Schedule.
8. Progress schedule during succeeding work period.
9. Coordination of schedules.
10. Review submittal schedules; expedite as required.
12. Pending changes and substitutions.
13. Review proposed changes for:
   a. Effect on Construction Schedule and on completion date.
   b. Effect on other contracts of the Project.

F. The Contractor is to attend progress meetings and is to study previous meeting minutes and current agenda items, in order to be prepared to discuss pertinent topics such as deliveries of materials and equipment, progress of the work, etc.

G. The Contractor is to provide a current shop drawing submittal log and current progress schedule at each progress meeting in accordance with Section 01300.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION
SECTION 01300

SUBMITTALS

PART 1 - GENERAL

1.01 GENERAL

A. The Contractor shall submit to the Engineer for review and approval such shop drawings, test reports and product data on materials and equipment (hereinafter in this section called data), and material samples (hereinafter in this section called samples) as are required for the proper control of work, including but not limited to those shop drawings product data and samples for materials and equipment specified elsewhere in the Specifications and in the Contract Drawings.

B. Within thirty (30) days after the effective date of the Contract, the Contractor shall submit to the Engineer a complete list of preliminary data on items for which Shop Drawings are to be submitted. Included in this list shall be the names of all proposed manufacturers furnishing specified items. Review of this list by the Engineer shall in no way, expressed or implied, relieve the Contractor from submitting complete Shop Drawings and providing materials, equipment, etc., fully in accordance with the Specifications. The procedure is required in order to expedite final review of Shop Drawings.

C. The Contractor is to maintain an accurate updated submittal log and will bring this log to each scheduled progress meeting with the Owner and the Engineer. This log should include the following items:

1. Submittal-Description and Number assigned.
2. Date to Engineer.
3. Date returned to Contractor (from Engineer).
4. Status of Submittal (Approved, Approved as Noted, Revise and Return, Rejected).
5. Date of Resubmittal and Return (as applicable).
6. Date material release (for fabrication).
7. Projected date of fabrication.
8. Projected date of delivery to site.
10. Specification Section.
11. Drawings Sheet Number.

1.02 TYPES OF SUBMITTALS

A. Shop drawings for manufactured or fabricated items, schedules, diagrams and like material prepared specially for this project.
B. Product Data which include pre-printed material, manufacturer's descriptive literature, illustrations, catalog data, performance charts and the like intended to identify a part of the work but not necessarily prepared exclusively for this Contract.

C. Samples which include physical examples of products, materials, assemblies or workmanship which are identical to a portion of the work and which establish standards for materials, workmanship, or appearance of the finished work.

D. Administrative data to include information required to support the administrative requirements of the contract as called for in the specifications.

1.03 PROCEDURE FOR SUBMITTALS

A. Except where specifically stated otherwise all submittals shall be made to the Engineer for his approval. Submittals of all but administrative data shall be made in at least six (6) copies. Two (2) copies of the submittal will be retained by the Engineer - one (1) for the office and one (1) for the field. One (1) copy will be provided to the Owner. The remaining copies will be returned to the Contractor. Submittals shall be complete for each component of work or system and shall include all inter-related portions of a system. At the completion of the project, the Contractor shall furnish the Engineer one revised record copy as described in Paragraph 1.06.

B. Administrative data shall be submitted in triplicate (3 copies).

1.04 CONTRACTOR'S RESPONSIBILITY

A. It is the duty of the Contractor to check all drawings, data and samples prepared by or for him before submitting them to the Engineer for review. Each and every copy of the Drawings and data shall bear a Contractor's stamp showing that they have been checked. Shop drawings submitted to the Engineer without the Contractor's stamp will be returned to the Contractor for conformance with this requirement. Shop drawings shall indicate any deviations in the submittal from requirements of the Contract Documents.

B. Engineer's Contract Drawings shall not be reproduced for the purpose of making shop drawings.

C. Determine and verify:

1. Field measurements.
2. Field construction criteria.
3. Catalog numbers and similar data.
4. Conformance with Specifications.
D. The Contractor shall furnish the Engineer a schedule of Shop Drawings submittals fixing the respective dates for the submission of shop drawings, the beginning of manufacture, testing and installation of materials, supplies and equipment. This schedule shall indicate those submittals that are critical to the progress schedule.

E. The Contractor shall ensure that no work is begun on any item of work requiring an approved submittal until such approval is obtained.

F. The Contractor shall not begin any work covered by a drawing, data, or a sample returned marked "REVISE AND RETURN" OR "REJECTED" until a revision or correction thereof has been reviewed and returned to him, by the Engineer, with approval.

G. One approved copy of all submittals shall be held by the Contractor at the construction site.

H. Each submittal shall be assigned a sequential number by the Contractor, for purposes of easy identification, and shall retain its assigned number with appropriate subscript, on required resubmissions. The assigned number shall consist of the Contract Number, followed by the specification section number where the item is specified, followed by a sequential number indicating the number of submittals in that Section (e.g., 03300-11 is the 11th separate submittal for items specified in Section 03300). Resubmittals shall be identified with the same number as the original submittal, followed by the subscript R1, R2, etc. All products and materials submitted shall be clearly identified with the appropriate equipment name and number as it appears in the Contract Document.

I. The Contractor shall submit to the Engineer all drawings and schedules sufficiently in advance of construction requirements to provide no less than 30 calendar days for reviewing and appropriate action from the time the Engineer receives them.

J. All submittals shall be accompanied with a transmittal letter prepared in duplicate containing the following information:

1. Date.
2. Project Title and Number.
3. Contractor's name and address.
4. The Number of each Shop Drawing, Project Data, and Sample submitted.
6. Submittal Log Number conforming to Specification Section Numbers.

K. The Contractor shall submit six (6) copies of shop drawing submittals to the Engineer, three of which will be returned to the Contractor.
L. The Contractor shall be responsible for and bear all costs of damages which may result from the ordering of any material or from proceeding with any part of work prior to the completion of the review by Engineer of the necessary Shop Drawings.

M. The Contractor shall be fully responsible for observing the need for and making any changes in the arrangement of piping, connections, wiring, manner of installation, etc., which may be required by the materials/equipment he proposed to supply both as pertains to his work and any work affected under other parts, heading, or divisions of drawings and specifications at no cost to the Owner.

1.05 ENGINEER'S REVIEW OF SHOP DRAWINGS

A. The Engineer's review of drawings, data and samples submitted by the Contractor will be only for conformance with the design concept of the Project and for general compliance with the information given in the Contract Documents. The Engineer's review and approval will not constitute an approval of dimensions, quantities, and details of the material, equipment, device, or item shown.

B. The review of drawings and schedules will be general, and shall not be construed:
   1. as permitting any departure from the Contract requirements;
   2. as relieving the Contractor of responsibility for any errors, including details, dimensions, and materials;
   3. as approving departures from details furnished by the Engineer, except as otherwise provided herein.
   4. as approving Contractor's means, methods, techniques, sequences or procedures of construction or to safety precautions or programs incident thereto.

C. If the drawings or schedules as submitted describe variations and show departure from the Contract requirements which the Engineer finds to be in the interest of the Owner and to be so minor as not to involve a change in Contract Price or time for performance, the Engineer may return the reviewed drawings without noting and exception.

D. When reviewed by the Engineer, each of the Shop Drawings will be identified as having received such review being so stamped and dated. Shop Drawings stamped "REVISE AND RESUBMIT" and with required corrections shown will be returned to the Contractor for correction and resubmittal.

E. Resubmittals will be handled in the same manner as first submittals. On resubmittals the Contractor shall direct specific attention, in writing or on resubmitted Shop
Drawings, to revisions other than the corrections requested by the Engineer on previous submissions. The Contractor shall make any corrections required by the Engineer.

F. If the Contractor considers any correction indicated on the drawings to constitute a change to the Contract Drawings or Specifications, the Contractor shall give written notice thereof to the Engineer.

G. Shop drawings and submittal data shall be reviewed by the ENGINEER for each original submittal and first resubmittal; thereafter review time for subsequent resubmittals will be charged to the CONTRACTOR at the rate of $75 per hour.

H. When the Shop Drawings have been completed to the satisfaction of the Engineer, the Contractor shall carry out the construction in accordance therewith and shall make no further changes therein except upon written instructions from the Engineer.

I. No partial submittals will be reviewed. Incomplete submittals will be returned to the Contractor for resubmittal. Unless otherwise specifically permitted by the Engineer, make all submittals in groups containing all associated items for:

1. Gravity Sewer
2. Manholes
3. Water Main
4. Trenchless Road Crossing

1.06 SHOP DRAWINGS

A. When used in the Contract Documents, the term "Shop Drawings" shall be all drawings, diagrams, illustrations, schedules and other data which are specifically prepared by or for Contractor to illustrate some portion of the Work and all illustrations, brochures, standard schedules, performance charts, instructions, diagrams, and other information prepared by a Supplier and submitted by Contractor to illustrate material or equipment for some portion of the Work.

B. Manufacturer's catalog sheets, brochures, diagrams, illustrations and other standard descriptive data shall be CLEARLY MARKED TO IDENTIFY THOSE MATERIALS, PRODUCTS OR MODELS THAT ARE PERTINENT TO THE WORK. Delete information which is not applicable to the Work by striking through or cross-hatching.

C. Drawings and schedules shall be checked and coordinated with the work of all trades involved, before they are submitted for review by the Engineer and shall bear the Contractor's stamp of approval as evidence of such checking and coordination. Drawings or schedules submitted without this stamp of approval shall be returned to the Contractor for resubmission.
D. Each Shop Drawing shall have a blank area 3-1/2 inches by 3-1/2 inches, located adjacent to the title block. The title block shall display the following:

1. Project Title and Number
2. Name of project building or structure
3. Number and title of the shop drawing
4. Date of shop drawing or revision
5. Name of contractor and subcontractor submitting drawing
6. Supplier/manufacturer.
7. Separate detailer when pertinent
8. Specification title and number
9. Specification section
10. Application Contract Drawing Number

E. If drawings show variations from Contract requirements because of standard shop practice or for other reasons, the CONTRACTOR SHALL DESCRIBE SUCH VARIATIONS IN HIS LETTER OF TRANSMITTAL. The transmittal letter shall delineate compliance and exceptions taken to Specifications and Contract Drawings. If acceptable, proper adjustment in the Contract shall be implemented where appropriate. If the Contractor fails to describe such variations, he shall not be relieved of the responsibility for executing the work in accordance with the Contract, even though such drawings have been reviewed.

F. Data on materials and equipment include, without limitation, materials and equipment lists, catalog data sheets, cuts, performance curves, diagrams, materials of construction and similar descriptive material. Materials and equipment lists shall give, for each item thereon, the name and location of the supplier or manufacturer, trade name, catalog reference, size, finish and all other pertinent data.

G. For all mechanical and electrical equipment furnished, the Contractor shall provide a list including the equipment name, and address and telephone number of the manufacturer's representative and service company so that service and/or spare parts can be readily obtained.

H. All manufacturers or equipment suppliers who propose to furnish equipment or products shall submit an installation list to the Engineer along with the required shop drawings. The installation list shall include at least five installations where identical equipment has been installed and has been in operation for a period of at least one (1) year.

I. Only the Engineer will utilize the color "red" in marking Shop Drawing submittals.

J. Before the final payment is made, the Contractor shall furnish to Engineer one (1) set of record shop drawings all clearly revised, complete and up to date showing the
permanent construction as actually made for all reinforcing and structural steel, miscellaneous metals, process and mechanical equipment, yard piping, electrical system and instrumentation system.

1.07 SAMPLES

A. The Contractor shall furnish, for the approval of the Engineer, samples required by the Contract Documents or requested by the Engineer. Samples shall be delivered to the Engineer as specified or directed. The Contractor shall prepay all shipping charges on samples. Materials or equipment for which samples are required shall not be used in work until approved by the Engineer.

B. Samples shall be sufficient size and quantity to clearly illustrate:

1. Functional characteristics of the product, with integrally related parts and attachment devices.
2. Full range of color, texture and pattern.
3. A minimum of three samples of each item shall be submitted.

C. Each sample shall have a label indicating:

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

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

D. The Contractor shall prepare a transmittal letter in triplicate for each shipment of samples containing the information required in subparagraph 1.04J above. He shall enclose a copy of this letter with the shipment and send a copy of this letter to the Engineer. Approval of a sample shall be only for the characteristics or use named in such approval and shall not be constructed to change or modify any Contract requirements.

1.08 MANUFACTURER'S LIST

A. Within 30 days after receipt of a Notice to Proceed, and before ordering any equipment or materials, the Contractor shall submit to the Engineer for approval a complete list of proposed manufacturers and fabricators for all materials and equipment to be used in this Contract. The purpose of this submittal is to allow the Engineer to predetermine the acceptability of proposed suppliers before issuance of purchase orders by the Contractor. Submission and acceptance of the manufacturers'
list shall neither relieve the Contractor from submitting detailed shop drawings and product data for all materials and equipment nor shall it constitute prior acceptance of any specific item of equipment prior to submittal of shop drawings. After submission and acceptance of the manufacturers' list, the Contractor shall not deviate from the named suppliers and manufacturers without written approval from the Engineer.

1.09 OPERATING AND MAINTENANCE INSTRUCTIONAL PERIODS

A. Particular sections of these Specifications require that the Contractor furnish qualified personnel to instruct the Owner's personnel in the proper operation and maintenance of equipment and systems provided in this Contract. Such instructional periods shall be for the duration of time specified and in accordance with the requirements of the individual sections of the Specifications and with the following paragraphs.

1.10 OPERATION AND MAINTENANCE MANUALS FOR EQUIPMENT AND PRODUCTS

A. General:

1. The Contractor shall furnish Operation and Maintenance Manuals for all products and equipment provided under this Contract.

2. Prior to completion of the work, and at least 30 days prior to the 50 percent payment, the Contractor shall furnish for the Engineer's review three (3) Operation and Maintenance Manual draft copies.

3. Prior to completion of the work, and at least 60 days prior the 85 percent payment, the Contractor shall furnish for the Engineer's review three copies of the final Operation and Maintenance Manual. The final manual must be approved by the Engineer before a final inspection of the work will be conducted and prior to the issuance of the Certificate of Substantial Completion.

B. Manual Preparation:

1. Manuals shall include operation and maintenance information on all systems and items of equipment. The data shall consist of: catalogs, brochures, bulletins, charts, schedules, approved Shop Drawings corrected to as-built conditions and assembly drawings and wiring diagrams describing location, operation, maintenance, lubrication, operating weight, lubrication charts and schedules showing manufacturers recommended lubricants for each rotating
or reciprocating unit, and other information necessary for the Owner to establish an effective operating maintenance program. The following data shall also be included:

a. Title page giving name and location of facility, Contract Drawings No(s). where shown and Specification Section where described.
b. Approved Shop Drawings of each piece of equipment.
c. Manufacturer's cuts and dimension drawings of each piece of equipment, and details of all replacement parts.
d. Manufacturer's erection, operation and lubrication instructions for all equipment and apparatus, and complete listing of nameplate data.
e. Complete wiring diagrams of all individual pieces of equipment and systems including one line diagrams, schematic or elementary diagrams, and interconnection and terminal board identification diagrams.
f. Complete piping and interconnecting drawings.
g. Complete parts list with parts assembly drawing (preferably by exploded view), names and addresses of spare parts suppliers, recommended list of spare parts to be kept "in stock" and sample order forms for ordering spare parts. Lead time required for ordering parts shall be estimated.
h. Instructions with easily understood schematics or diagrams for disassembling and assembling the equipment for overhaul or repair.

2. All items listed above that are of a sheet size of 8-1/2 inches by 11 inches or can be folded (no more than twice) to this size shall be bound in 4-inch maximum loose-leaf three-ring d-post type binders with black plastic-coated covers. The contents shall be fully indexed. Binders shall be Vernon Line Royal No. R-6372 or R-372, Sparco Brand Slanted Ring Presentation Binder 68140, Universal D-Ring View Binder 20747, K & M Division VS11-40 or equal. PAGES SHALL BE LINEN REINFORCED ON BINDING EDGE.

3. Shop Drawings 24 inches by 36 inches in size shall be folded to approximately 12 inches by 9 inches with drawing title box exposed along either edge. Shop Drawings descriptive of a single item of equipment shall be grouped together. All Shop Drawings shall be placed in accordion-type folders similar to File Pocket No. 74CG (9-1/2 inches x 14-3/4 inches) as manufactured by the Cooke and Cobb Company, or equal, and fully indexed on the outside of the folders in a neat and uniform manner.

4. All Shop Drawings included in the binders and/or folders shall be those copies previously submitted for review and approval and shall bear the Engineer's stamp of approval and comments as originally noted thereon.

C. Approval:
1. Subsequent to the Engineer's approval and return of the final manual, the Contractor shall submit four complete sets of manuals to the Engineer.

2. Substantial Completion certification will positively not be undertaken until approved Operation and Maintenance Manuals have been submitted. Partial approvals of the final manual will not be made.

3. Delivery of manufacturer's service (O&M) manuals and installation instructions satisfactory to the Engineer are an essential part of the equipment delivery. Incomplete or inadequate manuals will be returned to the Contractor for correction and/or resubmission.

1.11 MANUFACTURER’S REPRESENTATIVE

A. The definition of "manufacturer's representative" shall be as follows: a representative from the manufacturer's plant, familiar with the actual problems of manufacturing, installing and operating the particular equipment or product and with enough years of experience in this field to determine the successful operation of the equipment or product. Sales representatives or agents of the manufacturers will not be acceptable.

B. As related to his obtaining the manufacturer's certificates, the Contractor shall include in this contract price the cost of furnishing competent and experienced manufacturer's representatives who shall represent the manufacturer on equipment and products furnished and installed under this Contract, to assist the Contractor to install, adjust, start up, and test the equipment and products in conformity with the Contract Documents. After the equipment and products have been operated through the trial period for each phase of construction and before being put into permanent service the Engineer, such manufacturer's representatives shall make all adjustments and tests required to provide that such equipment and products are in proper and satisfactory.

1.12 ENGINEER’S RESPONSIBILITY

A. The Engineer will review, with reasonable promptness, all submittals with respect to the Contract Documents and will indicate a qualified “Approval”, an “Approval As Noted”, a “Revise and Return” or “Rejected” notation. The Engineer will return all submittals found incomplete without a review.

1.13 MIX DESIGNS
A. Mix designs shall be submitted for concrete, grout, and bituminous paving. Mix design shall indicate all materials used in the product and their respective relative quantities. In any one mix design all quantities shall be expressed either by weight or volume insofar as it is practical to do so. The Contractor's attention is directed to Section 03300 of these Specifications for proportioning and testing requirements of concrete.

1.14 DESIGN CALCULATIONS

A. Design calculations shall be presented in a neat, legible manner and shall bear the stamp and signature of a Registered Professional Engineer, registered in the State of Virginia.

1.15 RECORD DRAWINGS

A. The Contractor will keep one copy of all Specifications, Drawings, Addenda, Change Orders and Shop Drawings in the field office at the site, in good order and annotated to show all changes made during the construction process. These shall be available to the Engineer and shall be delivered to him upon completion of the project. If the Contractor fails to maintain the record drawings as required herein, final payment, with respect to the Contract as a whole, will be withheld until proper record drawings have been furnished to the Engineer.

PART 2 - PRODUCTS - (Not Used)

PART 3 - EXECUTION - (Not Used)
SECTION 01310

CPM CONSTRUCTION SCHEDULE

PART 1 -- GENERAL

1.01 WORK INCLUDED

A. This section specifies requirements and procedures in preparing and updating construction schedules and reports for planning, coordinating, executing, and monitoring the progress of the work. The construction work shall be scheduled using the Critical Path Method (CPM) of network analysis.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 00700 - General Conditions
B. Section 01010 - Summary of Work
C. Section 01200 - Project Meetings

1.03 FORM OF SCHEDULES

A. Prepare schedules in the form of critical path method (CPM) as described herein.

1. Provide separate CPM networks (sub-networks) of activities for each process or facility.
2. Each sub-network shall be assigned a code and separate activity numbering series.
3. Interrelationships between sub-networks and any individual activities shall be identified.

1.04 SCHEDULING RESPONSIBILITIES

A. The Critical Path Method type construction schedule will be used to monitor job progress and as a means to make monthly payments to CONTRACTOR. CONTRACTOR will be responsible for providing all information concerning the sequencing, logic and durations of all activities as well as providing the initial logic network diagram. Once the schedule is accepted, CONTRACTOR will be responsible for providing monthly update information on logic, percent complete, actual start and finish dates and duration changes. CONTRACTOR will not be required to produce the computerized printout of the schedule updates. This will be performed by ENGINEER using information provided by CONTRACTOR.
Copies of the updated schedule will be distributed at the progress meetings.

B. From CONTRACTOR's initial schedule submittal and from information received at the monthly schedule update meetings, computerized and dated tabular schedule reports, or updated network diagrams, or bar charts will be produced by ENGINEER which will be reviewed by CONTRACTOR for accuracy and integrity. It shall at all times remain CONTRACTOR's responsibility to schedule and direct his forces in a manner that will allow for the completion of the work within the contractual period.

C. It should be clearly understood that the initial schedule and all update information must be provided by CONTRACTOR and that this information is a representation of the best efforts of CONTRACTOR and his subcontractors as to how they envision the work to be accomplished. Similarly, all progress information to be provided by and through CONTRACTOR must be an accurate representation of his or his subcontractor’s or supplier's actual performance. The schedule shall at all times remain an accurate reflection of CONTRACTOR's actual or projected sequencing of work. Once accepted, adherence to the established CPM schedule shall be obligatory upon CONTRACTOR and his subcontractors for the work under this Contract. OWNER may require CONTRACTOR to revise the schedule if, in his judgment, the schedule does not accurately reflect the actual execution of the work, or is in violation of any provision of this CPM scheduling specification, and CONTRACTOR shall revise the schedule as often as is necessary during the course of performance of the work without additional cost to OWNER.

1.06 PROGRESS OF THE WORK

A. The work shall be started on the date indicated in the Notice to Proceed and shall be executed with such progress as may be required to prevent delay to other Contractors or to the general completion of the project. The work shall be executed at such times and in or on such parts of the project, and with such forces, material and equipment, as to assure completion of the work in the time established by the Contract. Additionally, CONTRACTOR shall, at all times, schedule and direct his work so that it provides an orderly progression of the work to completion within the specified Contract Time.

B. CONTRACTOR agrees that whenever it becomes apparent from the current monthly CPM Schedule update that delays to the critical path have resulted and these delays are through no fault of OWNER or OWNER's representatives, and hence, that the Contract completion date will not be met, or when so directed by OWNER he will take some or all of the following actions at no additional cost to OWNER.

1. Increase construction manpower in such quantities and crafts as will substantially eliminate the backlog of work.
2. Increase the number of working hours per shift; shifts per working day, or days per week; the amount of construction equipment; etc., or any combination of the foregoing to substantially eliminate the backlog of work.

3. Schedule activities to achieve maximum practical concurrence of accomplishment of activities, and comply with the revised schedule.

4. CONTRACTOR shall submit for reviewing a written statement of the steps he intends to take, to remove or arrest the delay to the schedule. If CONTRACTOR fails to submit a written statement of the steps he intends to take or fails to take such steps as required by the Contract, OWNER may direct the level of effort in manpower (trades), equipment, and work schedule (overtime) to remove or arrest the delay to the critical path in the accepted schedule, and CONTRACTOR shall promptly provide such level of effort at no additional cost to OWNER. In addition, should schedule delays persist, CONTRACTOR's surety will be asked to attend meetings to update the schedule.

C. Failure of CONTRACTOR to comply with the requirements of this provision shall subject him to, at OWNER's sole discretion, withholding, in partial or in total, payments otherwise due CONTRACTOR for work performed under this Contract. CONTRACTOR agrees that any withholding of moneys is not a penalty for noncompliance, but is an assurance for OWNER that funds will be available to implement these requirements should CONTRACTOR fail to do so, since failure of CONTRACTOR to comply with these requirements shall mean that CONTRACTOR failed to execute the work with such diligence as to ensure its completion within the time for completion.

PART 2 - CPM CONSTRUCTION SCHEDULE

2.01 NETWORK REQUIREMENTS

A. The network diagram shall show the order and interdependence of activities and the sequence in which the work is to be accomplished as planned by CONTRACTOR. The basic concept of the network analysis diagram is to show how the start of a given activity is dependent on the completion of preceding activities and its completion restricts the start of succeeding activities. A time scaled precedence format will be followed. The detailed network diagram will be time scaled showing a continuous flow from left to right.

B. The Schedule Activities shall be developed into three major groups:

1. Procurement Activities (as applicable)
(a) Permits
(b) Easements
(c) Submittal Items
(d) Approval of Submittal Items
(e) Fabrication and Delivery (F&D) of Submittal Items

2. Each of the following procurement activities should be tied logically to the correct construction activity in the overall CPM construction schedule:

(a) Permit activities
(b) Easement activities
(c) F&D activities

3. Construction Activities: Construction activities will be physical work activities that describe how the job will be constructed.

4. Testing, Startup, Training and Close-out: CPM activities for this group shall include all work required to satisfy to appropriate specification sections and meet the requirements of substantial and final completion.

C. CONTRACTOR shall break the work into activities durations of one to twenty (1 to 20) working days each, except for non-construction activities (such as procurement of materials and delivery of equipment) and other activities that may require longer durations. To the extent feasible, activities related to a specific physical area of the project should be grouped on the network for ease of understanding and simplification. The selection and number of activities shall be subject to the review of ENGINEER.

D. Each activity on the network shall have indicated for it the following:

1. A single duration, no longer than 20 days (i.e., the single best estimate of the expected elapsed time considering the scope of work involved in the activity) expressed in working days. Normal holidays and weather delays shall be included. One critical path shall be shown for the schedule.

2. An activity identification number will be assigned to each activity. The identification number will be in a format acceptable to ENGINEER.

3. A brief description of the activity will be included. If this description is not definitive, a separate listing of each activity and a descriptive narrative may be required.

4. Each activity shall be cost loaded to indicate the total estimated budget of the activity. No activity budget shall exceed $75,000 except for F&D activities. Material and/or equipment costs to be paid as stored material
shall be assigned to F&D activities.

5. Each activity (except for procurement activities) shall be man-hour loaded with the estimated man-hours to be expended on each activity.

E. The CPM schedule shall include a weather calendar that contains non-working days in addition to weekend and holidays to account for anticipated inclement weather days. The number of anticipated inclement weather days per month shall be equal to those specified in Figure 2 of this Specification Section. The weather calendar shall be applied to all activities, which may be affected by inclement weather.

F. Failure to include in the CPM schedule any element of Work required under the performance of this Contract shall not excuse CONTRACTOR from completing all Work required within the applicable completion time, notwithstanding OWNER's network review.

G. A CPM schedule which shows a completion of any portion of the Work prior to the contractual completion date may be accepted but in no event shall be acceptable as a basis for a claim for delay against OWNER by CONTRACTOR. The period of time between the CONTRACTOR’s baseline accepted CPM schedule’s projected completion dates and the contractual stipulated completion dates, if any, will be treated as Project Float. The OWNER’s right to utilize Project Float is as provided in paragraph 4.03.

2.02 SCHEDULE OF VALUES

A. Each activity on the construction schedule shall be allocated a dollar value in accordance with 2.01.D.4, above. Each activity's assigned cost shall consist of labor, equipment, and materials costs, and a pro rata contribution of overhead and profit. The sum of activities costs shall be equal to the total Contract Price. In submitting cost data CONTRACTOR certifies that the costs are not unbalanced and that the value assigned to each activity represents CONTRACTOR's estimate of the actual costs of performing that activity.

B. The accepted schedule of values shall represent a fair, reasonable and equitable dollar cost allocation for each activity on CONTRACTOR's construction schedule.

C. If it is determined that the cost data does not meet the requirements for a balanced bid breakdown in the opinion of ENGINEER, CONTRACTOR will present documentation substantiating the cost allocation. Cost allocations shall be considered unbalanced if an activity on the construction schedule has been assigned a disproportionate allocation of direct costs, overhead and profit.

PART 3 - SCHEDULE SUBMITTALS
3.01 CPM SCHEDULE IMPLEMENTATION

A. Within 10 calendar days after the Notice to Proceed, CONTRACTOR shall submit six (6) prints of his proposed CPM network diagram and tabular reports for the first ninety (90) calendar days of the work. This initial logic diagram shall be drawn as described herein and submitted on sheets 24 inches by 36 inches and shall include both procurement and construction activities. The schedule will be the subject of the schedule review meeting with CONTRACTOR, OWNER and OWNER's representatives within two (2) weeks of its submission. CONTRACTOR will revise and resubmit the ninety (90) day schedule until it is acceptable.

B. Within thirty (30) calendar days after Notice to Proceed, CONTRACTOR shall submit six (6) prints of his proposed CPM network diagram and tabular reports for the entire Contract duration and shall include both procurement and construction activities. These tabular reports shall be sorted by total float and activity number. They shall also contain a predecessor/successor resource loading report, and project calendar. This logic diagram shall be drawn as described herein and will be the subject of a schedule review meeting with CONTRACTOR, OWNER, and OWNER's representatives within two (2) weeks of its submission.

C. In lieu of the submitting network diagrams and reports, CONTRACTOR may submit Primavera schedules on floppy disks.

D. If a review of the submitted CPM Schedule indicates a work plan which will not complete the work within the time requirements stated in the Contract, it shall be the responsibility of CONTRACTOR to revise the CPM Schedule as required and resubmit it until it is acceptable. Failure by CONTRACTOR to submit an acceptable schedule may, at OWNER's sole discretion, be cause for the withholding of any partial payment(s) otherwise due under the Contract.

E. Acceptance of the schedule shall not constitute a representation by OWNER that the work can be completed as shown on the schedule.

3.02 SUBMITTALS

A. In addition to the above scheduling requirements, CONTRACTOR will be required to submit a complete and detailed listing of anticipated submittals during the course of the Contract. CONTRACTOR will coordinate his submittals with those of his subcontractors and suppliers and will identify each submittal as specified. The anticipated submission due date for each submittal must be indicated along with the date on which its return is anticipated. For planning purposes, shop drawing submittals will usually be returned twenty (20) working days after receipt. However, longer durations for review will not be considered a basis for a claim unless the project critical path is delayed thereby. Durations shown for review shall
be understood to share available float. Submissions, the review of which is on the critical path, shall be clearly marked in red with the words "Critical Path" by CONTRACTOR at the time of submission.

B. The Submittal Schedule must be submitted within twenty (20) working days from the Notice to Proceed. The Submittal Schedule will then be accepted or revised as required and CONTRACTOR will incorporate the dates and review durations into his CPM Schedule.

3.03 SCHEDULE UPDATES

A. A monthly Schedule Update Meeting will be held one (1) week prior to the progress meeting at the construction site to review and update the CPM Schedule. The Schedule Update Meeting will be attended by ENGINEER and CONTRACTOR. Actual progress of the previous month will be recorded and scheduling of future work activities will be reviewed. The duration of activities and their logical connections may be revised as needed. Decisions made at these meetings and agreed to by all parties are binding with the exception that no contractual completion dates will be modified without formal written requests and acceptance as specified herein. CONTRACTOR must provide the following information for each update at a minimum:

1. Actual start and finish dates for all completed activities.

2. Actual start dates for all started but incomplete activities and estimated remaining durations.

B. Provide a Monthly Progress Status Report, which provides a narrative explanation of progress identified in the revised construction schedule. The report shall indicate the following items:

1. Summarize revisions made to the Construction Schedule since the previous submittal.

2. Work completed during the reporting period.

3. Work anticipated to be started during the next period, including those activities already in progress.

4. Problem areas, anticipated delays, and their impact on the schedule.

5. Corrective action recommended, and its effect.

6. The effect of changes on schedules of other prime Contractors.

8. An evaluation of the overall status of the schedule for the job.

C. Failure to provide update information listed in 3.03.A and B above, or failure to attend the Monthly Progress Meeting may result in CONTRACTOR not receiving progress payments.

PART 4 - CONTRACT COMPLETION TIME

4.01 CAUSES FOR EXTENSIONS OF TIME

A. The Contract Times will be adjusted only for causes specified in this Contract. In the event CONTRACTOR requests an extension of Contract Time, he shall furnish justification and supporting evidence per requests specified elsewhere in these Contract Documents. ENGINEER will after receipt of such justification and supporting evidence, make findings of fact and will advise CONTRACTOR in writing thereof. If ENGINEER finds that CONTRACTOR is entitled to an extension of Contract Time under the provisions of the Contract, ENGINEER's determination as to the total number of days extensions shall be based upon the current accepted and updated CPM schedule and on all data relevant to the extension. Such data shall be included in the next monthly updating of the schedule. CONTRACTOR acknowledges and agrees that actual delays in activities, which, according to the CPM schedule, do not affect any contract completion date shown by the critical path in the network, do not have any effect on the Contract Time, and therefore will not be the basis for a change in Contract Time.

B. Contract Time extensions as a result of weather delays will be based only on the following criteria.

1. General Requirements: Even though a cause of delay meets any, or all, of the conditions stated herein, it shall in all cases be presumed that no extension, or further extension, of time is due unless CONTRACTOR shall demonstrate that the delay is justified and had an impact to the critical path of the updated CPM schedule for the delay period. To this end, CONTRACTOR shall maintain adequate records supporting any claim for an extension of time and shall submit such records, including a revised CPM schedule showing the impact of the delay, with the claim. Claims due to weather shall be submitted on a monthly basis and within five days after the end of the previous month of such delay.

2. ENGINEER will determine CONTRACTOR’s entitlement to an extension of the Contract Time, but in no event shall an extension be granted for
days outside the contract period. The County daily records, maintained by the Water Reclamation Facility staff, shall be the official source for weather data related to precipitation and temperature. A time extension of no more than one day will be granted for one day of lost work, regardless of the number of allowable reasons for lost time. The period of any extension of time shall be only for the portion of the contract actually delayed due to the abnormal weather conditions. Any extension of Contract Time allowed under any of the following conditions shall be considered non-compensable and have no impact on Contract Price.

(a) If the total inches precipitation in a given month is less than the average stated below in Figure 1, no time extension due to precipitation will be allowed. If the average inches of precipitation for the month is exceeded, the following formula will be used to calculate the number of days allowed as a time extension due to precipitation during the month in question:

\[
\text{Total actual days of precipitation greater than one-tenth (0.10") inch} - \text{Less expected precipitation days from Figure 2} = \text{days allowable due to precipitation}
\]

(b) Three inches (3”) or more of snow cover is considered to be justification for a one-day time extension for each day of 3” or more of snow coverage.

(c) A daily high temperature of twenty degrees Fahrenheit (20°F) or less is considered to be justification for a one-day time extension. Temperatures above the statistical mean are not considered to be justification for an extension of Contract Time.

**Figure 1**
Normal Precipitation (All Measurements are in Inches)

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**Figure 2**
Average Number of Calendar Days with Precipitation of 0.10 Inch or More

<table>
<thead>
<tr>
<th>JAN</th>
<th>FEB</th>
<th>MAR</th>
<th>APR</th>
<th>MAY</th>
<th>JUN</th>
<th>JUL</th>
<th>AUG</th>
<th>SEP</th>
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<th>NOV</th>
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<td>6</td>
<td>5</td>
<td>5</td>
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</table>
(Information contained in Figures 1 and 2 are as provided by the Virginia State Climatology Office at the University of Virginia, Department of Environmental Sciences from U.S. National Oceanic and Atmosphere Administration official publication *Climatography of the United States, No. 20*)

4.02 ADJUSTMENT BY OWNER

A. From time to time it may be necessary for the Contract schedule and/or Contract Times to be adjusted by OWNER due to the effects of job conditions, acts or omissions of other Contractors not directly associated with this contract, act of God, technical difficulties, strikes, unavoidable delays on the part of OWNER or his representatives, and other enforceable conditions which may indicate schedule adjustments and/or completion time extension. Under such conditions, OWNER shall direct CONTRACTOR to reschedule the work to reflect the changed conditions, and CONTRACTOR shall revise his schedule accordingly. Schedule extensions affecting the Contract Time shall be granted only by OWNER in writing. No additional compensation shall be made to CONTRACTOR for such schedule changes except for unavoidable overall Contract delays, in which case CONTRACTOR shall take all possible action to minimize any time extension. OWNER, therefore, has the right to accelerate the schedule and CONTRACTOR will be compensated for such acceleration as long as such acceleration is not required through fault of CONTRACTOR. It is specifically noted that available Project Float in the CPM schedule may be used by OWNER and his representative, as well as by CONTRACTOR.

4.03 FLOAT TIME

A. Without obligation to extend the overall completion date or any intermediate completion dates set out in the CPM network, OWNER may initiate changes to the Contract work that absorb float time. OWNER-initiated changes that affect the critical path on the CPM network shall be the sole grounds for extending (or shortening) said completion dates. CONTRACTOR initiated changes that encroach on the float time identified in the CPM network may be accomplished with OWNER's concurrence. Such changes, however, shall give way to OWNER-initiated changes competing for the same float time.

END OF SECTION
SECTION 01400

QUALITY CONTROL

PART 1 - GENERAL

1.01 CODES, RULES, PERMITS AND FEES

A. General:

1. The Contractor shall comply with the Spotsylvania County Building Codes as well as the requirements of all permits obtained by the Owner or the Contractor.

2. The Contractor shall give all necessary notices, obtain all permits (except as otherwise noted herein) and pay all governmental taxes, fees, and other costs in connection with the work, file all necessary plans, prepare all documents and obtain all necessary approvals of all government departments having jurisdiction, obtain all required Certificates of Inspection and Approval for the work and deliver same to the Engineer, except as otherwise noted herein.

B. Included Items:

1. The Contractor shall include in his work, all labor, materials, services, apparatus, and drawings required to comply with all applicable laws, ordinances, rules and regulations, whether or not shown on the Drawings or specified.

C. Compliance:

1. All materials furnished and all work installed shall comply with the rules and regulations of the National Fire Protection Association, with all requirements of local utility companies, with the recommendations of the fire insurance rating organization having jurisdiction, and with the requirements of all governmental departments having jurisdiction.

2. The Contractor shall arrange for inspection and approval by the appropriate City Inspectors and shall pay all costs of these services.

D. Contractor Obtained Permits:

1. Erosion and Sediment Control/Land Disturbance Permit – processing fee.
1.02 MATERIALS AND WORKMANSHIP

A. All materials and equipment required for the work shall be new, unless otherwise specified, and of the best quality and especially adapted to the services required.

B. The Contractor shall furnish a superintendent who shall be constantly in charge of the installation of the work, together with all skilled workmen and labor required to unload, transfer, erect, connect up, adjust, start, operate, and test each system.

C. The Contractor shall locate and install all equipment which must be serviced, operated, or maintained in fully accessible positions. Such equipment shall include, but not be limited to, valves, unions, cleanouts, drain points, pressure gages, and controls. Minor deviations from the Drawings may be made to allow for better accessibility, but changes of significant magnitude or changes involving extra cost shall not be made without approval of the Engineer.

1.03 STANDARDS

A. Any reference to standards in the Contract Documents shall always imply the latest issue in effect including all amendments and errata at the time bids are taken, of said standards unless otherwise stated.

B. Abbreviations for various organizations which may be used in these Specifications are as follows:

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Organization</th>
</tr>
</thead>
<tbody>
<tr>
<td>AA</td>
<td>Aluminum Association</td>
</tr>
<tr>
<td>AASHTO</td>
<td>American Association of State Highway and Transportation</td>
</tr>
<tr>
<td>ACS</td>
<td>American Chemical Society</td>
</tr>
<tr>
<td>ACI</td>
<td>American Concrete Institute</td>
</tr>
<tr>
<td>AFBMA</td>
<td>Anti-Friction Bearing Manufacturers Association</td>
</tr>
<tr>
<td>AGA</td>
<td>American Gas Association</td>
</tr>
<tr>
<td>Abbreviation</td>
<td>Organization</td>
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<td>--------------</td>
<td>--------------</td>
</tr>
<tr>
<td>AGMA</td>
<td>American Gear Manufacturers Association</td>
</tr>
<tr>
<td>AHDGA</td>
<td>American Hot Dip Galvanizers Association</td>
</tr>
<tr>
<td>AICHE</td>
<td>American Institute of Chemical Engineers</td>
</tr>
<tr>
<td>AISC</td>
<td>American Institute of Steel Construction</td>
</tr>
<tr>
<td>AASHTO</td>
<td>The American Association of State Highway Officials</td>
</tr>
<tr>
<td>ABPA</td>
<td>Acoustical and Board Products Association</td>
</tr>
<tr>
<td>AI</td>
<td>The Asphalt Institute</td>
</tr>
<tr>
<td>AIEE</td>
<td>American Institute of Electrical Engineers (Now IEEE)</td>
</tr>
<tr>
<td>AIMA</td>
<td>Acoustical and Insulating Materials Association</td>
</tr>
<tr>
<td>AISI</td>
<td>American Iron and Steel Institute</td>
</tr>
<tr>
<td>AMCA</td>
<td>Air Moving and Conditioning Association</td>
</tr>
<tr>
<td>ANSI</td>
<td>American National Standards Institute</td>
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<tr>
<td>API</td>
<td>American Petroleum Institute</td>
</tr>
<tr>
<td>APWA</td>
<td>American Public Works Association</td>
</tr>
<tr>
<td>AREA</td>
<td>American Railway Engineering Association</td>
</tr>
<tr>
<td>ASA</td>
<td>American Standards Association (Now ANSI)</td>
</tr>
<tr>
<td>ASCE</td>
<td>American Society of Civil Engineering</td>
</tr>
<tr>
<td>ASHRAE</td>
<td>American Society of Heating, Refrigerating, and Air Conditioning Engineers</td>
</tr>
<tr>
<td>ASME</td>
<td>American Society of Mechanical Engineers</td>
</tr>
<tr>
<td>ASTM</td>
<td>American Society of Testing and Materials</td>
</tr>
<tr>
<td>AWPA</td>
<td>American Wood Preservers Association</td>
</tr>
<tr>
<td>AWPB</td>
<td>American Wood Preservers Bureau</td>
</tr>
<tr>
<td>AWS</td>
<td>American Welding Society</td>
</tr>
<tr>
<td>AWWA</td>
<td>American Water Works Association</td>
</tr>
<tr>
<td>BIA</td>
<td>Brick Institute of America</td>
</tr>
<tr>
<td>CBRA</td>
<td>Copper and Brass Research Association</td>
</tr>
<tr>
<td>C&amp;P</td>
<td>Chesapeake and Potomac Telephone Company</td>
</tr>
<tr>
<td>CIPRA</td>
<td>Cast Iron Pipe Research Association</td>
</tr>
<tr>
<td>CRSI</td>
<td>Concrete Reinforcing Steel Institute</td>
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<tr>
<td>CS</td>
<td>Commercial Standard (U.S. Department of Commerce)</td>
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<tr>
<td>VDOT Spec</td>
<td>Road and Bridge Specifications Virginia Department of Transportation, Current Edition</td>
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<tr>
<td>E/A</td>
<td>Engineer and/or Architect</td>
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<tr>
<td>EEI</td>
<td>Edison Electric Institute</td>
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<tr>
<td>EPA</td>
<td>U.S. Environmental Protection Agency</td>
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<tr>
<td>FM</td>
<td>Factory Mutual</td>
</tr>
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<td>FTI</td>
<td>Facing Tile Institute</td>
</tr>
<tr>
<td>FS</td>
<td>Federal Specifications</td>
</tr>
<tr>
<td>GPM</td>
<td>Gallons Per Minute</td>
</tr>
</tbody>
</table>

Abbreviation - Organization

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<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Organization</th>
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<tbody>
<tr>
<td>ID</td>
<td>Inside Diameter</td>
</tr>
<tr>
<td>IPCEA</td>
<td>Insulated Power Cable Engineers Association</td>
</tr>
<tr>
<td>MBE</td>
<td>Minority Business Enterprise</td>
</tr>
<tr>
<td>MBMA</td>
<td>Metal Building Manufacturers Association</td>
</tr>
<tr>
<td>MSS</td>
<td>Manufacturers Standardization Society of the Valve and Fittings Industry</td>
</tr>
<tr>
<td>NAAMM</td>
<td>National Association of Architectural Metal Manufacturers</td>
</tr>
<tr>
<td>NBFU</td>
<td>National Bureau of Fire Underwriters</td>
</tr>
<tr>
<td>NBS</td>
<td>National Bureau of Standards</td>
</tr>
<tr>
<td>NCPI</td>
<td>National Clay Pipe Institute</td>
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<td>NCMA</td>
<td>National Concrete Masonry Association</td>
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<tr>
<td>NEC</td>
<td>National Electrical Code</td>
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<td>National Electrical Contractors Association</td>
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<td>NEMA</td>
<td>National Electrical Manufacturers Association</td>
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<tr>
<td>NFPA</td>
<td>National Fire Protection Association</td>
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<td>NPT</td>
<td>National Pipe Threads</td>
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<tr>
<td>NSF</td>
<td>National Science Foundation</td>
</tr>
<tr>
<td>OD</td>
<td>Outside Diameter</td>
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<tr>
<td>OFCCP</td>
<td>Office of Federal Contracts Compliance Programs</td>
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<tr>
<td>OSHA</td>
<td>U. S. Department of Labor, Occupational Safety and Health Administration</td>
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<td>PCA</td>
<td>Portland Cement Association</td>
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<tr>
<td>PCI</td>
<td>Prestressed Concrete Institute</td>
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<tr>
<td>PS</td>
<td>United States Products Standards</td>
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<tr>
<td>PSIG</td>
<td>Pounds Per Square Inch Gauge</td>
</tr>
<tr>
<td>RPM</td>
<td>Revolutions Per Minutes</td>
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<tr>
<td>SAE</td>
<td>Society of Automotive Engineers</td>
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<td>SCPI</td>
<td>Structural Clay Products Institute</td>
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<tr>
<td>SDI</td>
<td>Steel Decks Institute</td>
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<td>SJI</td>
<td>Steel Joists Institute</td>
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<tr>
<td>SPIB</td>
<td>Southern Pine Inspection Board</td>
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<tr>
<td>SMACNA</td>
<td>Sheet Metal and Air Conditioning National Association</td>
</tr>
<tr>
<td>SMSA</td>
<td>Standard Metropolitan Statistical Area</td>
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<tr>
<td>SSPC</td>
<td>Steel Structures Painting Council</td>
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<tr>
<td>STA</td>
<td>Station (100 feet)</td>
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<tr>
<td>TDH</td>
<td>Total Dynamic Head</td>
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<tr>
<td>TEMA</td>
<td>Tubular Exchanger Manufacturers Association</td>
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<tr>
<td>UL</td>
<td>Underwriter's Laboratories</td>
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<tr>
<td>USASI or</td>
<td>United States of America Standards Institute</td>
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<td>USAS</td>
<td>(Now ANSI)</td>
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<tr>
<td>USGS</td>
<td>United States Geological Survey</td>
</tr>
<tr>
<td>USC&amp;GS</td>
<td>United States Coast and Geodetic Survey</td>
</tr>
</tbody>
</table>
1.04 VERIFICATION OF DIMENSIONS

1. The Contractor shall be responsible for field verification of all dimensions of existing facilities and other items which are shown on the Contract Drawings.

1.05 TESTS OF MATERIALS AND EQUIPMENT

A. All material shall be subject to inspection, testing and approval of the Engineer before being incorporated in the work. Any work in which such materials are used without prior testing and approval shall be considered defective and unauthorized and will not be paid for. The Contractor shall perform such tests as required by the specifications in a timely fashion taking into account when the items will be incorporated in the work.

1.06 WATERTIGHTNESS OF STRUCTURES

A. See Sections 03410 Precast Concrete Structures, the testing of structures designed to contain liquid and the testing of structures designed to be dry.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION
SECTION 01410

TESTING AND LABORATORY TESTING SERVICES

PART 1 - GENERAL

1.01 PERFORMANCE REQUIREMENTS

A. CONTRACTOR shall provide testing and laboratory testing services to facilitate execution of required services specified in the Work.

1. Professional testing and laboratory testing services will be for inspections, soils and concrete testing and laboratory services as described in Specification Section 01410, 02200, 02500 and 03300 and as authorized and directed by the ENGINEER.

2. The CONTRACTOR shall pay for the services on a bi-weekly or monthly basis as required and shall submit documentation or payment with each monthly application for payment along with reports and documentation required by Sections 01410, 02200, or as referenced.

3. Payment for all testing and laboratory services required in the Work shall have been included under those items requiring testing, professional engineering, technicians or laboratory services as identified in the Specifications.

B. Employment of laboratory shall, in no way, relieve CONTRACTOR of obligations to perform work.

C. Concrete and soils testing services will be performed by an independent laboratory furnished by the CONTRACTOR, including retests performed as the result of defective work, which shall be borne by the CONTRACTOR.

D. Related Requirements in Other Parts of Contract Documents:

1. Inspections and testing required by laws, ordinances, rules, regulations, orders or approvals of public authorities, Conditions of Contract.

E. CONTRACTOR shall provide the services of an independent testing and laboratory that is satisfactory to the Owner and the ENGINEER. The independent testing and laboratory shall as a minimum be validated by the US Army Corps of Engineers to USACE ER 1110-1-8100 and ER 1110-1-261 to perform all soils and concrete inspections, testing and laboratory work as identified in Section 02200, 02500 and Section 03300. The laboratory shall provide professional engineering services and technical services as required for compliance with the specified performance objectives identified in the specified sections. The ENGINEER shall direct such
additional test and inspections as required or necessary in the performance of the work. The cost for testing identified for Sections 02200 and 03300 shall be deducted from the allowance provided in the Bid.

F. The CONTRACTOR shall be responsible to obtain and pay for all other testing and laboratory services as required by other Sections. The cost for those testing and laboratory services identified under other sections shall have been included in the sections. The cost for testing and laboratory services identified under other sections shall have been included in the sections. The cost for testing or laboratory services required by the CONTRACTOR for the CONTRACTOR’s construction requirements shall be paid for by the CONTRACTOR.

### 1.02 REFERENCES

A. American Society for Testing and Materials (ASTM):

B. American Society For Nondestructive Testing Inc.:
   1. SNT-TC-1A – Recommended Practice No. 1996
   2. CP-189 – Standard for Qualification and Certification of Nondestructive Testing Personnel

### 1.03 QUALIFICATION OF LABORATORY

A. Meet basic requirements of ASTM E329, SNT-TC-1A, and CP-189.

B. Authorized to operate in state in which Project is located.

C. Validated by the US Army Corps of Engineers to USACE ER 1110-1-8100 and ER1110-1-261 to perform all soils and concrete inspections, testing and laboratory work as identified in Section 02200 and Sections 03300.

D. Testing Equipment:
   1. Calibrated at reasonable intervals by devices of accuracy traceable to either:
      b. Accepted values of natural physical constants.
      c. ASTM

### 1.04 LABORATORY DUTIES
A. Cooperate with ENGINEER and CONTRACTOR; provide qualified personnel to perform Work after due Notice to Proceed.

B. Perform specified inspections, secure samples, and test materials.
   1. Comply with specified standards.

C. Promptly notify ENGINEER and CONTRACTOR of observed irregularities or deficiencies of Work, equipment and material.

D. Promptly submit written report of each test and inspection; one copy each to ENGINEER and OWNER, material supplier, and CONTRACTOR, and one copy to record document file. Each report shall include following:
   1. Date issued.
   2. Project title and number.
   3. Testing laboratory name, address, and telephone number.
   4. Name and signature of laboratory inspector.
   5. Date and time of sampling or inspection.
   6. Record to temperature and weather conditions if test performed in field.
   7. Date of test.
   8. Identification of product and Specification section.
   9. Location of sample or test in Project.
   10. Type of inspection or test.
   11. Results of tests and compliance with Contract Documents.
   12. Interpretation of test results, when requested by ENGINEER or DESIGN ENGINEER.

E. Perform additional tests as required by ENGINEER and CONTRACTOR.

1.05 LIMITATIONS OF AUTHORITY OF TESTING LABORATORY

A. Laboratory is not authorized to:
   1. Release, revoke, alter or enlarge on requirements of Contract Documents.
   2. Approve or accept any portion of Work.
   3. Perform duties of CONTRACTOR.

1.06 CONTRACTOR'S RESPONSIBILITIES

A. Cooperated with laboratory personnel and provide access to Work.

B. Provide to laboratory preliminary design mix proposed to be used for concrete and other material mixes which require control by testing laboratory.
C. Furnish copies of product test reports.

D. Furnish incidental labor and facilities.
   1. Provide access to Work to be tested.
   2. Obtain and handle samples at Project site or at source of product to be tested.
   3. Facilitate inspections and tests.
   4. Store and cure test samples.

E. Notify laboratory, ENGINEER sufficiently in advance of operations to allow for laboratory assignment of personnel and scheduling of tests.
   1. When tests or inspections cannot be performed after such notice, reimburse OWNER for laboratory personnel and travel expenses incurred due to CONTRACTOR’s negligence.

F. Make arrangements with laboratory and pay for additional samples and tests required for CONTRACTOR’s convenience.

G. Employ and pay for services of testing laboratory to perform additional inspections, sampling, and testing required when initial tests indicated Work does not comply with Contract Documents.

PART 2- PRODUCTS   (Not Used)

PART 3- EXECUTION  (Not Used)

END OF SECTION
SECTION 01510

TEMPORARY UTILITIES

PART 1 - GENERAL

1.01 SCOPE OF WORK

A. Furnish, install and maintain temporary utilities required for construction and remove those temporary utilities upon completion of Work.

1.02 REQUIREMENTS OF REGULATORY AGENCIES

A. Comply with National Electric Code.

B. Comply with Federal, State, and local codes and regulations and with utility company requirements.

C. Comply with County and State Health Department Regulations.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Materials may be new or used, but must be adequate in capacity for the required usage, must not create unsafe conditions, and must not violate requirements of applicable codes and standards.

2.02 TEMPORARY ELECTRICITY AND LIGHTING

A. Arrange with utility company and Owner to provide service required for power and lighting, and pay all costs for service and for power used in the construction, testing and trial operation prior to final acceptance of the work by the Owner as stipulated by the Engineer.

B. Install circuit and branch wiring, with area distribution boxes located so that power and lighting are available throughout the construction by the use of construction-type power cords.

C. Provide temporary lighting in all work areas sufficient to maintain a lighting level during working hours not less than the lighting level required by applicable codes, OSHA Standards, and safety regulations.

2.03 TEMPORARY HEAT AND VENTILATION
A. Provide temporary heat and ventilation as required to maintain adequate environmental conditions to facilitate progress of the Work, to meet specified minimum conditions for the installation of materials, and to protect materials and finishes from damage due to temperature or humidity.

B. Provide adequate forced ventilation of enclosed areas for curing of installed materials, to disperse humidity, and to prevent hazardous accumulations of dust, fumes, vapors or gases.

C. Portable heaters shall be standard approved units complete with controls.

D. Pay all costs of installation, maintenance, operation and removal, and for fuel consumed.

2.04 TEMPORARY WATER

A. Contractor shall be required to meter, provide and pay for all water required for construction and consumptive purposes. Contact the Spotsylvania County Department of Utilities to coordinate obtaining potable water from the county water system.

B. Install at each and every connection to the water supply a backflow preventer meeting the requirements of ASA A40.6, latest revision.

2.05 TEMPORARY SANITARY FACILITIES

A. Approved sanitary convenience for the use of laborers and others employed on the work, properly secluded from public observation shall be constructed and maintained by the Contractor, in such manner and at such points shall be approved or directed and their use shall be strictly enforced. The collections in the same shall be disinfected and/or removed when and as required.

B. The Contractor shall provide and maintain, in a neat and sanitary condition, such accommodations for the use of his employees, as may be necessary to comply with the requirements and regulations of the Department of Health or of other bodies or tribunals having jurisdiction thereof. He shall commit no public nuisance.

2.06 TEMPORARY PUMPING AND SITE DRAINAGE

A. Keep the site free from water at all times to permit continuous access and to prevent damage to the work.
2.07 SECURITY

A. Full time watchmen will not be specifically required as a part of the Contract, but the Contractor shall provide inspection of work area daily and shall take whatever measures as necessary to protect the safety of the public, workmen, and materials, and provide for the security of the site, both day and night.

2.08 DUST AND MUD CONTROL

A. Take all necessary precautions to control dust and mud associated with the Work of this Contract, as required by the Virginia Erosion and Sediment Control Manual and subject to the review of the Engineer. In dry weather, spray dusty areas daily with water or provide other approved means in order to control dust. Take necessary steps to prevent the tracking of mud onto adjacent streets and highways.

2.09 CONTRACTOR'S STORAGE SHEDS

A. Provide storage sheds for the performance of the work and protection of materials and equipment.

1. Provide commercial grade chain link fence to prevent trespass by the public onto the construction trailer and storage site.

2. Coordinate location of temporary fencing with property owner and Owner.

PART 3 - EXECUTION

3.01 GENERAL

A. Comply with the applicable requirements specified in Division 15 –Mechanical.

B. Maintain and operate systems to assure continuous service.

C. Modify and extend systems as work progress requires.

3.02 REMOVAL

A. Completely remove temporary materials and equipment when their use is no longer required.

B. Clean and repair damage caused by temporary installations or use of temporary facilities.

C. Restore permanent facilities used for temporary services to specified condition.

END OF SECTION
SECTION 01710

CLEANING UP

PART 1 - GENERAL

1.01 GENERAL

1. During the construction duration, the Work and the adjacent areas affected thereby shall be kept cleaned up and all rubbish, surplus materials, and unneeded construction equipment shall be removed and all damage repaired so that the public and property owners will be inconvenienced as little as possible.

2. Where material or debris has washed or flowed into or been placed in existing watercourses, ditches, gutters, drains, pipes, structures, work done under this contract, or elsewhere during the course of the Contractor’s operations, such material or debris shall be entirely removed and satisfactorily disposed of during the progress of the Work. Ditches, channels, drains, pipes, structures and work, etc., shall, upon completion of the Work, be left in a clean and neat condition.

3. On or before the completion of the Work, the Contractor shall, unless otherwise directed and permitted in writing, tear down and remove all temporary buildings and structures built by him; shall remove all temporary works, tools and machinery or other construction equipment furnished by him; shall remove, acceptably disinfect, and cover all organic matter and material containing organic matter in, under and around privies, houses and other buildings used by him; shall remove all rubbish from any grounds which he has occupied; and shall leave the roads and all parts of the premises and adjacent property affected by his operations in a neat and satisfactory condition.

4. The Contractor shall thoroughly clean all materials and equipment installed by him and his subcontractors, and on completion of the Work shall deliver it undamaged and in fresh and new-appearing condition.

5. The Contractor shall restore or replace, when and as directed, any public or private property damaged by his work, equipment or employees to a condition at least equal to that existing immediately prior to the beginning of operations. To this end, the Contractor shall do all required necessary street, alley, walk, and landscaping work. Suitable materials, equipment and methods shall be used for such restoration. The restoration of exiting property or structures shall be done as promptly as practicable as work progresses and shall not be left until the end of the Contract Period.

PART 2 - PRODUCTS (Not Used)
PART 3 - EXECUTION (Not Used)

END OF SECTION
SECTION 01740

WARRANTIES AND BONDS

PART I - GENERAL

1.01 SCOPE OF WORK

A. The work included in this section includes compiling specified warranties and bonds, reviewing submittals to verify compliance with the Contract Documents, submitting warranties and bonds to the Engineer for review and transferring said warranties and bonds to the Owner as required in the General Conditions and as specified herein.

1.02 SUBMITTAL REQUIREMENTS

A. Assemble warranties, bonds and service and maintenance contracts, executed by each of the respective manufacturers, suppliers and subcontractors in an appropriate sized three ring binders.

B. Provide two (2) signed original copies of each document.

C. Provide a Table of Contents, neatly typed and in proper sequence listing contents of binder. Provide complete information for each document including:

1. Product or work Item covered.

2. Name of Firm that supplied or manufactured product, with name of principal, address and telephone number.


4. Date of beginning of warranty, bond or service and maintenance contract.

5. Duration of warranty, bond or service and maintenance contract.

6. Ending date of warranty, bond or service and maintenance contract.

7. Provide information for Owner’s personnel:

   a. Proper procedure in case of failure.

   b. Instances which might affect validity of warranty or bond.
8. Contractor and Subcontractors name, street address and telephone number of responsible principal.

1.03 FORM OF SUBMITTALS

A. Prepare in duplicate packets.

B. Format:
   1. Size 8 ½ inches x 11 inches, punched for standard three ring binder.
   2. Fold larger size sheets to proper size and provide clear plastic sleeves for insertion into binder
   3. Cover: Identify each binder with a typed or printed title “WARRANTIES AND BONDS”. Include on cover the title of the project, name of Owner and name of Contractor.

C. Binders shall be commercial grade, three ring binders with durable and cleanable plastic covers. The maximum binder width shall be 2 inches.

1.04 WARRANTY SUBMITAL REQUIREMENTS

A. For all major pieces of equipment, submit a warranty from the equipment manufacturer. The manufacturer’s warranty period shall be concurrent with the Contractor’s for one (1) year, unless otherwise specified, commencing at the time of Final Completion.

B. Contractor shall be responsible for obtaining certificates for equipment warranties for all equipment specified under any division that lists for more than $1000. The Engineer reserves the right to request warranties for equipment not classified as major. The Contractor shall still warrant equipment not classified as “major” in the Contractor’s one year warranty period even though certificates of warranty may not be required.

C. In the event that the equipment manufacturer or supplier is unwilling to provide a one year warranty commencing at the time of Final Completion, the Contractor shall obtain for the manufacturer a two (2) year warranty commencing at the time of delivery to the job site. The two year warranty from the manufacturer shall not relieve the Contractor of the one year warranty starting at the time of Final Completion.
PART II - PRODUCTS
(Not Used)

PART III - EXECUTION
(Not Used)

END OF SECTION
SECTION 02200

EARTHWORK, EXCAVATION, TRENCHING
AND BACKFILLING

PART 1 - GENERAL

1.01 SCOPE OF WORK

A. The Contractor shall provide all labor, materials, equipment and services necessary for, and incidental to, the preparation of the site, excavating, trenching, drainage, dewatering, sheeting, bracing, backfilling, compacting, grading, topsoiling, seeding, mulching and protection of the work as shown on the Drawings, as herein specified, and in accordance with the VDOT Standard Specifications.

B. The Contractor shall accept the site in the condition in which it exists at the time of the award of the Contract.

C. The Engineer will determine whether materials that are to be used in the work are suitable or unsuitable. All excavated excess or unsuitable materials shall be removed from the site by the Contractor. Materials removed from the site shall be disposed of at a permitted, off-site disposal location of the Contractor’s choosing, at no additional expense to the Owner.

1.02 RELATED WORK INCLUDED ELSEWHERE:

A. Section 00510 - BID PROPOSAL
B. Section 01130 - MEASUREMENT AND PAYMENT
C. Section 01300 - SUBMITTALS
D. Section 02223 – VIBRATION CONTROL

1.03 QUALITY ASSURANCE

A. Codes and Standards

1. Standard Specifications: References in this Section to Standard Specifications or Standard Details shall mean the following, along with the latest revisions thereto, and are hereby made part of this specification. In case of conflict between the Standard Specifications or Standard Details and this contract specification, this contract specification shall govern.
a. Virginia Department of Transportation "Road and Bridge Specifications", current edition, and "Road and Bridge Standards", current edition, with the latest incorporated revisions.

2. The following American Association of State Highway and Transportation Officials (AASHTO) Standards in effect on the date bids are received form a part of this Specification to the extent indicated by the following references:

M6      Fine Aggregate for Portland Cement Concrete  
M43     Standard Sizes of Coarse Aggregate for Highway Construction  
M145    Classification of Soils and Soil-Aggregate Mixtures  
T89     Determining the Liquid Limit of Soils  
T90     Determining the Plastic Limit and Plasticity Index of Soils  
T99     Moisture-Density Relations of Soils Using a 5.5-lb. Rammer and 12-in. Drop  
T119    Slump of Portland Cement Concrete  
T180    Moisture-Density Relations of Soils Using a 10-lb. Rammer and 18-in. Drop  
T191    Density of Soil In-Place by the Sand-Cone Method  
T206    Penetration Test and Split-Barrel Sampling of Soils  
T238    Density of Soils and Soil-Aggregate In-Place by Nuclear Methods  
T239    Moisture Content of Soil and Soil-Aggregate In Place by Nuclear Methods  
T265    Laboratory Determination of Moisture Contents of Soils

3. All work shall comply with Occupational Safety and Health Regulations for Construction of the Code of Federal Regulations.

B. Supervision and Testing

1. Supervision and testing shall be in accordance with the following. The Contractor shall employ the services of an independent, professional testing consultant, specializing in field sampling, field testing, and laboratory testing. Field and laboratory testing of concrete, pavement and soils shall be the responsibility of the Contractor. Payment shall be included in the appropriate price bid. Costs incidental to the transportation of samples shall be borne by the Contractor.

2. Construction of controlled fills shall be done under continuous supervision of the Engineer. The Contractor shall provide 48 hours notice to the Engineer, and no controlled fills shall be constructed unless the Engineer is on the site. The Contractor shall allow safe access for the Engineer to
all parts of the project at all times. The Contractor shall keep the Engineer informed of all construction activity of the project and the Contractor’s anticipated daily schedules. The Contractor shall perform excavation and subgrade preparation under the direction and approval of the Engineer.

3. All materials to be used in the work shall be tested by a certified, independent laboratory paid for by the Contractor, prior to use to show conformance with the requirements of these Specifications. Test reports or material certifications shall be submitted to the Engineer prior to use of any material in the work. Any change in the source or change in the character of the material shall require the Contractor to retest and resubmit for approval.

4. Field compaction tests of the density and moisture content of fill and backfill shall be performed by the Contractor’s qualified testing consultant at no additional cost the Owner. Upon completion of each layer of fill in a designated area, the Contractor shall be required to allow time for the Engineer to inspect the tests. Copies of test results shall be furnished to the Engineer within 24 hours of conclusion of tests.

5. Where sheepsfoot rollers are used, the soil may be disturbed to a depth of several inches. Compaction tests shall be taken in the compacted material below the disturbed surface. In this case the Contractor shall be required to use its equipment (such as bulldozer blade) to cut out a smooth surfaced spot at any point requested by the Engineer on which to perform the test.

6. When test results indicate, as determined by the Engineer, that compaction is not as specified, the material shall be removed, replaced and recom pacted to meet the specification requirements. Tests on recom pacted areas shall be performed to determine conformance with the specification requirements. Inspections and test results shall be certified by a registered professional engineer, stating that the tests and observations were performed by or under the direct supervision of the engineer, the results are representative of the materials or conditions being certified by the tests, and the results are in conformance with the project specifications.

7. Tests shall be performed in randomly selected locations and in sufficient numbers to insure that the specified density is being obtained. The following number of field density tests shall be the minimum acceptable for each type operation:

   a. Bedding and backfill in trenches: One test per 100 linear feet in each lift.
   b. Structures: One test per 50 square feet or fraction thereof in each
1.04 SUBMITTALS

A. Sources of borrow, aggregate, porous fill and furnished topsoil shall be submitted to the Engineer for approval.

B. Gradation curves for all borrow, aggregate, porous fill, and furnished topsoil to be used shall be submitted to the Engineer for approval.

C. Standard Proctor (AASHTO T99), Modified Proctor (AASHTO T180), Natural Moisture Content (AASHTO T265), and Atterberg Limits (AASHTO T89 and T90) test results for all proposed on-site material, borrow and aggregate shall be submitted to the Engineer for approval.

D. Delivery Tickets

   1. The Contractor shall submit delivery tickets with each load of borrow, aggregate, porous fill and furnished topsoil material brought to the site under the authorization of the Engineer showing the following information:

      a. Name and location of supplier or source.
      b. Type and amount of material delivered by volume and weight.
      c. Test information on the material as required by this Specification.

E. Manufacturer’s product catalog data for filter fabric to be furnished, shall be submitted to the Engineer for approval, showing compliance with the specification requirements of PART 2 – PRODUCTS.

F. A Compaction Plan shall be submitted to the Engineer for approval, including a list of proposed compaction equipment to be used, manufacturer’s specifications and catalog data, and the Contractor’s plan for compaction in the work.

G. Excavation Support and Dewatering Systems

   1. For all excavations requiring sheeting and shoring, the Contractor shall submit working drawings and calculations for the design of the excavation support and dewatering systems. The Contractor shall design the excavation support and dewatering systems in accordance with any design criteria shown on the Contract Drawings. The working drawings and calculations shall be certified by a professional engineer licensed to practice in the Commonwealth of Virginia.
2. The working drawings and calculations for the dewatering systems shall include the following information:
   a. Planned method of dewatering.
   b. Excavation plan.
   c. Location of the water table before and during dewatering.
   d. Location and capacity of such facilities as dewatering wells, well points, sumps, collection and discharge lines, proposed standby unit, and protective fills and ditches required for control of ground water and surface water.

3. The Contractor shall obtain and submit copies of all permits that may be required for installation of well points and dewatering wells.

4. The Contractor shall be responsible for determining the existing subsurface conditions for the excavation support systems and dewatering systems. The Owner does not guarantee or warrant the conditions actually encountered on this project. The Owner will not be held responsible for the basis of claims by the Contractor or any other parties in the execution of the excavation support system. The Contractor's submittal of the Excavation Support Systems and Dewatering Systems is for information purposes only.

H. Methods for temporary cofferdam structures and culverts at river and stream crossings shall meet the requirements of Paragraph 3.19 Stream Crossings, and shall be submitted to the Engineer for approval, including a detailed description of the means, methods, equipment and materials used, and methods included with the requirements of Paragraph 3.06 Dewatering, Drainage And Pumping.

1.05 JOB CONDITIONS

A. Subsurface Investigations

1. The Owner performed a limited number of subsurface test borings. The approximate locations of the borings are shown on the Drawings. Logs of the test borings are included in Appendix A. No borings were taken in the heavily wooded areas of the alignments. The Contractor is encouraged to walk the gravity sewer alignments to familiarize itself with the conditions.

2. Boring samples are presently being stored in Richmond, Virginia and they may be reviewed at a time acceptable to the Owner and the Engineer.

5. The Contractor shall become familiar with the site and the subsurface conditions. Ignorance of conditions will not be accepted as a basis of claim for additional compensation. The Owner does not warrant or
guarantee that the conditions actually encountered in the prosecution of the work under this contract will be the same as the conditions indicated by the borings. No additional compensation will be allowed the Contractor because of subsurface conditions actually encountered in the work.

6. The Contractor shall determine to its own satisfaction the ground water conditions and character and type of soil, decomposed rock, rock and other material to be encountered in the work to be done under this Contract.

7. If the data contained in the test boring logs is not sufficient for bid preparation, the bidder may make its own investigation and tests. Any testing by the Contractor shall be approved and coordinated through the Owner. Contact Scott Powell at (540) 507-7330 to coordinate Contractor testing.

B. Existing Utilities

1. The existing utilities shown on the Drawings are from available records and field surveys. The Contractor shall verify all information to its own satisfaction. The Contractor shall test pit existing utilities which impact construction two weeks in advance of excavation.

2. Should uncharted piping or other utilities be encountered during excavation, the Contractor shall notify the Engineer and the utility owner immediately. The Contractor shall cooperate with the Engineer and the utility owners in keeping services and facilities in operation.

3. Utilities designated to remain in place or which serve adjacent structures are to be protected and maintained at all times during construction. Active utility lines damaged in the course of construction operations shall be repaired or replaced immediately at no cost to the Owner, the Engineer, or utility owner.

4. The Contractor shall demolish and completely remove from the site existing underground utilities which are designated to be removed.

PART 2 - PRODUCTS

2.01 MATERIALS
A. Borrow material shall meet the requirements of AASHTO M145 soil groups A-1, A-2-4, A-2-6, or A-3 and shall be furnished from a specific source or sources approved in writing by the Engineer. Group A-3 (Fine Sand) material shall be used only where specified on the Drawings or as required by the Engineer.

B. Select material shall meet the following requirements and shall be used only where specified on the Drawings or as required by the Engineer, and shall be furnished from a specific source or sources approved in writing by the Engineer:

1. VDOT No. 21A or 21B, Types I or II (Dense Graded Aggregate)

C. Porous fill material shall meet the following requirements and shall be used only where specified on the Drawings or as required by the Engineer, and shall be furnished from a specific source or sources approved in writing by the Engineer:

1. VDOT No. 57 Aggregate (AASHTO M43)
2. VDOT No. 8 Sand (AASHTO M43)

D. Filter Fabric

1. Filter fabric shall be a nonwoven fabric consisting of continuous filaments of polyester or polypropylene formed into a stable network by needle punching. The fabric shall be inert to commonly encountered chemicals and hydrocarbons, mildew and rot resistant, and insect and rodent resistant. Fabric shall have a mass per unit area of at least 16 ounces per square yard as determined by ASTM D5261.

2. The fabric shall provide a permeable layer or media, while retaining the soil matrix. It shall be provided in rolls wrapped with protective covering to protect the fabric from mud, dirt, and debris. The fabric shall be “Trevira” as manufactured by Hoechst or “Fibretex” as manufactured by Acme STW, Inc., or approved equal.

3. The fabric shall be used only where specified on the Drawings or as required by the Engineer.

E. Class I riprap for slope protection and stabilization shall meet the following requirements and shall be used only where specified on the drawings or as required by the Engineer. The stone shall be hard, durable, resistant to weathering, angular in shape, free from overburden, spoil, shale, slate and organic material, and shall meet the quality and size requirements of Section 204 of the VDOT STANDARD SPECIFICATIONS.

F. Suitable material for backfills may be from the excavation or from other sources. The material shall be free from vegetable matter, organic material, sludge, grit,
trash, muck, roots, logs, stumps, frozen material or other deleterious substances. Material shall be clean earth. Rubble and construction debris shall not be used in the work. Rubber, ashes, cinders and other miscellaneous inorganic fill substances removed from required excavations within the project and which in the judgment of the Engineer will decompose, consolidate further, or shrink appreciably within the fill may not be incorporated in the fill. Except as otherwise specified or approved, the material shall not contain rocks or lumps larger than 6 inches in greatest dimension. No rocks or lumps larger than 3 inches in greatest dimension will be permitted within 12 inches of subgrade, or within 12 inches of pipes in all directions, or within 24 inches of any structure during backfill. The material shall not contain mica in quantities which, in the judgment of the Engineer, are sufficient to affect compaction characteristics. Materials having a maximum dry density of less than 105 pounds per cubic foot (AASHTO T99) and materials having a Unified Soil Classification of CH or MH, shall not be used unless specifically approved in writing by the Engineer.

Prior to placing and compacting suitable material as fill and backfill, the moisture content shall be brought to the specified moisture content by either aerating the material if it is too wet, or spraying the material if it is too dry. The material shall by thoroughly mixed before compaction for uniform distribution of moisture content.

G. Suitable material is any material meeting the quality requirements specified above, for the particular location and application specified, which is not frozen and which has a moisture content at the time it is placed that enables the material to be compacted to the density specified.

H. Unsuitable material is any material not meeting all the requirements for suitable material.

I. Topsoil shall meet the requirements of Paragraph 3.17 TOPSOIL.

1. Salvaged topsoil shall be existing topsoil stripped from the site within the prescribed limits.

2. Furnished topsoil shall be the Contractor's responsibility to obtain from approved off-site sources.

J. Clay dam material shall meet the following requirements and shall be used only where specified on the Drawings or as required by the Engineer, and shall be furnished from a specific source or sources approved in writing by the Engineer:

1. Soil Groups A-6 or A-7 (AASHTO M145)

PART 3 - EXECUTION
3.01 SITE PREPARATION

A. All rubble, trash, unusable and unsuitable material, pavements, concrete structures, piping, sludge, grit, etc. within areas required to be filled, excavated or graded, except as otherwise specified or shown, shall be fully removed from the site and disposed of by the Contractor, at no additional expense to the Owner. Such material may exist on the site. The Contractor shall obtain and pay for all necessary permits related to this disposal.

3.02 CLEARING AND GRUBBING

A. All trees, stumps, roots, brush, grass, etc., shall be fully removed within the easements except where prohibited by the COE permit. Contractor may store removed materials for reinstallation, weather dependant. Stored materials shall be moved to a storage area to allow for proper care and watering. All stored trees, shrubs, bushes, etc. shall have the root ball wrapped in burlap for protection.

B. All materials resulting from the clearing and grubbing operation, not to be stored for reinstallation, shall be disposed of by the Contractor off the site, at his expense. The Contractor shall obtain and pay for all necessary permits related to this disposal.

C. Trees outside of the immediate area of construction shall be protected from damage.

3.03 BLASTING

A. Use of explosives for blasting rock excavation may be required. However, no blasting will be permitted within 10’ of an existing utility.

B. The use of explosives shall conform to Section 107.11 and other applicable sections of the VDOT Standard Specifications.

C. The Contractor shall be responsible for obtaining all permits required for blasting.

D. Rock excavation and blasting shall be unclassified and included as an incidental cost of the appropriate bid item. No measurement will be made for rock excavation or blasting and no additional payments will be made for rock excavation or blasting.

3.04 EXCAVATION AND SUBGRADE PREPARATION

A. Excavation for grading, pavements, walls, piers, slabs, footings, structures, trenches, utility systems and their appurtenances shall be unclassified and shall
consist of the excavation of whatever material is encountered to the lines, grades, and sections shown on the Drawings and specified, including such excavation as is necessary for all ditches, curbs and other features. Payment for excavation shall be included in the lump sum price, unit price, or contingent unit price bid in accordance with Section 01130 MEASUREMENT AND PAYMENT of this Specification.

B. Suitable material removed from the excavation shall be reused in the grading, filling, backfilling and preparation of subgrade for pavements, structures, and trenches and at such other places as directed, to the extent required to complete the work. The Contractor shall properly store or stockpile and protect in approved manner, all materials that are to be reused in the work. Prior to placing and compacting the material as fill and backfill, the moisture content shall be brought to the specified moisture content by either aerating the material if it is too wet, or spraying the material if it is too dry. The material shall by thoroughly mixed before compaction for uniform distribution of moisture content. The Contractor shall replace, at his own expense, material that was suitable when excavated, which has subsequently become unsuitable because of careless, neglectful, wasteful or unprotected storage. All unsuitable or excess material removed from the excavation shall be removed from the site and disposed of by the Contractor at no additional expense to the Owner, except where disposal on the site is specifically provided for and approved in writing by the Engineer.

C. During construction, the grading operations shall be performed in such a manner that the excavations shall be well drained at all times. Sufficient grading shall be performed during the progress of the work so that no water, at any time, is allowed to flow towards the walls of the structures or trenches. The entire site shall be well drained and free from water pockets. When necessary, sumps shall be provided and pumped continuously. The Contractor shall maintain and keep all ditches open and free from soil and debris while in service or until final acceptance of the work, and all grading shall be done on neat, regular lines. All work shall be done in proper sequence with all other associated operations. Before any slab or surfacing is placed, all utilities to be covered shall be installed and all drainage facilities shall be installed which are required to permit free and uninterrupted flow of the surface and ground water from the site or to pumping sumps.

D. Preparation of the surface: Before depositing fill material, the surface of the ground shall be cleared of all refuse, rubble, and other debris. All vegetable matter, mud, muck, sludge and unsuitable soils shall be removed from the surfaces upon which fills are to be placed and the surface shall be leveled. Openings, animal burrows, stump holes, old pipes and other holes and depressions shall be eliminated, filled or cleaned as required.
E. Where fills are made on hillsides or slopes, the slope of the original ground upon which the fill is to be placed shall be plowed or scarified deeply or where the slope ratio of the original ground or rock surface is steeper than five horizontal to one vertical, the ground or rock shall be stepped or benched.

F. The areas shall then be proofrolled with a minimum of 3 passes of a large vibratory roller capable of exerting a dynamic force of at least 10 tons. Proofrolling shall be performed to densify the areas and to locate soft areas. Soft areas shall be removed, under direction of the Engineer, and replaced with controlled, compacted fill as hereinafter specified.

G. Where, in the opinion of the Engineer, unsuitable subgrade conditions are encountered under pavements, structures, or utilities, a determination will first be made by the Engineer whether the condition is due to the in-situ condition, or is caused by the Contractor’s construction methods.

H. Unsuitable foundation materials, which in the judgment of the Engineer are due to in-situ conditions, shall be excavated when ordered in writing by the Engineer, to the extent directed by the Engineer. All unsuitable material shall be removed to a firm bottom below subgrade elevations. The excavation below subgrade shall be refilled using suitable material as defined in PART 2 - PRODUCTS, and compacted in accordance with Paragraph 3.14 COMPACTED FILLS AND BACKFILLS. Under these conditions, payment for excavation below subgrade and backfill will be made in accordance with Section 01130 MEASUREMENT AND PAYMENT of this Specification.

I. Unsuitable foundation conditions or areas disturbed or rendered unstable, which in the judgment of the Engineer are caused by the Contractor’s construction methods or equipment, shall be corrected by the Contractor to the satisfaction of the Engineer, at no additional expense to the Owner. These corrections shall include the necessary excavations and backfills.

J. Overexcavation: Where excavations for pavements, structures or utilities are made to a depth below the subgrade elevations shown on the Drawings or specified, without authorization, the excess excavation shall be filled, at no additional expense to the Owner to the required level as described above.

K. Subgrade for all pavements, structures, and utility excavations, shall be firm, undisturbed earth/rock except where drainage courses or compacted fills are specified or are required in areas where unsuitable material has been removed.

L. Whenever a condition is encountered where subgrade is at the bottom of a structure and subgrade is part rock and part soil, the rock shall be removed to a depth of 6 inches below subgrade and replaced with suitable material as directed
by the Engineer and as defined in PART 2 -PRODUCTS, and compacted in accordance with Paragraph 3.13 COMPACTED FILLS AND BACKFILLS.

M. Subgrade for trenches shall be as defined in Paragraph 3.11 TRENCH EXCAVATION. Subgrade for structures shall be as defined in Paragraph 3.14 FILLS AND BACKFILLS FOR STRUCTURES. Subgrade for areas to receive topsoil shall be as defined in Paragraph 3.18 TOPSOIL. Subgrade for pavement shall be at the bottom of the pavement cross-section, in accordance with the details shown on the Drawings.

3.05 IN-PLACE UTILITY INSTALLATION

A. An In-Place Utility Installation shall be when a proposed utility – water or sewer - is to be installed in the same location as an existing utility. Prior to the new utility being installed, the Contractor shall first remove and dispose of the existing utility. All existing utilities to be disposed of shall be hauled off-site and disposed of in an approved facility at no additional cost to the Owner or County.

B. For in-place sanitary sewer installation the Contractor shall provide temporary by-pass pumping to pump into another active sewer or to an installed manhole downstream.

1. Prior to beginning by-pass pumping, the receiving manhole and all downstream piping shall be installed, tested and placed into service. The first manhole upstream of the sewer segment to be replaced shall be used as the temporary wet well. The Contractor shall plug the outlet pipe of this manhole to place the downstream pipe out of service.

2. The Contractor shall provide all pumps, hoses, plugs, controls, fuel and personnel necessary for pump operation on a 24-hour a day basis during the construction of the sewer section being by-passed.

3. The by-pass pump shall have a minimum capacity of 1100 gallons per minute (gpm) and shall have suitable suction lift capacity for a manhole 20 feet deep. The hose shall be of sufficient diameter to carry 1100 gpm without creating excessive head. If pumping uphill, the hose shall be supplied with a check valve on the pump discharge to prevent draining back into the manhole.

4. Contractor shall a second pump of the same model available as back-up for the main pump. The back-up pump does not have to be stored on-site but shall be able to be delivered to the site within four (4) hours.

5. Hoses for by-pass pumping may be laid directly on the ground if weather conditions are satisfactory to prevent freezing. Where hoses must cross
roadways protection shall be provided to prevent damage by traffic. The Contractor shall post appropriate signs and supply flaggers for traffic control.

6. The Contractor shall submit to the Owner and Engineer a projected schedule of sanitary sewer Interruptions of Service (IOS) two weeks after the Pre-Construction Meeting. The Owner will initially contact customers to notify them of the future sanitary sewer IOS. The Contractor shall provide the Owner with an up-dated sanitary sewer IOS schedule at each progress meeting. The Contractor shall notify any customers on a sewer segment to be replaced of an IOS a minimum of one (1) week prior to the interruption. The notification shall include the projected date of the interruption and an estimate of the length of the IOS.

3.06 WETLANDS

A. In wetlands areas the Contractor shall remove and stockpile the top 12 inches of native soils and vegetation for reinstallation. Wetland areas are designated on the plans.

B. Care shall be taken during removal and stockpiling to maintain the materials in their natural state. Materials to be reinstalled shall be stockpiled on geotextile material to separate stored material from the substrate. Wetland materials to be reinstalled shall be properly maintained and watered so that healthy, viable plants are reinstalled.

3.07 DEWATERING, DRAINAGE AND PUMPING

A. The Contractor shall provide, continuously operate and maintain all temporary dewatering, drainage and pumping systems required to satisfactorily perform all work under the Contract.

B. Should soil, ground water or local conditions require dewatering systems other than ditches, sumps, and pumps, such systems shall be provided, operated and maintained at no additional expense to the Owner.

C. The Contractor shall exercise every precaution to prevent flotation of any of the work constructed under this Contract, and the Contractor shall be responsible for all damage due to flotation.

D. Such grading shall be done as necessary to prevent surface water from flowing into trenches or other utility excavations, and any water accumulating therein shall be continuously removed and properly filtered to remove sediment.
E. Methods of dewatering excavations shall be at the Contractor's discretion. Continuous investigations and checks shall be made by the Contractor to assure that the dewatering system employed is functioning properly, not causing damage or settlement to adjacent surfaces or structures. Temporary pipes or flumes shall be used to carry surface water across open and/or unstabilized construction areas. The system shall be modified as required and repairs for damage caused by the system shall be the responsibility of the Contractor.

3.08 TEMPORARY EXCAVATION SUPPORT SYSTEM

A. The Contractor shall temporarily support the sides and ends of all excavations, where necessary or where directed by the Engineer, with braces, sheeting, shoring, stringers or other methods of the type, size and quality required. The Contractor will not necessarily be permitted to use any particular type of excavation support system it selects. The Contractor shall be entirely responsible for the design and adequacy of the excavation support system.

B. The temporary excavation support systems shall be removed as backfilling proceeds, in a manner so as not to damage any structures, roadbed, fill or private property. If, in the judgment of the Engineer, removal of temporary excavation support systems will jeopardize any of the work performed under this Contract, or any existing facilities, the Engineer may direct the Contractor to leave all or part of the temporary excavation support systems in place.

C. There will be no extra compensation to the Contractor for use of the required temporary excavation support systems.

D. Pile driving hammers or vibratory hammers shall only be used to drive or extract temporary excavation support systems when approved in writing by the Engineer. However, the Contractor shall be responsible for any damage caused by its operations involving vibrations.

3.09 RESPONSIBILITY FOR CONDITION OF EXCAVATIONS

A. The Contractor shall be entirely responsible for the condition of all excavations made by him, for the entire period of the Contract. All slides, caves or other unacceptable conditions shall be promptly corrected whenever they occur, without extra compensation.

B. The neglect, failure or refusal of the Engineer to order or approve any excavation support system shall not in any way or to any extent relieve the Contractor of any responsibility concerning the conditions of excavations or of any of its obligations under the Contract; nor shall any delay whether caused by an action or want of action on the part of the Contractor or by any action or want of action of the Owner or its agents or employees, or the Engineer, resulting in the keeping of an
excavation open longer than would otherwise have been necessary, relieve the Contractor from the necessity of properly and adequately protecting the excavation from caving or slipping, nor from any of its obligations under the Contract relating to injury of persons or property nor entitle it to any claim for extra compensation.

3.10 PROTECTION OF PROPERTY, STRUCTURES AND UTILITIES

A. The Contractor shall, at its own risk and at no additional expense to the Owner, maintain, support-in-place, and protect all pipes, poles, cables, utilities, walls, buildings, and other structures or property in the vicinity of the work, whether above or below ground, or that may appear in the excavation. The Contractor shall at all times have available on site sufficient quantity of timber, planks, beams, chains, ropes, etc., and shall use them as necessary for supporting any structures and utilities that are uncovered, undermined, endangered, threatened or weakened. The Contractor shall be responsible for all damage, shall take all risks, and shall assume all expense for injury or damage, to any person or property of every kind and description, caused directly or indirectly by the Contractor's work, whether such structures or utilities are or are not shown on the Drawings.

B. In the event that the Contractor damages any existing utility lines report thereof shall be made immediately to the Engineer. If it is determined that repairs are to be made by the Contractor, such repairs will be ordered under the appropriate clause of the VDOT Standard Specifications.

3.11 TRENCH EXCAVATION

A. Subgrade for trenches shall be the bottom of granular bedding, as shown on the Drawings or the VDOT STANDARD DETAILS.

B. Trenches shall be excavated to the necessary widths and depths as may be shown on the Drawings. The maximum clearance between each face of trench and external surface of barrel of pipe or hubs, however, shall not be greater than indicated in the VDOT STANDARD DETAILS or on the Drawings. This maximum width is intended to minimize disruption of existing grades and conditions. All excavation will be unclassified and shall be included in the lump sum or unit price bid for the appropriate bid item. No separate or additional payments will be made for excavation except for removal of unsuitable materials below the subgrade.

C. The sides of the trenches from trench subgrade to an elevation 12 inches above the crown of the pipe shall be practically plumb and under no circumstances will they be permitted to be sloped.
D. No trench length greater than 60 feet at any location shall be left open in advance of the complete pipe placed therein. The Engineer shall be empowered, at any time, to require the backfilling of open trenches over completed pipelines or structures if, in his judgment, such action is necessary. The Contractor shall have no claim for extra compensation even though to accomplish this backfilling it is compelled temporarily to stop excavation or other work at any place. If work is stopped on any trench for any reasons except by order of the Engineer, and the excavation is left open for an unreasonable length of time in advance of construction, the Contractor shall, if so directed, backfill such trench at no additional expense to the Owner, and shall not again open this trench until it is ready to complete the construction therein. If the Contractor shall refuse or fail to backfill such trench completely within 48 hours after said notice, the Engineer shall be authorized to have the work done and the Owner shall charge the expense thereof to the Contractor and retain the same out of any moneys due or to become due it under the Contract.

E. Length of open trench shall be limited to only that length sufficient to advance the trench box or sheeting ahead of the pipe construction operation and to provide a minimum safe working distance between the backfilling operation and the pipe construction operation. No trenches are to be left open at night or weekends. Trenches shall be backfilled or plated in such a manner as to not impede pedestrians or vehicles.

3.12 TRENCH BACKFILL

A. The Contractor shall undercut below trench subgrade, where in the opinion of the Engineer, soft or unstable material is encountered. Remove the unsuitable material to a firm bottom, and replace up to trench subgrade using suitable material compacted as a controlled fill, as described elsewhere, or remove the unsuitable material to the extent directed by the Engineer and replace up to trench subgrade using compacted porous fill No. 57 aggregate. A nonwoven geotextile shall be placed directly onto the soft material prior to placing the No. 57 aggregate, in order to prevent movement of the soft material into the No. 57 aggregate. The geotextile shall wrap around the No. 57 aggregate and overlap for the full trench width. Normal bedding and pipe shall be placed directly onto the refill or geotextile.

B. During backfilling, great care shall be taken not to disturb the pipes by dropping or throwing anything on them from the bank above, or by walking on top or alongside of them.

C. Trench backfill material shall meet the requirements of PART 2 - PRODUCTS.

D. Pipe bedding depth shall be from trench subgrade, from a point below the underside of the pipe barrel, to a point above the underside of the pipe barrel.
Distances from trench subgrade to underside of pipe barrel varies with pipe size and shall correspond with details on the contract drawings. Distance of bedding above pipe barrel varies with pipe size and shall correspond with details on the contract drawings. Pipe bedding material shall be No. 57 or 21A or B stone or sand bedding, as defined in PART 2 - PRODUCTS, and as indicated on the Drawings, and shall be thoroughly compacted by hand operated mechanical tampers before laying the pipe to provide a uniform and continuous bearing and support for the pipe. Bell holes shall be excavated in the bottoms wherever necessary to permit the proper making of joints.

Clay dams shall be installed and compacted within the bedding as shown on the Drawing details, and spaced at intervals no greater than 1000 feet and as directed by the Engineer. The clay dam material shall meet the requirements of PART 2 - PRODUCTS. No measurement or payment will be made but will be considered incidental to the unit price bid per linear foot of pipe in accordance with Section 01130 MEASUREMENT AND PAYMENT of this Specification.

E. Initial backfill, from the top of the pipe bedding to two feet above the crown of the pipe, shall be placed in 6-inch layers and compacted by approved hand-operated mechanical tampers or approved compaction equipment. Initial backfill may include suitable material originating on the job as defined in PART 2 - PRODUCTS. Compaction requirements shall be the same as for bedding.

F. In improved areas, within State and County Rights-of-Way, under paved areas, or where specified in this Section, on the Drawings or in the VDOT Standard Specifications final backfill, from two feet above the crown of the pipe to finish subgrade, shall be placed in 8 inch layers and compacted in accordance with Paragraph 3.14 COMPACTED FILLS AND BACKFILLS, using full trench compaction. Final backfill may include suitable material originating on the job as defined in PART 2 - PRODUCTS.

G. In unimproved areas, final backfill, from two foot above the crown of the pipe to finished subgrade, shall be placed in 8 inch layers and compacted in accordance with Paragraph 3.14 COMPACTED FILLS AND BACKFILLS and in such a manner that a completely dense refill is obtained which is free of voids and not susceptible to settlement. The backfill may include suitable material originating on the site as defined in PART 2 - PRODUCTS. No rock or lump greater than 6 inches in greatest dimension shall be used for trench backfill.

H. All trench backfills for this project shall be placed using full trench compaction, as described above.

3.13 CHANGE OF TRENCH LOCATION
A. In case the Engineer shall direct that the location of a trench be changed from that shown on the Drawings on account of the presence of an obstruction or from other cause, or if changed location shall be authorized upon the Contractor's request, the Contractor shall not be entitled to extra compensation or to a claim for damage provided that the change is made before the excavation is begun. If however, the change in trench location is directed by the Engineer after the excavation has begun but before the trench has been excavated to its ultimate depth, the abandoned portion of the excavation shall be measured and paid at the appropriate stipulated price in the Proposal for the depth actually excavated. If the abandonment is ordered after the trench has been excavated to its ultimate depth, payment will be made, as stated above, to a depth called for on the Drawings or as directed by the Engineer. In both instances, the payment width shall be as indicated on the Drawings or in the STANDARD DETAILS for the size pipe to be installed.

B. If an obstruction occurs within the trench in such manner that the trench has to be excavated to extra width in order that sheeting or bracing may be properly placed, or in order that the structure to be placed in the trench may be properly built, such extra width of trench shall be measured and paid for under the appropriate item in the Proposal. No sloping of sides of excavations, for the purposes of avoiding the necessity of placing sheeting or bracing, either in the presence or absence of obstruction, will be paid for.

3.14 COMPACTED FILLS AND BACKFILLS

A. Prior to placing any fill or backfill, notice shall be given the Engineer so that the work may be inspected, and filling or backfilling shall not proceed without his approval.

B. Placing, spreading and compacting suitable material for fills and backfills:

1. Fill and backfill material shall be placed in approximately horizontal layers which, before compaction, shall not exceed 8 inches in thickness. Fill and backfill material within 5 feet of structures shall be placed in approximately horizontal layers which, before compaction, shall not exceed 6 inches in thickness. Each layer shall be spread uniformly and evenly. All rocks shall be distributed throughout the earth materials and all voids shall be carefully filled and the material properly compacted by rolling, tamping, vibratory compactors, or other methods specified herein and approved by the Engineer. Compaction by heavy rollers or other heavy equipment is prohibited within 5 feet of any structure.

2. Fill/backfill Within State and/or County Road Right of Way (Improved Areas):
a) Moisture content of the fill material shall be within 3% above or below the optimum moisture content for the material while placing and during compaction. After each layer has been placed, mixed and spread evenly, it shall be thoroughly compacted to not less than 95% of maximum dry density for cohesionless soils and not less than 92% of maximum dry density for cohesive soils. Unless otherwise noted, fills and backfills within 12 inches of slab or pavement subgrade shall be compacted to not less than 95% of maximum dry density. Cohesionless soils are defined as granular soils containing less than 15% by weight passing the No. 200 sieve. Optimum moisture content and maximum dry density shall be determined by AASHTO T180. Weaving or creeping of the soil beneath the roller shall be sufficient evidence that the moisture content of the fill or subsoils is excessive, and that required compaction has not been achieved.

3. Fill/backfill Non-Paved Areas (Unimproved Areas):

   a) For the initial fill over the placed pipe, as shown on the contract drawing details, the moisture content of the fill material shall be within 3% above or below the optimum moisture content for the material while placing and during compaction. After each layer has been placed, mixed and spread evenly, it shall be thoroughly compacted to not less than 95% of maximum dry density for cohesionless soils and not less than 92% of maximum dry density for cohesive soils. The final backfill (cohesionless and cohesive material) shall be compacted to not less than 90% of maximum dry density and the moisture content of the fill material shall be within 5% above or below the optimum moisture content for the material while placing and during compaction. Cohesionless soils are defined as granular soils containing less than 15% by weight passing the No. 200 sieve. Optimum moisture content and maximum dry density shall be determined by AASHTO T99. Weaving or creeping of the soil beneath the roller shall be sufficient evidence that the moisture content of the fill or subsoils is excessive, and that required compaction has not been achieved.

4. The fill or backfill shall be constructed in such a manner that the surface will be sloped to drain at all times and shall be sealed by rolling at the completion of each day or prior to rain. No fill or backfill shall be placed, spread or rolled while it is frozen or thawing or be placed upon frozen or thawing ground or during unfavorable weather conditions. Any compacted layer which has been previously frozen shall be reworked or removed before the next layer is placed. Materials containing free water or having a moisture content higher than specified shall not be deposited.
upon the fill or backfill until after they have been dried to the specified moisture content.

3.15 FILLS AND BACKFILLS FOR STRUCTURES

A. Subgrade for structures shall be 6 inches below the underside of the slab, unless otherwise noted.

B. Bedding for structures shall be 6 inches of porous fill No. 57 Aggregate, as defined in PART 2 - PRODUCTS, unless otherwise noted.

C. After completing the construction of structure foundations, footings, walls, etc., below finished grade, all forms shall be removed and the excavation cleaned of all trash and debris. The excavation shall not be used for the disposal of refuse. Any refuse or other foreign materials shall be removed before backfilling. Prior to placing any backfill, notice shall be given the Engineer so that the work may be inspected, and backfilling shall not proceed without its approval. No backfill shall be placed against any structure until 7 days after the concrete forms have been removed.

D. The fill or backfill may include suitable material originating on the job, as defined in PART 2 - PRODUCTS, unless otherwise noted. Compaction shall be in accordance with Paragraph 3.14 COMPACTED FILLS AND BACKFILLS.

3.16 CONTINGENT BORROW MATERIAL

A. In the event that sufficient suitable material is not available from the required excavations on site to perform the work as specified on the Drawings or in the VDOT Standard Specifications, suitable borrow material shall be furnished by the Contractor from approved off-site sources.

3.17 CONTINGENT BORROW, AGGREGATE, POROUS FILL AND TOPSOIL

A. The Engineer may direct the use of any additional quantity of borrow, aggregate, porous fill, or topsoil, as specified in PART 2 - PRODUCTS, to be used below subgrade or at locations other than as specified on the Drawings or in the VDOT Standard Specifications.

B. Placement and compaction of these materials shall be in accordance with Paragraph 3.14 - Compacted Fills and Backfills.

3.18 TOPSOIL

A. Upon completion of grading, all debris shall be cleaned up and removed from the premises.
B. Subgrade shall be the surface upon which the topsoil is placed, defined as follows: For all non-paved disturbed areas of the site, place a 4-inch depth of topsoil on areas to be seeded, and place a 2-inch depth of topsoil on areas to be sodded, as noted on the Drawings, or specified.

C. Fine grading and placement of salvaged or furnished topsoil shall conform to Section 602 of the VDOT Standard Specifications.

3.19 SEEDING AND MULCHING

A. All non-paved disturbed areas shall be seeded and mulched, unless otherwise noted on the Drawings or specified. Seeding and mulching shall conform to Section 603 of the VDOT Standard Specifications.

3.20 STREAM CROSSINGS

A. Stream crossings shall meet the requirements of the Virginia Erosion and Sediment Control Handbook and the Joint Permit.

1. Above-water or aerial utility crossings shall not be allowed.

2. Underwater Crossings: A minimum cover of 3 feet shall be provided over the pipe with appropriate stream protection. Restrained joints and concrete encasement shall be required the full length of the crossing as shown on the plans.

B. All underwater stream crossings shall be as shown on the Drawings for the individual crossing.

C. All underwater stream crossings shall be in accordance with the Erosion and Sediment Control Details, shown on the Drawings, and shall be in accordance with the Virginia Erosion and Sediment Control Handbook and the Joint Permit.

D. No underwater stream crossing shall be conducted during the prohibited times of year indicated in the Erosion and Sediment Control Notes, shown on the Drawings or in the Joint Permit.

E. Temporary cofferdam structures shall be “Port-a-Dam”, or approved equal, and methods and materials shall be in accordance with Paragraph 1.04 Submittals.

F. Riprap Slope and Channel Protection

1. Subgrade preparation and placement of riprap for the protection of stream slopes and banks shall be as described in this Section, as shown on the
Drawings, and shall conform to the requirements of Section 414 of the VDOT Standard Specifications and the Joint Permit.

2. Placement of riprap shall be by excavator bucket and by hand, to provide a dense, interlocking layer. Free-fall dumping shall not be allowed. The surface shall be graded trimly and evenly to the lines and grades shown on the Drawings, using blades and heavy tracked equipment.

3.21 ROAD CROSSINGS

A. Unless otherwise provided for by agreement with VDOT or owner of the road, roads shall be crossed by open cutting of the road. The Work shall be done by direct burial of the pipe in accordance with the above Specifications and the Drawings.

END OF SECTION
SECTION 02223

VIBRATION CONTROL

PART 1 - GENERAL

1.01 DESCRIPTION

A. This work shall consist of the Contractor employing the services of a Vibration Control Consultant for use in monitoring rock excavation using explosives, or using mechanical or chemical methods, pile driving, excavation support system installation, and all other construction activities involving vibrations. Work under this item includes performing a pre- and post-construction survey, and monitoring and recording the vibrations due to construction operations. The Contractor shall submit to the Engineer a detailed description of the means, methods, equipment and materials used, and methods for controlling vibration by limiting ground motion and airblast.

B. The Contractor shall be responsible for reading the geotechnical data, located in Appendix D of these Specifications, and shall become familiar with the site and the subsurface conditions, as required in Section 02200 - Earthwork, Excavation, Trenching and Backfilling. Ignorance of conditions will not be accepted as a basis of claim for additional compensation. The Owner and Engineer do not warrant or guarantee that the conditions actually encountered in the execution of the work under this contract will be the same as the conditions indicated in the geotechnical data.

C. Vibration control requirements specified in this Section shall be incidental to the Proposal. The cost of rock excavation shall be as described in Section 02200 - Earthwork, Excavation, Trenching and Backfilling.

1.02 RELATED WORK INCLUDED ELSEWHERE

A. Section 02200 - Earthwork, Excavation, Trenching, and Backfilling

1.03 SUBMITTALS

Submittals to the Engineer, and compliance by the Contractor with provisions for protection of life and property, shall not relieve the Contractor of the responsibility or liability for the safety of persons and property. The Contractor's submittals to the Engineer shall not constitute nor shall they be construed to be a guarantee by the Engineer that the desired results will be achieved. Submittals to the Engineer shall not relieve the Contractor from the responsibility of complying with the requirements of these specifications. The Contractor shall submit the following in accordance with the Proposal:
A. Contractor Submittals

A Conceptual Construction Plan shall be submitted describing the proposed general concept for construction activities and the Contractor’s proposed efforts regarding the safety of structures and utilities. Refer to Section 1300 – Submittals.

B. Vibration Control Consultant Submittals

1. Vibration Control Consultant Documentation

The Contractor shall employ the services of an independent consultant, specializing in the field of monitoring vibrations as a result of construction activities, and their effects on structures and utilities. The Vibration Control Consultant shall submit to the Engineer for approval, documentation of at least five (5) years of experience, evidence of the satisfactory completion of at least five (5) monitoring programs or operations comparable in scope to this work, and three (3) examples of pre- and post-construction survey reports.

2. Pre- and Post-Construction Plan and Surveys

A Survey Plan shall be submitted by the approved Vibration Control Consultant, describing the locations of proposed pre- and post-construction surveys to be performed at each potentially affected property, structure, or utility, and shall provide for two (2) additional locations, as may be specified by the Engineer. The surveys shall be conducted and documented as described herein, and in accordance with the requirements of regulatory authority, and shall be considered as those on record. The pre-construction survey shall be performed in the presence of the respective owner of each structure or utility, or his duly authorized representative. The Engineer may accompany the Consultant during the survey.

The existing structures and utilities shown on the Drawings are for the Contractor’s information only. The Contractor shall verify the existence and exact location of all structures and utilities in the vicinity of work involving vibrations, which the Consultant deems necessary. The Contractor’s attention is directed to the following specific structures or utilities for consideration, which are located in the project vicinity and are shown on the Drawings:

a. None

Pre-construction surveys shall be performed by the Consultant to determine the condition of any property or structure, and to document any pre-existing
defects, cracks, or irregularities. The contents of structures shall also be identified and their condition documented. Each property or structure surveyed shall have a separate bound survey report and shall include identification of the property or structure, owner, date and time of survey, and shall accurately relate all photographs, digital records, measurements and sketches to the body of the report. A commercial photographer, approved by the Engineer, shall provide color eight-inch by ten-inch (8” x 10”) photographs. Three (3) copies of each survey report shall be furnished to the Engineer 30 days prior to any construction operations. The Contractor, the Vibration Control Consultant and the photographer shall furnish a notarized statement, to the Engineer, certifying the date(s) of the pre-construction survey. This certification shall include a statement that the pre-construction survey was made in the presence of and to the satisfaction of each respective structure or utility owner. Should the property or structure owner disagree with any item of the report, provisions shall be made so that such a disagreement is documented and distributed to all parties involved.

Post-construction surveys shall be performed by the Consultant upon completion of all operations involving vibrations, at the same locations as the pre-construction surveys. The Consultant shall re-examine the condition of structures, and document all defects, cracks or irregularities noted in the pre-construction survey. Additionally, any defects, cracks or irregularities not noted in the pre-construction survey shall be documented. Each property or structure surveyed shall have a separate bound survey report, independent of the pre-construction survey report. Each report shall include identification of the property or structure, owner, date and time of survey, shall accurately relate all photographs and tape records to the body of the report, and shall include documentation and photographs of any damage and a comparison to the pre-construction survey. Three (3) copies of each post-construction survey report shall be furnished to the Engineer.

3. Vibration Monitoring Instrument Specifications

The Vibration Control Consultant shall submit to the Engineer for approval, manufacturer's specifications describing instrument characteristics of all ground motion monitoring instruments to be used.

4. Vibration Monitoring Plan

The Vibration Control Consultant shall submit a Vibration Monitoring Plan, describing the locations of each instrument and methods of monitoring. In addition to the location(s) described on the Vibration Monitoring Plan, the Consultant shall include provisions for up to two (2) additional instruments located at monitoring sites as specified by the Engineer.
5. **Vibration Monitoring Records**

The Vibration Control Consultant shall submit to the Engineer daily monitoring records as described herein.

6. **Certification of Calibration**

The Vibration Control Consultant shall submit to the Engineer for approval a current certification of calibration, traceable to the National Bureau of Standards, for all seismic instruments, indicating dynamic shake-table calibration by a competent vibration testing facility.

### C. **Blasting Contractor Submittals**

1. **Blasting Contractor Documentation**

Blasting Contractor Documentation shall be submitted to the Engineer for approval documenting that the Blasting Contractor has at least five (5) years of experience and evidence of the satisfactory completion of at least five (5) blasting programs or operations comparable in scope to this work. The Blasting Contractor shall submit documentation of licensing required by County, State, Federal or other regulatory authorities having jurisdiction. The Blasting Contractor shall apply for and obtain all required blasting permits, and shall submit documentation to the Engineer.

2. **Blasting Schedule**

A Blasting Schedule shall be developed by the Blasting Contractor detailing the date, time and location of proposed blasts. The Blasting Schedule shall be published in a local newspaper and submitted to the Engineer for information and record purposes at least ten days, but not more than 20 days, before the start of the blasting program. Should a change occur to the schedule, it shall be re-published and re-distributed. The Blasting Contractor shall also provide a Blasting Schedule to any public utilities, private residence, or others possibly affected. Blasting operations shall be restricted to between the hours of 8:00 a.m. and 5:00 p.m., Monday through Friday. Any variation to this restriction must be approved in writing by the Engineer.

3. **Conceptual Blasting Plan**

A Conceptual Blasting Plan shall be submitted by the Blasting Contractor to the Engineer for information and record purposes, and shall include the following:
a. A complete summary of proposed transportation, handling, storage, and use of explosives, and shall include the names of personnel who will supervise blasting operations, written evidence of past experience and competency, and a minimum of three (3) references for each such person.

b. The proposed general concept for the blasting, including individual blasthole and delay patterns and loading diagrams to cover each type of shot anticipated, controlled blasting techniques, and controls of noise, dust, fly rock, airblast, and vibrations.

c. Data necessary to support the adequacy of the Blasting Contractor's proposed efforts regarding the safety of structures and slopes and to assure that an adequate foundation is obtained.

d. Information on test blasts planned by the Blasting Contractor.

e. Individual shot plans shall be submitted on a day-to-day basis for information and record purposes. Individual shot plans shall include drilling patterns; number, spacing, location, inclination, diameter, and depth of drilled holes; amount, type, diameter, and distribution of explosive per hole; pounds of explosives per lineal foot for controlled perimeter holes; powder factor; delay patterns, type of initiators, time of each delay, and pounds of explosive for each delay; time of blast; and total pounds of explosives in place at any one time within the area to be excavated under this Contract.

D. Other Data

The Contractor shall also submit any other data which the Engineer may deem pertinent to the Engineer's determination of the Contractor's intent and purpose to produce smooth and sound rock surfaces at the lines of excavation, and to protect the safety of persons and adjacent structures and facilities.

1.04 VIBRATION CONTROL MEETING

The Engineer will review the required submittals for conformance with the Contract Drawings and Specifications. Within 30 days after receipt of the submittals, the Engineer will notify the Contractor of any additional information required and/or changes necessary to meet the contract requirements. Any parts of the submittals that are unacceptable will be rejected and the Contractor shall resubmit changes for re-evaluation. All procedural approvals given by the Engineer shall be subject to trial in the field and shall not relieve the Contractor of the responsibility to satisfactorily complete the work in this specification. Prior to construction, the Contractor shall arrange a vibration control meeting with the Engineer to discuss rock excavation procedures for this project.

PART 2 - PRODUCTS
2.01 EXPLOSIVES

A. Pre-packaged explosives only shall be used in blasting. Free flowing ANFO (ammonium nitrate and fuel oil) shall not be permitted.

B. No electrical-type blasting system shall be used within 500 feet of energized electrical lines or equipment.

2.02 BACKFILL

Materials furnished as suitable material for backfill in place of excavated rock shall be as specified in Section 02200 - Earthwork, Excavation, Trenching and Backfilling.

PART 3 - EXECUTION

3.01 VIBRATION MONITORING

A. Where construction activity involving vibration is performed, vibration monitoring shall be required. The Contractor shall employ a Vibration Control Consultant to monitor and analyze results from seismographic recordings and to provide advice in order to eliminate the occurrence of damage due to construction operations. Initial tests of construction activity shall be monitored under the supervision of the vibration consultant who will determine the maximum vibration limitations and maintain the vibration effects at or below the limitation levels at existing structures or utilities.

B. After completion of the tests, the Vibration Control Consultant shall monitor and record ground motion caused by all subsequent vibration, and provide the Engineer with daily monitoring records. Should data indicate that limiting levels have been exceeded; the Contractor shall take necessary measures to reduce vibrations to acceptable levels. Should conditions warrant, the Engineer reserves the right, at any time, to require the Contractor to submit a revised Plan to reduce the vibrations. Nothing presented in these specifications shall in any way relieve the Contractor of any responsibility for any and all damage to existing structures, utilities, or the work. Any damage incurred as a result of the Contractor’s construction operations shall be repaired by the Contractor at his sole cost to the complete satisfaction of the property owner and Engineer.

C. The Vibration Control Consultant's monitoring instruments shall be located immediately adjacent to the nearest structure(s) and at other locations as designated on the approved Monitoring Plan. The record shall consist of the seismographic records identified by instrument number, location of each instrument, date, time and location of vibration origin, and all other data necessary to control the operations.
These records, as a formal report, shall be submitted to the Engineer on a weekly basis and provided in tabulated form at all other times.

3.02 GROUND MOTION MONITORING

A. The seismographs shall be capable of providing a permanent record of the three components of ground motion in terms of "particle velocity", with velocity transducers having a flat response over a range of at least 6 to 200 Hertz, and in addition shall be capable of internal dynamic calibration.

B. Peak Particle Velocity shall be the measure of the level of ground vibration and is defined as the maximum of any one of the three mutually perpendicular components of motion. Vibrations shall be limited such that the maximum peak particle velocity as measured shall not exceed the recommendation of the Vibration Control Consultant, as approved by the Engineer, and shall be related to Paragraph 3.09 U.S. BUREAU OF MINES CRITERIA.

3.03 AIRBLAST MONITORING

A. The airblast monitoring instrument shall be capable of recording full waveform time histories and in addition shall be capable of internal dynamic calibration.

B. A constant recording instrument shall be used and shall be located at the nearest structure to the blast, preferably adjacent to the seismograph. All instruments used for airblast monitoring shall be equipped with windscreens over the microphones, which shall be placed in an area not masked by trees or buildings, at least 5 feet to the side of any structure, and 3 to 5 feet above the ground.

C. Airblast, as recorded at the closest structure, shall be limited to a maximum value of 110 dB peak when measured by an instrument having a flat response over a range of at least 6 to 200 Hertz. The Engineer may authorize an airblast value of 130 dB where, in the Engineer's judgment, maintaining 110 dB is not practical.

3.04 ROCK EXCAVATION

A. Where encountered, the Contractor shall excavate rock (as defined below), to the lines and grades indicated on the Drawings or as directed by the Engineer, and shall dispose of the excess and unsuitable excavated material and furnish suitable material for backfill in place of the excavated rock, as described in Section 02200 - Earthwork, Excavation, Trenching and Backfilling.

B. The word “rock” wherever used as the name of an excavated material or material to be excavated, shall mean only boulders and pieces of concrete or masonry exceeding ½ cubic yards in volume, solid ledge rock, or bedrock which, in the opinion of the Engineer, requires for its removal, drilling and blasting, wedging, sledging, barring,
or breaking up with a power-operated tool. No soft, weathered, decomposed or
disintegrated rock which can be removed with a hand pick or power-operated
excavator or shovel, no loose, shaken, or previously blasted rock or broken stone and
no rock beyond the maximum limits of excavation, which may fall into the
evacuation, will be considered as “rock”.

C. Rock excavation methods employing the use of explosives, or employing mechanical
or chemical methods other than the use of explosives, shall be submitted to the
Engineer for approval. Regardless of the methods for rock excavation, the
Contractor shall conform to the requirements for vibration control. The Contractor is
responsible for operating in a safe manner, for producing smooth and sound rock
surfaces at the lines of excavation, and for controlling damage and vibration.

3.05 EXCESS ROCK EXCAVATION

A. Rock, below normal subgrade, which is shattered due to drilling and blasting, shall
be removed. Any and all excess rock excavation, whether resulting from over-
breakage or other causes, which is below the normal elevation of subgrade shall be
backfilled in pipe trenches and under pavements as for “Overexcavation” as
described in Section 02200 - Earthwork, Excavation, Trenching and Backfilling, and
shall be backfilled for structures using concrete, at the Contractor’s expense.

B. If rock is excavated within a pipe trench beyond the limits of payment, the excess
rock excavation, whether resulting from over-breakage or other causes shall be
backfilled in accordance with Section 02200 – Earthwork, Excavation, Trenching,
and Backfilling.

3.06 DISPOSAL OF EXCAVATED ROCK

A. The Contractor shall stockpile sufficient quantities of the excavated rock material for
use in controlled fills and backfills, or for use as riprap, as may be described in
Section 02200 - Earthwork, Excavation, Trenching and Backfilling.

B. Excavated rock material shall not be used in backfilling trenches, except as described
in Section 02200 - Earthwork, Excavation, Trenching and Backfilling.

C. All excess or unsuitable excavated rock material shall be disposed of by the
Contractor as described in Section 02200 - Earthwork, Excavation, Trenching and
Backfilling at the contractor’s expense.

3.07 EXPLOSIVES

The Contractor shall keep explosives on the site only in such quantity as may be needed for
the work under way and only during such time as they are being used. No on-site overnight
storage of explosives shall be permitted. The Engineer shall be notified in advance of daily
storage and use of explosives. Explosives shall be stored in a secure manner and away from all tools. Caps of detonators shall be safely stored at least 100 feet from the explosives when not secured in approved containers on approved vehicles during daily blasting operations. Upon completion of daily construction, all explosives and appurtenances remaining on site shall be promptly removed from the premises. In addition to observing all County ordinances and State and Federal laws relating to the transportation, storage, handling and use of explosives, the Contractor shall conform to any further regulations which the Engineer may deem necessary. Should any of the above mentioned laws, ordinances, or regulations require a licensed blaster to perform or supervise the work, said blaster shall, at all times, have his license on-site and shall permit examination thereof by the Engineer or other regulatory authorities having jurisdiction.

3.08 BLASTING CONTROL

A. The Engineer reserves the right to observe the drilling and loading of shot holes for test blasting and any excavation blasting to verify that they are in accordance with the submitted plans. The Contractor shall inform the Engineer with ample notice before the start of these operations.

B. The Contractor shall at all times be responsible for any damage caused by vibrations or fly rock due to blasting or any of his other operations.

C. All blasts shall be designed to prevent flyrock. It shall be the Contractor’s responsibility to ensure that no hazards exist to people or structures in the area. Blasting mats shall be used at all times.

D. Blasting shall be performed only with such quantities and strengths of explosives and in such manner as will break the rock approximately to the lines and grades shown leaving the rock not to be excavated in an unshattered condition. Controlled blasting techniques shall be used for all perimeter surfaces when blasting to final grades or lines. Controlled blasting is excavation of rock in which the various elements of the blast (hole size, depth, spacing, burden, charge size, explosive charge weight per delay, distribution, delay sequence) are carefully balanced and controlled to provide a distribution of charge that will excavate the rock to the required contours to minimize overbreak and fracturing of the rock beyond the contour line. Smooth wall blasting, pre-splitting, cushion blasting and line drill are examples of operations included in the term “controlled blasting”. Where the nature of the rock is such that excessive overbreak beyond these limits may occur, the Engineer may require that no blasting be done and that mechanical means be used for rock excavation.

E. All necessary precautions shall be taken to preserve the material below and beyond the established lines of all excavation in the soundest possible condition. The Contractor is responsible for taking proper account of the geology and formation competency to prevent damage to foundation or perimeter rock, or structures resulting from permanent blast-induced rock movements or blast-induced gas...
pressures. The Engineer will inspect an excavation following the blast and cleanup to determine acceptability.

The Engineer may require a change in the controlled blasting technique, perimeter hole spacing, and/or loading density if unsatisfactory results are obtained.

F. Where concrete is to be placed directly upon or against rock surfaces, the excavation shall be sufficient at all points to provide for minimum dimensions of concrete shown on the Drawings, and the required minimum dimensions of concrete shall be exceeded as little as possible.

G. The Contractor shall only employ competent personnel qualified by training and experience to blast, particularly in potentially high damage areas near any above and below ground structures, underground vaults, manholes, roadways and utilities. The Contractor shall maintain close supervision of the blasting personnel and ensure that the blasting operations comply with all Federal, State, and County authority blasting regulations, explosive manufacturer’s instructions and the requirements of the vibration limitations.

H. Blasting shall not be performed closer than 10 feet to existing water, gas, sewer or conduit utilities unless such facilities have been completely exposed, definitely located, and then backfilled prior to the blast. In any case, blasting shall be no closer than 2 feet from definitely located existing utilities, 10-inch or smaller diameter and no closer than 5 feet from utilities larger than 10-inch diameter.
3.09 U.S. BUREAU OF MINES CRITERIA


END OF SECTION
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SECTION 02230

SITE CLEARING

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes: Requirements for clearing of all areas within the Contract limits and other areas shown, including work designated in permits and other agreements.

B. Related Work Specified in Other Sections Includes:

1. Section 02220 – Earthwork, Excavation, Trenching and Backfilling

1.02 DEFINITIONS

A. Clearing: Clearing is the removal from the ground surface and disposal, within the designated areas, of trees, brush, shrubs, down timber, decayed wood, other vegetation, rubbish and debris as well as the removal of fences.

B. Grubbing: Grubbing is the removal and disposal of all stumps, buried logs, roots larger than 2 inches, matted roots and organic materials.

PART 2 - MATERIALS (Not Used)

PART 3 - EXECUTION

3.01 TREE REMOVAL

A. Tree Removal Within Property Limits: Remove trees and shrubs within the demolition and easement limits indicated.

1. Remove trees and shrubs to avoid damage to trees and shrubs designated to remain.

2. Grub and remove tree stumps and shrubs felled within the demolition limits to an authorized disposal site. Fill depressions created by such removal with material suitable for backfill.

3. Tree Removal Outside Property Limits: Do not cut or damage trees outside the demolition limits unless shown to be removed or unless written
permission has been obtained from the property owner. Furnish three copies of the written permission before removal operations commence.

3.02 TREES AND SHRUBS TO BE SAVED

A. Protection: Protect trees and shrubs that are so delineated or are marked in the field to be saved from defacement, injury and destruction.

1. Work within the limits of the tree drip line with extreme care using either hand tools or equipment that will not cause damage to trees.
   a. Do not disturb or cut roots unnecessarily. Do not cut roots 2 inches and larger unless approved.
   b. Immediately backfill around tree roots after completion of construction in the vicinity of trees.
   c. Do not operate any wheeled or tracked equipment within drip line.

2. Protect vegetation from damage caused by emissions from engine-powered equipment.

3. During working operations, protect the trunk, foliage and root system of all trees to be saved with boards or other guards placed as shown and as required to prevent damage, injury and defacement.
   a. Do not pile excavated materials within the drip line or adjacent to the trunk of trees.
   b. Do not allow runoff to accumulate around trunk of trees.
   c. Do not fasten or attach ropes, cables, or guy wires to trees without permission. When such permission is granted, protect the tree before making fastening or attachments by providing burlap wrapping and softwood cleats.
   d. The use of axes or climbing spurs for trimming will not be permitted.
   e. Provide climbing ropes during trimming.

4. Remove shrubs to be saved, taking a sufficient earth ball with the roots to maintain the shrub.
   a. Temporarily replant if required, and replace at the completion of construction in a condition equaling that which existed prior to removal.
   b. Replace in kind if the transplant fails. Provide transplanting, planting, and watering and guarantee as specified in Section 02930 – Seeding and Sodding.
5. Have any tree and shrub repair performed by a tree surgeon properly licensed in the State of Virginia within 24 hours after damage occurred.

3.03 CLEARING AND GRUBBING

A. Clearing: Clear all items specified to the limits shown and remove cleared and grubbed materials from the site.

1. Do not start earthwork operations in areas where clearing and grubbing is not complete, except that stumps and large roots may be removed concurrent with excavation.

2. Comply with erosion, sediment control and storm management measures.

B. Grubbing: Clear and grub areas to be excavated, areas receiving less than 3 feet of fill and areas upon which structures are to be constructed.

1. Remove stumps and root mats in these areas to a depth of not less than 1 foot below the subgrade of sloped surfaces.

2. Fill all depressions made by the removal of stumps or roots with material suitable for backfill.

C. Limited Clearing: Clear areas receiving more than 3 feet of fill by cutting trees and shrubs as close as practical to the existing ground. Grubbing will not be required.

D. Burning: Burning within the limits of Spotsylvania County shall not be allowed.

3.04 TOPSOIL

A. Stripping: Strip existing topsoil from areas that will be excavated or graded prior to commencement of excavating or grading and place in well-drained stockpiles in approved locations.

END OF SECTION
SECTION 02555

PUMP STATION DEMOLITION

PART I - GENERAL

1.01 SUMMARY OF WORK

A. This section outlines the general requirements to:

1. Demolish and dispose of one (1) existing wastewater pumping station (WWPS) consisting of, but not limited to: emptying and cleaning of the wet well; filling of the wet well, influent manhole, meter manhole with concrete; abandonment of the existing influent gravity sewer; and abandonment of the existing force main. Spotsylvania County will be responsible for the removal of the existing pumps and motors and all electrical equipment and components unless otherwise specified in this section.

B. The Contractor shall provide all equipment, labor, permits, materials, incidentals and technical skill to perform all items of work specified herein or by reference.

C. WWPS No. 1 (PS 20) is located at the end of Enchanted Woods Way in Spotsylvania County, VA apart of Phase 4A of the project. The location is shown on Sheet 8 of the contract drawings.

D. Contractor shall maintain operation of existing WWPS No. 1 (PS 20) until Manholes 18A and 21A and associated piping are installed, tested and placed into service. WWPS No. 1 (PS 20) shall then be decommissioned in accordance with these specifications and as directed by the County.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 01300 - Submittals

B. Section 01560 - Erosion and Sediment Control

C. Section 02200 - Earthwork, Excavation, Trenching and Backfilling

1.03 REFERENCES AND STANDARDS

A. Spotsylvania County, Department of Public Utilities Standards.

B. Virginia Department of Health, Waterworks Regulations in its entirety.

C. Codes, Specifications and Standards:
Codes, specifications, and standards referred to by number or title shall form a part of this specification to the extent required by the reference thereto. Latest revisions shall apply, unless otherwise shown or specified.

1. American National Standards Institute (ANSI) and American Water Works Association (AWWA) Standards.
4. Underwriters Laboratory, Inc. (UL).
5. National Sanitation Foundation (NSF).

1.04 SUBMITTALS

A. Submit detailed schedule of work for these activities.
B. Notification of date to start work on site.
C. Submit qualification of Contractor and individuals performing the demolition work.
D. All documentation and submittals required for lead based paint removal and the demolition of lead based paint coated materials.

1.05 PERMITS/APPROVALS

A. Comply with applicable requirements of Spotsylvania County, the Virginia Department of Health, the Virginia Department of Environmental Quality and other local, state and federal agencies having jurisdiction.

1.06 SITE AND FACILITY DESCRIPTION

A. The WWPS is a suction lift pumping station consisting of an inlet manhole, wet well, valve vault, meter manhole and emergency by-pass connection. A standby emergency generator is located on the site. The transfer switches and electrical controls are mounted on a separate electrical service panel. The site is surrounded by six foot (6’-0”) high chain link fence. The Enchanted Woods Way pumping
station is supplied by 12” and 8” diameter gravity sewers and discharges through an 8-inch diameter force main.

B. The property adjoins the Massaponax Creek drainage basin. The Contractor shall make every effort to avoid any contamination to the creek or its tributaries including silt, chemicals, oil or lubricants and any other construction byproducts.

C. Existing utilities and buried structures are shown in an approximate location. The Contractor shall field verify the location by digging test pits and using utility locator services as necessary.

D. The Contractor shall familiarize himself with the site, site utilities, concrete slab work and contents of all facilities prior to bid.

1.07 FACILITIES TO REMAIN IN SERVICE

A. The WWPS will be replaced by a 24-inch diameter gravity sewer and will discharge into Phase 3 of the Massaponax Interceptor Sewer. The pump station, backup generator, existing influent sewers and force main must be kept in operation at all times until the completion of the 24-inch diameter gravity sewer.

1.08 SCHEDULE AND NOTIFICATION

A. The Contractor shall notify the Owner in writing, 14 days in advance, advising the Owner as to the date they wish to gain access to the site to begin demolition.

B. Extensive coordination with the Owner will be required on this project.

C. Refer to additional requirements in Section 01106 - Construction Scheduling, Coordination and Sequencing.

1.09 OBLIGATIONS OF THE OWNER

A. To prepare the site and facility for demolition, the Owner shall:

1. Secure and remove the suction lift pumps and motors.

2. Remove the motor control center, starters and float controls.

3. Remove the emergency generator and switchgear from the electrical panel.

4. Haul off the fuel oil tank. (Contractor to excavate and remove the tank and then leave for County to pickup).

5. Have the local power company disconnect the power service at the nearest pole or offsite connection point.
6. Have the local telephone company disconnect the telephone service at the nearest pole or offsite connection point

7. Advise the Contractor when the site is ready for access.

8. Provide access to the site by unlocking all gates, doors, etc.

1.10 QUALIFICATIONS OF CONTRACTOR

A. The Contractor (or Subcontractor) engaged in demolishing the WWPS shall have 5 years of experience engaged in this activity. The Contractor shall provide documentation of at least three projects of similar size within Virginia.

PART II - PRODUCTS (Not Used)

PART III - EXECUTION

3.01 GENERAL

A. Demolition of the WWPS as discussed in Sections 1.01 and 1.06 above or as indicated on the drawings, shall include all contents of the structures, adjoining piping, structures and tankage.

Contractor’s effort shall include but not be limited to the following:

1. Pump out wet well into the Massaponax Interceptor Sewer. Sludge and waste shall be trucked to the Massaponax Wastewater Treatment Plant for disposal.

2. All structures, concrete slabs and footers shall be removed to a depth of 2 feet below grade (unless indicated deeper on the drawings or herein), all piping within the meter manhole and wet well, valves, gauges, controls, all electrical panels, all exposed electrical conduit and wiring within the meter manhole and wet well shall be removed.

3. All buried piping beneath and exterior to the meter manhole and wet well within a distance of 4 feet from the outside face of the structures shall be removed. Contractor shall plug with grout all open ends of pipes abandoned below grade.

4. All buried electrical conduits beneath and exterior to the meter manhole and wet well and within a distance of 8 feet of the structures shall be removed. Plug all open ends of electrical conduits abandoned below grade.
5. Concrete spoil may be allowed to fill the remaining structures below grade. All exposed or protruding rebar shall be cut off flush to the concrete. The remaining structure shall be filled to grade with clean sand, select fill or flowable fill.

6. No structural steel will be used as fill material anywhere on the project including within demolished concrete structures.

7. All below ground structures capable of containing or capturing rain or ground water shall have a 30 inch diameter hole punched in the bottom of the structure to allow water to escape. The punched hole will be filled with open graded coarse aggregate or 3/8 inch pea gravel. Lay a four foot square layer of geotextile fabric over the gravel then backfill with clean sand fill.

8. Remove and dispose of 6’-0” chain link fencing and fence components and concrete post foundations. Backfill post holes with clean sand or select fill.

B. Site Restoration

1. Contractor shall remove all trash and debris, final grade the site to the nearest drainage way, and fertilize, seed, and mulch the site in accordance with the site restoration section of the specifications.

3.02 SALVAGING VERSUS DISPOSAL OF MATERIALS

A. Contractor’s price shall be based on salvaging or disposing of all components at an approved landfill or disposal site.

END OF SECTION
SECTION 02615

DUCTILE IRON PIPE AND FITTINGS

PART 1 - GENERAL

1.01 DESCRIPTION

A. This Section covers the requirements for furnishing all labor, materials, equipment and appurtenances necessary for the complete and satisfactory construction of all ductile iron exterior piping and fittings shown on the Drawings and as specified herein.

B. All work, materials and incidentals necessary to the construction of the piping, including excavation and refill, excavation support, laying and joining of pipe, and other miscellaneous work shall meet the requirements of Spotsylvania County, Department of Utilities Standards and to the applicable requirements of other Sections and as modified herein.

C. The CONTRACTOR shall verify all dimensions of valves, special fittings, pipe, equipment, etc., so that all of the pipe work performed will fit together properly and will conform to the arrangement as shown on the Drawings. In selecting laying lengths of fittings, the CONTRACTOR shall be guided by the dimensions of fittings and existing pipe systems to which connections are made and by the indicated dimensions on the Drawings. All pipe and specials shall be accurate to the dimensions shown. Bells, spigots, and flanges shall be at right angles to the axis of the opening, and openings shall be at the exact angle specified.

D. The CONTRACTOR shall verify the type of pipe, the joint type, configuration and direction of bell and spigot and the exact horizontal and vertical location for connections at the locations indicated on the Drawings, finalize all lay lengths, and confirm pipe layout prior to shop drawings submittal. Any deviation from the connection concept indicated which prevents construction as shown shall be brought to the ENGINEER’s attention for resolution prior to shop drawing preparation. The CONTRACTOR shall provide the pipe material to match the existing pipe and/or provide the required adapters to connect to the existing pipe.

1.02 RELATED SECTIONS

A. Section 02200 – Earthwork, Excavation, Trenching and Backfilling
B. Section 02223 – Vibration Control
C. Section 02625 – Polyvinylchloride Pipe and Fittings

1.03 SHOP DRAWINGS
A. The CONTRACTOR shall submit shop drawings for all piping systems. The shop drawing submittals shall include all design computations and computer printouts of computations. Detailed dimensioned drawings shall be submitted and approved by the ENGINEER prior to any pipe fabrication. Design calculations and detailed fabrication drawings shall be submitted for all fabricated fittings. Manufacturers' data and/or materials lists shall be submitted for standard fittings, inlets, materials and standard pipe sections in sufficient detail to show compliance with all requirements of the Specifications. Certificates shall be submitted as required by AWWA standards for pipeline and fittings including factory applied linings and joint material; cast iron frames covers and grates, and precast structure sections.

B. CONTRACTOR shall coordinate and furnish submittals in accordance with Section 01300.

C. CONTRACTOR shall submit certifications by the manufacturer indicating compliance with the specified requirements.

1.04 EXISTING UTILITIES

A. Existing utilities have been indicated on the Drawings in accordance with the best information available for the information of the CONTRACTOR. The OWNER expressly disclaims any responsibility for accuracy or completeness of information shown. The locations of existing utilities shall be determined by the CONTRACTOR and any deviations from the information shown on the Drawings shall be brought to the ENGINEER’s attention for resolution of any conflicts which prevent the construction as shown on the Drawings. Existing utilities and services shall be carefully protected; any damage to utilities caused by the work shall be immediately repaired by the CONTRACTOR to the satisfaction of the OWNER, using materials of the kinds damaged. No additional compensation will be allowed for such repair work.

B. The CONTRACTOR shall bear the entire cost of any and all monetary penalties which may be assessed by utilities whose facilities are damaged and/or put out of service by the CONTRACTOR during the prosecution of the work under this Contract.

C. The CONTRACTOR shall notify Miss Utility 48 hours on advance of digging.

1.05 DELIVERY, STORAGE AND HANDLING

A. Delivery and Storage

1. Piping - Inspect materials delivered to site for damage; store with minimum of handling. Store piping, jointing materials and rubber gaskets under cover.
Do not store materials directly on the ground. Keep inside of pipes and fittings free of dirt and debris.

2. Metal Items - Check upon arrival; identify and segregate as to types, functions, and sizes. Store off the ground in a manner affording easy accessibility and not causing excessive rusting or coating with grease or other objectionable materials.

B. Handling

1. Handle and transport pipe, fittings, and other accessories in a manner to ensure delivery to the trench in sound undamaged condition.

PART 2 - PRODUCTS

2.01 GENERAL

A. All pipe and fittings shall be new and of the sizes indicated on the Drawings and as specified herein. For pipe larger than 24-inches, the CONTRACTOR shall provide gauged pipe, per Section 4.4 of AWWA C151, to the dimensional tolerances specified herein. The number of gauged pipe to be provided will be at the CONTRACTOR's option, but not less than one pipe section per one hundred feet of pipe for each size provided to assure uniformity and conformity to the specified requirements.

B. It shall be the CONTRACTOR's responsibility to verify dimensions of all pipes, valves, special castings, closures and fittings so that all of the pipe work performed will fit together properly and will conform to the arrangements shown on the Drawings.

C. The CONTRACTOR shall furnish and install all necessary fittings and special pieces required for closures, bends, branches, inlets, vaults, manholes and connections to other pipes. All fittings and specials shall be designed and constructed to meet the same pressure classification as that of the adjoining pipe, and shall conform to the standard details of the manufacturer.

D. Bells and spigots shall be at right angles to the axis of the opening and openings shall be at the exact angle shown.

2.02 CONNECTIONS TO EXISTING PIPE JOINTS

A. Where new piping is to be connected to existing piping the connection may be made by one of the following methods and as shown on the Drawings:

1. Use of standard manufacturer's adapters.
2. Use of custom manufactured adapters.

2.03 DUCTILE IRON PIPE AND FITTINGS

<table>
<thead>
<tr>
<th>Service</th>
<th>Pipe Material</th>
<th>Pipe Fittings</th>
</tr>
</thead>
<tbody>
<tr>
<td>4” Vent Piping</td>
<td>Ductile Iron, AWWA C150, AWWA C151, Pressure Class 250</td>
<td>Ductile Iron, AWWA C110 ANSI A21.10, Pressure Class 250</td>
</tr>
<tr>
<td>12” Water Main</td>
<td>Ductile Iron, AWWA C151, AWWA C151, Thickness Class 52</td>
<td>Ductile Iron, AWWA C110 or AWWA C153, Pressure Class 250</td>
</tr>
</tbody>
</table>

A. Ductile iron pipe for buried service shall be furnished in accordance with ANSI A21.41-1986 (AWWA C151-93) or latest revision thereof. Pressure classes for buried pipe shall be as noted on the drawings or as listed in the Pipe Schedule. Pipe shall be as manufactured by the American Cast Iron Pipe Company, U.S. Pipe and Foundry Company, Griffin Pipe Products Co., Clow Water Systems Co. or equal.

B. Joints for buried 20-inch diameter and smaller ductile iron pipe, fittings and specials shall conform to ANSI A21.11 (AWWA C-111) and shall be push-on or mechanical joint pipe. All pipe furnished with push-on joints shall meet the requirements of AWWA C111 and shall be jointed in accordance with AWWA C111 and the manufacturer’s recommendations. Mechanical joint pipe shall meet the requirements of AWWA C111.

C. Restrained pipe 20-inches diameter and smaller shall be mechanical joint and equipped with a mechanical joint restraint device that shall have a working pressure of at least 250 psi with a minimum safety factor of 2:1. The joint restraint device shall be "Megalug" by EBAA Iron, Inc. or equal. Joints for pipe 20-inches in diameter and smaller may alternately be restrained using “TR FLEX” ductile iron pipe joint of the U.S. Pipe and Foundry Company, or “FLEX-RING” of American Cast Iron Pipe Company or an approved equal. Restrained pipe lengths for pipe are indicated on the Drawings. Ductile iron retainer glands or welds will not be accepted.

D. Welded outlets for ductile iron pipe shall be fabricated from centrifugally cast ductile iron pipe, manufactured and tested in accordance with ANSI/AWWA C151/A21.51. Outlets shall be equipped with plain ends unless otherwise indicated on the Contract Drawings. Outlets shall have a working pressure of at least 250 psi with a minimum safety factor of 2:1. Welded outlets shall only be shop fabricated. Field welded outlets are not allowed.
E. All rubber gasket joints for ductile iron pressure pipe and fittings shall comply with ANSI A21.11 (AWWA C111).

F. Fittings and specials shall be manufactured in accordance with ANSI A21.10 (AWWA C-110) and shall have a minimum pressure rating 250 psi. The ductile iron used in the manufacture of ductile iron fittings and specials shall have a minimum tensile strength of 70,000 psi. For piping less than 16-inches in diameter, compact fittings manufactured in accordance with ANSI A21.53/AWWA C153 will be permitted.

G. Coatings and Linings
   1. Water Pipe – All ductile iron pipe 12” and greater in diameter shall be zinc coated meeting the requirement of AWWA C151 and wrapped with V-Bio Enhanced Polywrap meeting C105/A21.5. All ductile iron pipe shall also be asphaltic coated on the outside. The inside of ductile iron pipe and fittings for water pipe as specified in the pipe schedule shall be cement lined with double thickness and seal coated in accordance with AWWA C104. Unless otherwise indicated, the design thickness of the pipe shall be not less than the minimum shown in AWWA C150.

   2. All exposed ductile iron pipe and fittings shall be shop primed (with primer compatible with field painting) on exterior surfaces and given required finish coats in the field.

H. Each piece of ductile iron pipe shall have the weight and class designation conspicuously painted on it as near as possible to the flanged or bell end of the pipe and these designations shall be clearly legible.

I. All materials that may be in contact with potable water shall be in accordance with and approved by NSF Standard 61.

J. Pipe shall be supplied in standard lengths not to exceed 20 feet.

K. Ductile iron pipe shall have a minimum tensile strength of 60,000 psi with a minimum yield strength of 42,000 psi. Design shall be done for external and internal pressure separately using the larger of the two for the net design thickness. An additional allowance shall be made for corrosion and casting tolerances in accordance with AWWA C150.

   1. The following design conditions shall apply for pipe used as gravity sewer pipe:
      a. Test Pressure: per County standards
      b. Surge Allowance: 20 psi
c. Cover: As shown on the plans.
d. Wheel Load: AASHTO HS-20, with impact factor of 1.5
e. Soil Density: 120 pounds per cubic foot
f. Safety Factor: 1.5
g. Soil Modulus E': 300 psi
h. Design Pressure: 15
i. Trench Width: Transition
j. Laying condition: AWWA C150, as shown on the drawings

2. The following design conditions shall apply for pipe used as water pipe:

a. Working Pressure: 75 psi
b. Test Pressure: 150 psig
c. Surge Allowance: 100 psi
d. Cover: As shown on the plans.
e. Wheel Load: AASHTO HS-20, with impact factor of 1.5
f. Soil Density: 120 pounds per cubic foot
g. Safety Factor: 1.5
h. Soil Modulus E': 300 psi
i. Design Pressure: 75 psi
j. Laying condition: AWWA C150, as shown on the drawings

L. Plugs and Caps shall conform to AWWA C110 and shall be suitable for a minimum of 250 psi. All plugs and caps for piping 16-inches and larger shall be equipped with lifting eyes suitable for the weight of the unit furnished.

PART 3 - EXECUTION

3.01 EXISTING PIPING

A. Where new piping is to be connected to existing piping, the CONTRACTOR shall drain or purge the existing piping, cut, remove, grind and prepare the existing piping in every respect in order that it is suitable for connecting to the new piping.

B. Where existing pipe is to be abandoned and removed, the CONTRACTOR shall not reuse the existing pipe on this project. Pipes that have been removed shall be removed from the project sites and disposed of by the CONTRACTOR at an approved disposal site.

3.02 LAYING OF PIPE AND FITTINGS

A. General
1. For buried pipe, before joints are made, each pipe shall be properly bedded and no pipe shall be brought into position until the preceding length has been thoroughly bedded and secured in place. All defects due to settlement shall be corrected by the CONTRACTOR at no additional expense to the OWNER. Bell holes shall be dug sufficiently large to insure proper pipe joint construction. Pipe shall be bedded for the full length of barrel between bells. No springing of the pipe bells will be permitted during jointing. Each bell will be inspected for laying damage prior to backfilling. Trenching and backfilling details and requirements are shown on the Drawings and included in Section 02200.

2. Pipe joints shall be made in strict accordance with the pipe manufacturer's instructions. Allowable joint deflection shall be up to three quarters of the manufacturer’s recommendations. All fins and burrs shall be removed from pipe and fittings.

3. The interior of all pipes shall be thoroughly cleaned before they are laid and shall be kept clean until the acceptance of the completed work. At the end of the day, the open ends of all pipelines shall be provided with a stopper carefully fitted so as to keep dirt and other substances from entering. The stopper shall be kept in the end of the pipeline at all times when laying is not in actual progress.

4. The CONTRACTOR shall be responsible for keeping trenches free of water until the trench is completely backfilled and compacted.

5. Cut pipe accurately to length established at the site and work into place without springing or forcing. Replace by one of the proper length any pipe or fitting that does not allow sufficient space for proper installation of jointing material.

6. Blocking or wedging between bells and spigots will not be permitted. Lay bell-and-spigot pipe with bell end pointing in the direction of flow.

7. Ductile iron pipe, fittings, and appurtenances shall be unloaded, handled, and stored in accordance with AWWA C600.

8. Whenever ductile iron pipe requires cutting in the field, the work shall be done in a manner satisfactory to the ENGINEER with approved cutting tools which will leave a smooth end at right angles to the axis of the pipe and not otherwise damage the pipe or lining.

9. No field cutting and welding of ductile iron pipe will be permitted.

10. Jointing
a. Make push-on joints with the gaskets and lubricant specified herein; assemble in accordance with the applicable requirements of AWWA C600 for joint assembly.

b. Make mechanical joints with the gaskets, glands, bolts and nuts specified for this type joint, assemble in accordance with the applicable requirements of AWWA C600 for joint assembly and with the recommendations of Appendix A to AWWA C111/A21.11.

c. CONTRACTOR shall not exceed the manufacturers maximum recommended allowable deflection of the pipe joint. Where the pipe joint allows slip in the joint for restrained pipe, such as TR FLEX pipe by U.S. Pipe, the joint shall be pulled out to the maximum extension, where surfaces of the bell and spigot ends of the joint are in contact, before the next pipe section is installed.

3.03 TESTING

A. General

1. The Contractor shall schedule all tests with the Engineer at least 48 hours in advance, and shall conduct all acceptance testing in the presence of the Engineer. All testing shall be in accordance with Spotsylvania County Construction Specifications and Standards for Water and Sewerage Facilities unless otherwise noted in the Contract Documents.

2. Generally, piping, fittings and appurtenances will be tested from end to end. Pressure and leakage tests shall be performed on ductile iron siphon piping. Minimum test pressure for ductile iron siphon piping shall be 20 psi, measured at the inlet or discharge end of the siphon piping.

3. If the piping or any section or component thereof fails the tests and/or inspection, the Contractor shall, at his own expense, repair and replace any defective component and re-test until all requirements are met.

4. All defects revealed by testing shall be corrected without cost to Spotsylvania County. Testing and repairing shall be continued until test requirements are met. Repairs shall be made with new materials. No caulking of threaded joints, cracks, or holes will be acceptable. When it is necessary to replace pieces of pipe, the replacement shall be of the same material and thickness as the defective piece. Tests shall be repeated after defects disclosed thereby have been made good.

5. All piping including test bulkhead, caps or plugs shall be adequately braced and supported during the tests so that no movement, displacement or damage
A. Each section of the water piping including all water services, shall be subjected to a pressure test of 150 psi, or 1-1/2 times the working pressure whichever is greater, measured at the high point of the system. Maintain this pressure for a minimum of two hours with an allowable leakage (defined as the amount of water that must be added to maintain the test pressure within 5 psi of the test pressure) of not greater than:

\[ L = S \times D \times \sqrt{\frac{P}{133,200}} \]

Where:
- \( L \) = Allowable Leakage in Gallons per Hour
- \( S \) = the length of the pipe tested in feet
- \( D \) = the nominal pipe diameter in inches, and
- \( P \) = the average test pressure in psi during the leakage test.

Prior to applying pressure to the lines, all mechanical restraints shall have been completed to the satisfaction of the Contractor and the Inspector. As the pipes are being filled, all air shall be expelled from the pipes by providing hydrants at the high points of the system.

Any defects discovered during this test shall be repaired and the test repeated until the results are satisfactory to the Inspector. The Contractor shall provide all equipment, materials, and labor necessary to conduct the test. The Contractor shall provide a suitable test pump and properly calibrated gauge or other means for
measuring leakage, and a disinfected potable water tank, which is satisfactory to the Inspector.

B. Water for Testing: Water from the County’s water system shall be used for flushing, sterilization, and testing. A hydrant meter shall be obtained from the Department of Utilities and Contractors will be billed for water used. Filling of water line may be performed provided permission has been obtained from the Inspector. Contractor is not permitted to operate valves on existing lines unless otherwise directed by the County’s Inspector.

3.05 DISINFECTION OF WATER MAINS

A. Prior to being placed in service, the pipe line and appurtenances shall be disinfected in general accordance with ANSI/AWWA C651, latest edition, AWWA Standard for Disinfecting Water Mains and the supplemental procedures as set forth below.

1. “Section 3 of AWWA C651” emphasizes six basic procedures in the disinfection process. These procedures are to:
   a. Prevent contaminating materials from entering the water main during storage, construction, or repair;
   b. Remove, by flushing or other means, those materials that may have entered the water main;
   c. Chlorinate any residual contamination that may remain, and flush the chlorinated water from the main;
   d. Protect the existing distribution system from backflow due to hydrostatic pressure test and disinfection procedures;
   e. Determine the bacteriological quality by laboratory test after disinfection; and
   f. Make final connection of the approved new water main to the active distribution system.

2. Preliminary Flushing:

The main shall be flushed prior to disinfection at a velocity of not less than 2.5 ft/s unless the County determines that conditions will not permit the required flow. Adequate provisions shall be made by the Contractor for disposal and neutralization of flushing water, so that no physical or environmental damage results.

3. Forms of Chlorine for Disinfection:
It is the Contractor’s responsibility to be familiar with and have available for his employees the “Material Safety Data Sheets” of any products used as a source of chlorine and to provide the proper safety instructions and personal protective equipment to the employees mixing and using materials for disinfection of the water facilities.

a. Acceptable sources of chlorine for disinfection may be obtained from any of the following four sources:

1) Liquid sodium hypochlorite (household bleach).
2) Liquid sodium hypochlorite (industrial strength).
3) Calcium hypochlorite granules.
4) Calcium hypochlorite pills affixed to the interior of water pipe.

b. Only under extreme conditions and with the written approval of the Owner and under the direction of a holder of a State of Virginia Class III (or higher) water works operator’s license can chlorine gas, regulated through proper metering equipment, be mixed with water to obtain a suitable disinfecting solution.

c. The direct introduction of chlorine gas (or liquid) from a pressure cylinder into a water line shall not be allowed.

d. The mixing of a source of chlorine to obtain a suitable disinfecting solution shall be as follows:

1) Liquid sodium hypochlorite is supplied in strengths from 5.25 percent available chlorine (commercially available household bleach) to 15 percent available chlorine (industrial strength sodium hypochlorite). A water-sodium hypochlorite solution shall be prepared by adding liquid sodium hypochlorite to water.

2) A water calcium hypochlorite solution shall be prepared by dissolving calcium hypochlorite granules containing 65% available chlorine by weight in a pre-determined volume of water to make the desired water-calcium hypochlorite concentration. Disinfection of new mains by water calcium hypochlorite solution shall not be used unless a suction or in-line strainer is available on the solution pump to prevent any undissolved solids from entering the piping. An alternative method of straining the solution to remove undissolved granules may be approved by the Inspector on a case-by-case basis.
3) A water-chlorine gas solution may be used only when suitable equipment is available and shall be done under the direct supervision of a person familiar with the physiological, chemical, and physical properties of this element and who has a State of Virginia Class III or above water works operator’s license and is properly trained and equipped to handle any emergency that may arise. That person shall provide a written work plan to the Inspector outlining the intended approach to mixing the chlorine solution.

4. Method of Chlorine Application and Testing:

a. The continuous feed method of applying the disinfecting solution shall be as follows: Water from the existing distribution system or other approved sources of potable water supply shall flow through an approved flushing mechanism at a constant, measured rate into the newly-laid pipeline. The water shall be mixed with a chlorine-water solution as prepared above, also fed at a constant, measured rate. The two rates shall be proportioned so that the chlorine concentration of the water and water/chlorine solution in the pipe is elevated to and maintained at, a minimum of 50 mg/l available chlorine.

Since the forms of preparation for a water-sodium hypochlorite or water-calcium hypochlorite concentration are a batch process, a method acceptable to the Inspector shall be available to replenish the concentration being fed and mixed with the water flow, so there is no interruption of the flow of disinfection solution.

To assure that this concentration is maintained, the chlorine residual shall be measured at intervals not exceeding 2,000 feet and at the end of all branch lines or cul-de-sacs in accordance with the procedures outlined herein. During the application of the chlorine-water solution, valves, hydrants, and any other appurtenances, shall be operated in order to be thoroughly disinfected. Chlorine-water solution application shall continue until the entire new main is filled with water having a residual of a minimum of 50 mg/l chlorine solution. The chlorinated water shall be retained in the main for at least 24 hours.

b. After the applicable retention period, the heavily chlorinated water shall be flushed from the main until the chlorine residual of the water leaving the main is equal to the chlorine residual of the incoming system water. At that time, the new system shall be valved off to allow the residual to dissipate to 0.2 mg/l before taking samples for
bacteriological analysis. Additional instructions for disposal of the heavily chlorinated water are covered later in this section.

B. Bacteriological Tests:

1. After final flushing, and before the water main is placed in service, samples shall be collected and tested for bacteriological quality. Two consecutive negative tests from the same location shall show the absence of coliform organisms. At least two samples shall be collected by the Owner at least 24 hours apart at intervals determined by the Inspector (not exceeding 2,000 feet apart and at the end of all branch lines and cul-de-sacs) and tested by a qualified laboratory selected by the Owner. The Owner shall bill the Contractor a standard fee, to be set by the Owner, for this service including all retests.

2. Samples for bacteriological analysis shall be collected in approved sterile bottles or bags treated with sodium thiosulfate. If laboratory results indicate the presence of coliform bacteria, the samples are unsatisfactory, and disinfection shall be repeated as prescribed above until the samples are satisfactory. Cleaning, disinfection, and testing shall be under the direction of the Inspector but remains the responsibility of the Contractor. The Contractor shall be responsible for any cost associated with the loading, hauling, discharging, and dechlorination of the heavily chlorinated water.

3.06 PIPE CLEANLINESS

A. For all pipe furnished in the work, the following requirements shall be required. When installed pipe is left overnight, water tight plugs will be used to prevent any dirt, debris or dust from entering the pipe. The CONTRACTOR will be responsible for pipe cleanliness at all times.

B. All pipe joint and lubricant compounds used in the pipe assembly shall be non-toxic in any form or amount and shall not impart any taste or odor to the water. The substance shall be non-biodegradable.

END OF SECTION
SECTION 02625

POLYVINYLCHLORIDE PIPE AND FITTINGS

PART 1 - GENERAL

1.01 DESCRIPTION

A. This Section covers the requirements for furnishing all labor, materials, equipment and appurtenances necessary for the complete and satisfactory construction of all polyvinylchloride (PVC) exterior piping and fittings shown on the Drawings and as specified herein.

B. All work, materials and incidentals necessary to the construction of the piping, including excavation and refill, excavation support, laying and joining of pipe, and other miscellaneous work shall meet the requirements of Spotsylvania County, Department of Utilities Standards and to the applicable requirements of other Sections and as modified herein.

C. The CONTRACTOR shall verify all dimensions of valves, special fittings, pipe, equipment, etc., so that all of the pipe work performed will fit together properly and will conform to the arrangement as shown on the Drawings. In selecting laying lengths of fittings, the CONTRACTOR shall be guided by the dimensions of fittings and existing pipe systems to which connections are made and by the indicated dimensions on the Drawings. All pipe and specials shall be accurate to the dimensions shown. Bells, spigots, and flanges shall be at right angles to the axis of the opening, and openings shall be at the exact angle specified.

D. The CONTRACTOR shall verify the type of pipe, the joint type, configuration and direction of bell and spigot and the exact horizontal and vertical location for connections at the locations indicated on the Drawings, finalize all lay lengths, and confirm pipe layout prior to shop drawings submittal. Any deviation from the connection concept indicated which prevents construction as shown shall be brought to the ENGINEER’s attention for resolution prior to shop drawing preparation. The CONTRACTOR shall provide the pipe material to match the existing pipe and/or provide the required adapters to connect to the existing pipe.

1.02 RELATED SECTIONS

A. Section 02200 – Earthwork, Excavation, Trenching and Backfilling
B. Section 02223 – Vibration Control
C. Section 02615 – Ductile Iron Pipe and Appurtenances

1.03 SHOP DRAWINGS
A. The CONTRACTOR shall submit shop drawings for all piping systems. The shop drawing submittals shall include all design computations and computer printouts of computations. Design calculations and detailed fabrication drawings shall be submitted for all fabricated fittings. Manufacturers’ data and/or materials lists shall be submitted for standard fittings, inlets, materials and standard pipe sections in sufficient detail to show compliance with all requirements of the Specifications. Certificates shall be submitted as required by AWWA standards for pipeline and fittings including factory applied linings and joint material; cast iron frames covers and grates, and precast structure sections.

B. CONTRACTOR shall coordinate and furnish submittals in accordance with Section 01300 - Submittals.

C. CONTRACTOR shall submit certifications by the manufacturer indicating compliance with the specified requirements.

1.04 EXISTING UTILITIES

A. Existing utilities have been indicated on the Drawings in accordance with the best information available for the information of the CONTRACTOR. The OWNER expressly disclaims any responsibility for accuracy or completeness of information shown. The locations of existing utilities shall be determined by the CONTRACTOR and any deviations from the information shown on the Drawings shall be brought to the ENGINEER’s attention for resolution of any conflicts which prevent the construction as shown on the Drawings. Existing utilities and services shall be carefully protected; any damage to utilities caused by the work shall be immediately repaired by the CONTRACTOR to the satisfaction of the OWNER, using materials of the kinds damaged. No additional compensation will be allowed for such repair work.

B. The CONTRACTOR shall bear the entire cost of any and all monetary penalties which may be assessed by utilities whose facilities are damaged and/or put out of service by the CONTRACTOR during the prosecution of the work under this Contract.

C. The CONTRACTOR shall notify Miss Utility 48 hours on advance of digging.

1.05 DELIVERY, STORAGE and HANDLING

A. Delivery and Storage
   1. Piping - Inspect materials delivered to site for damage; store with minimum of handling. Store piping, jointing materials and rubber gaskets under cover. Do not store materials directly on the ground. Keep inside of pipes and fittings free of dirt and debris.
2. Metal Items - Check upon arrival; identify and segregate as to types, functions, and sizes. Store off the ground in a manner affording easy accessibility and not coating with grease or other objectionable materials.

B. Handling

1. Handle and transport pipe, fittings, and other accessories in a manner to ensure delivery to the trench in sound undamaged condition.

PART 2 - PRODUCTS

2.01 GENERAL

A. All pipe and fittings shall be new and of the sizes indicated on the Drawings and as specified herein. For pipe larger than 24-inches, the CONTRACTOR shall provide gauged pipe to the dimensional tolerances specified herein. The number of gauged pipe to be provided will be at the CONTRACTOR's option, but not less than one pipe section per one hundred feet of pipe for each size provided to assure uniformity and conformity to the specified requirements.

B. It shall be the CONTRACTOR's responsibility to verify dimensions of all pipes, valves, special castings, closures and fittings so that all of the pipe work performed will fit together properly and will conform to the arrangements shown on the Drawings.

C. The CONTRACTOR shall furnish and install all necessary fittings and special pieces required for closures, bends, branches, inlets, vaults, manholes and connections to other pipes. All fittings and specials shall be designed and constructed to meet the same pressure classification as that of the adjoining pipe, and shall conform to the standard details of the manufacturer.

D. Bells and spigots shall be at right angles to the axis of the opening and openings shall be at the exact angle shown.

2.02 CONNECTIONS TO EXISTING PIPE JOINTS

A. Where new piping is to be connected to existing piping the connection may be made by one of the following methods and as shown on the Drawings:

1. Use of standard manufacturer's adapters.

2. Use of custom manufactured adapters.

2.03 PVC PIPE and FITTINGS
PIPE and FITTING SCHEDULE

<table>
<thead>
<tr>
<th>Service</th>
<th>Pipe Material</th>
<th>Pipe Fittings</th>
</tr>
</thead>
<tbody>
<tr>
<td>8” and 12” Gravity</td>
<td>PVC - ASTM D3034 SDR 26 (PS 115)</td>
<td></td>
</tr>
<tr>
<td>Sewer Piping</td>
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<td></td>
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<tr>
<td>18” and 24” Gravity</td>
<td>PVC - ASTM F679 SDR 26 (PS 115)</td>
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<tr>
<td>Sewer Piping</td>
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</tbody>
</table>

2.04 PVC PRESSURE PIPE

A. Polyvinyl chloride (PVC) Pressure Piping:

1. PVC pressure piping shall conform to the requirements of AWWA C900, “Standard for Polyvinyl Chloride (PVC) Pressure Pipe, 4 in. Through 12 in. For Water Distribution”, Class 150 (DR 18) or AWWA C905, “Standard for Polyvinyl Chloride (PVC) Pressure Pipe and Fabricated Fittings, 14 in. Through 48 in. for Water Transmission and Distribution”. PVC pressure piping shall be furnished in cast-iron pipe equivalent outside diameters with elastomeric gasket joints. The use of flanged joints will not be allowed with PVC pressure pipe.

2. PVC pipe, couplings and fittings shall be made from virgin PVC resin that has been compounded to provide physical and chemical properties that equal or exceed cell class 12454-B as defined in ASTM D1784 and shall qualify for a hydrostatic design basis (HDB) of 4,000 psi at 73.4 °F per the requirements of PPI TR-3.

3. Additives and fillers, including but not limited to stabilizers, antioxidants, lubricants, colorants, etc., shall not exceed 10 parts by weight per 100 parts of PVC resin in the compound.

4. Joints for PVC pressure pipe shall be a three (3) sealing point system. The gasket shall be molded and factory installed. The gasket shall be reinforced with a steel band and met the requirements of ASTM F477.

5. PVC pressure piping shall be supplied in the sizes noted on the plans and shall be furnished in 20 foot laying lengths.
B. PVC Fittings

1. PVC fittings for PVC pressure pipe shall be restrained joint.

2. PVC fittings shall be Certa-Loc C900/RJ Restrained Joint PVC Pipe Sweeps by CertainTeed or an approved equal. Restrained PVC fittings shall meet or exceed the requirements of AWWA C900 and shall have a minimum working pressure rating of 150 psi.

C. Ductile Iron Fittings

1. Ductile iron fittings for PVC pressure pipe shall be restrained joint.

2. Ductile iron fittings on PVC lines shall be zinc coated meeting the requirements of AWWA C151 and wrapped with V-Bio Enhanced Polywrap meeting C105/A21.5. Fittings shall have an asphaltic coated outside and a cement lined with double thickness and seal coated inside in accordance with AWWA C104.

3. Ductile iron fittings shall be Certa-Loc Restrained Joint Mechanical Gland Adapters by CertainTeed or an approved equal. Ductile iron shall meet or exceed ASTM A536, Grade 70-50-05 or 60-42-10. Restrained ductile iron fittings shall meet or exceed the requirements of AWWA C900 and shall have a minimum working pressure rating of 150 psi.


5. Bolts shall conform to AWWA/ASTM C111/A21.11.

D. Each piece of pipe shall have the material, size, pressure class designation, dimension ratio, manufacturer’s name and production-record code conspicuously painted on it as near as possible to the flanged or bell end of the pipe and these designations shall be clearly legible.

2.05 PVC GRAVITY SEWER PIPE

A. Polyvinyl chloride (PVC) Gravity Sewer Pipe:

1. PVC gravity sewer pipe shall meet or exceed the requirements of:

   a. ASTM D3034 “Standard Specification for Type PSM Polyvinyl Chloride (PVC) Sewer Pipe and Fittings”, SDR 26 (PS 115)
   b. ASTM F679 “Standard Specification for Polyvinyl Chloride (PVC) Large Diameter Plastic Gravity Sewer Pipe and Fittings”.
c. ASTM 2241 “Standard Specification for Polyvinyl Chloride (PVC) Pressure Rated Pipe (SDR Series)”.

2. PVC pipe, couplings and fittings shall be made from virgin PVC resin that has been compounded to provide physical and chemical properties that equal or exceed cell class 12454-B or 12364-B as defined in ASTM D1784 and shall qualify for a hydrostatic design basis (HDB) of 4,000 psi at 73.4 °F per the requirements of PPI TR-3.

3. Additives and fillers, including but not limited to stabilizers, antioxidants, lubricants, colorants, etc., shall not exceed 10 parts by weight per 100 parts of PVC resin in the compound.


5. Pipe shall be supplied in the sizes and SDR Series noted on the plans and shall be furnished in standard laying lengths of 13 and 20 feet.

B. PVC Plastic Joints and Jointing Material

1. Joints shall conform to ASTM D3212.

2. Gaskets shall conform to ASTM F477.

C. Each piece of pipe shall have the material, size, pressure class designation, dimension ratio, manufacturer’s name and production-record code conspicuously painted on it as near as possible to the flanged or bell end of the pipe and these designations shall be clearly legible.

PART 3 - EXECUTION

3.01 EXISTING PIPING

A. Where new piping is to be connected to existing piping, the CONTRACTOR shall drain or purge the existing piping, cut, remove, grind and prepare the existing piping in every respect in order that it is suitable for connecting to the new piping.

B. Where existing pipe is to be abandoned and removed, the CONTRACTOR shall not reuse the existing pipe on this project. Pipes that have been removed shall be removed from the project sites and disposed of by the CONTRACTOR at an approved disposal site.
3.02 LAYING OF PIPE AND FITTINGS

A. General

1. For buried pipe, before joints are made, each pipe shall be properly bedded and no pipe shall be brought into position until the preceding length has been thoroughly bedded and secured in place. All defects due to settlement shall be corrected by the CONTRACTOR at no additional expense to the OWNER. Bell holes shall be dug sufficiently large to insure proper pipe joint construction. Pipe shall be bedded for the full length of barrel between bells. No springing of the pipe bells will be permitted during jointing. Each bell will be inspected for laying damage prior to backfilling. Trenching and backfilling details and requirements are shown on the Drawings and included in Section 02200.

2. Pipe joints shall be made in strict accordance with the pipe manufacturer’s instructions. Allowable joint deflection shall be up to three quarters of the manufacturer’s recommendations. All fins and burrs shall be removed from pipe and fittings.

3. The interior of all pipes shall be thoroughly cleaned before they are laid and shall be kept clean until the acceptance of the completed work. At the end of the day, the open ends of all pipelines shall be provided with a stopper carefully fitted so as to keep dirt and other substances from entering. The stopper shall be kept in the end of the pipeline at all times when laying is not in actual progress.

4. The CONTRACTOR shall be responsible for keeping trenches free of water until the trench is completely backfilled and compacted.

5. Cut pipe accurately to length established at the site and work into place without springing or forcing. Replace by one of the proper length any pipe or fitting that does not allow sufficient space for proper installation of jointing material.

6. Blocking or wedging between bells and spigots will not be permitted. Lay bell-and-spigot pipe with bell end pointing in the direction of flow.

B. PVC Pressure Pipe

1. PVC pressure pipe, fittings, and appurtenances shall be unloaded, handled, and stored in accordance with AWWA C605.
2. Whenever PVC pressure pipe requires cutting in the field, the work shall be done in a manner satisfactory to the Engineer with approved cutting tools which will leave a smooth end at right angles to the axis of the pipe and not otherwise damage the pipe.

3. Final alignment and grade shall not contain any pipe joints deflected more than the manufacturer's recommendations.

4. Jointing
   a. Make push-on joints with the gaskets and lubricant previously specified; assemble in accordance with the applicable requirements of AWWA C900 for joint assembly.
   b. Make PVC fitting joints with the gaskets and splines specified for this type joint, assemble in accordance with the manufacturer’s requirements for joint assembly.
   c. Make mechanical joints with the gaskets, glands, splines, bolts and nuts specified for this type joint, assemble in accordance with the manufacturer’s requirements for joint assembly.

C. PVC Gravity Sewer Pipe
   1. PVC gravity sewer pipe, fittings and appurtenances shall be unloaded, handled, and in accordance with AWWA C900.
   2. Whenever PVC gravity sewer pipe requires cutting in the field, the work shall be done in a manner satisfactory to the Engineer with approved cutting tools which will leave a smooth end at right angles to the axis of the pipe and not otherwise damage the pipe.
   3. Final alignment and grade shall match those shown on the drawings. Alignments between manholes shall be straight with no deflections.
   4. Jointing
      a. Make push-on joints with the gaskets and lubricant previously specified; assemble in accordance with the manufacturer’s requirements for joint assembly.

3.03 TESTING

A. General
   1. The Contractor shall schedule all tests with the Engineer at least 48 hours in advance, and shall conduct all acceptance testing in the presence of the
Engineer. All testing shall be in accordance with Spotsylvania County Construction Specifications and Standards for Water and Sewerage Facilities unless otherwise noted in the Contract Documents.

2. Generally, piping, fittings and appurtenances will be tested from end to end. Pressure and leakage tests shall be performed on ductile iron siphon piping. Minimum test pressure for ductile iron siphon piping shall be 20 psi, measured at the inlet or discharge end of the siphon piping.

3. If the piping or any section or component thereof fails the tests and/or inspection, the Contractor shall, at his own expense, repair and replace any defective component and re-test until all requirements are met.

4. All defects revealed by testing shall be corrected without cost to Spotsylvania County. Testing and repairing shall be continued until test requirements are met. Repairs shall be made with new materials. No caulking of threaded joints, cracks, or holes will be acceptable. When it is necessary to replace pieces of pipe, the replacement shall be of the same material and thickness as the defective piece. Tests shall be repeated after defects disclosed thereby have been made good.

5. All piping including test bulkhead, caps or plugs shall be adequately braced and supported during the tests so that no movement, displacement or damage will result from the application of the test pressure. Relief devices in the various systems shall be capped or plugged during the tests.

6. All equipment used in testing shall be provided by the Contractor, shall be subject to the approval of the Engineer, and shall be such as to properly develop, maintain and measure hydrostatic test pressures and leakage rates. Where devices such as meters, recorders, charts, plugs, caps, blind flanges, corporation stops or bulkheads are required to develop, maintain and measure test pressures, these devices shall be furnished and installed by the Contractor.

7. The Contractor shall submit to the Engineer a record of all leakage tests conducted.

8. The Owner will not make any taps in the pipeline nor insert plugs in tapped locations.

3.04 TESTING OF NEW GRAVITY SEWERS (NON-PRESSURE):

A. Testing Technique for Sanitary Sewers (Non-Pressure):
1. Sanitary sewer lines 42” in diameter and smaller shall be tested after backfill using a low-pressure air test in accordance with ASTM F1417, latest edition. Sewer lines larger than 42” in diameter shall be tested by infiltration/exfiltration test. All manholes shall be vacuum tested. All testing shall be conducted in the presence of the County’s Inspector. The Contractor shall provide all labor, materials, tools, and equipment necessary to make the tests. All equipment and methods used shall be acceptable to the Owner. All monitoring gauges shall be subject to calibration, if deemed necessary.

B. Low-Pressure Air Test (Sewer Pipe 42” and Smaller Diameter):

1. Summary of Method: Plug the section of the sewer line to be tested. Introduce low-pressure air into the plugged line. Use the quantity and rate of air loss to determine the acceptability of the section being tested.

2. Preparation of the Sewer Line: If required by County, flush and clean the sewer line prior to testing. Give special attention to laterals. Test will be conducted with laterals installed from the main to plugs for future connection. Plug all pipe outlets using approved pneumatic plugs with a sealing length equal to or greater than the diameter of the line to be tested. Prior to use, the pneumatic plugs must be tested by plugging both ends of a single joint of pipe. The plugs shall be pressurized to 25 psig (or other pressure defined by the pneumatic plug manufacturer and accepted by the County prior to testing), then the pipe pressurized to 5 psig. The plugs must not move, and bracing is not allowed.

3. Ground Water Determination: If a line is located below the water table the elevation of the water table must be determined prior to testing. To determine the elevation of the water table the following procedure shall be utilized unless another procedure is approved by the Inspector. Install a ½ inch capped galvanized pipe nipple, approximately 12” long, through the manhole on top of the lowest sewer line in the manhole. Immediately prior to the line acceptance test, the ground water elevation shall be determined by removing the pipe cap and blowing air through the pipe nipple into the ground so as to clear it, and then connecting a clear plastic hose to the pipe nipple. The hose shall be held vertically and a measurement of the height in feet of water over the invert of the pipe shall be taken 30 seconds after the water has reached a steady level in the plastic hose.

4. Procedures: Determine the duration for the section under test by computation from the applicable formulas shown in ASTM F1417, latest edition. The pressure-holding time is based on an average holding pressure of 3 psi gage (a drop from 3.5 psi to 2.5 psi gage). The allowable leakage rate Q is 0.0015 cubic feet per minute per square foot of pipe area being tested.
Air Test: Minimum Time for 1 psig Drop

<table>
<thead>
<tr>
<th>Pipe Diameter (inches)</th>
<th>Minimum Time up to Length Shown (Min: Sec)</th>
<th>Length for Minimum Time (Feet)</th>
<th>Minimum Time for Longer Length (Seconds)</th>
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<tr>
<td>4</td>
<td>3:46</td>
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<tr>
<td>33</td>
<td>31:10</td>
<td>72</td>
<td>25.852 L</td>
</tr>
</tbody>
</table>

The above values are extracted from Table 1, ASTM F1417 and are based on the equation:

\[ T = 0.085 \frac{DK}{Q} \]

Where: \( T \) = minimum time require for 1 psig pressure drop, Seconds

\( D \) = measured pipe diameter, inches

\( Q \) = allowable leakage (0.0015 cfm/sf of internal surface)

\( K = 0.000419 \times DL \) (NOT LESS THAN 1)

\( L \) = length of tested section of pipe, feet

Lateral service lines are included in this test, and their effects shall be considered only if the tested section does not achieve the required minimum time. In that case, minimum time may be calculated by:

\[ T = \left[ 0.085 \frac{K \left(D_1^2L_1 + D_2^2L_2 + \ldots + D_n^2L_n\right)}{Q \left(D_1L_1 + D_2L_2 + \ldots + D_nL_n\right)} \right] \]

Where variables are as above except:

\( D_n \) = nominal diameter of each pipe size being tested, inches


\[ L_n = \text{length of pipe in each diameter being tested, feet} \]

\[ K = 0.000419 \times (D_1 L_1 + D_2 L_2 + \ldots + D_n L_n) \text{ not less than} 1 \]

If the tested section meets the revised minimum time as calculated above, it shall be accepted.

Where the required minimum time exceeds 60 minutes, a pressure drop of 0.5 psig may be used as an alternate. The required minimum time for a 0.5 psig drop shall be half of the time required for the 1.0 psig drop as presented or as calculated above.

Determine the required test pressure. The test pressure shall be 3.5 psig unless the pipe to be tested is below the water table. If the pipe to be tested is submerged below the water table, the test pressure shall be increased by 1.0 psi for every 2.31 feet the ground water level is above the lowest invert of the tested section of the sewer.

Add air until the internal air pressure of the sewer line is raised to approximately 0.5 psi gage above the test pressure. After this internal pressure is obtained, allow time for the air pressure to stabilize. The pressure will normally show some drop until the temperature of the air in the test section stabilizes.

When the pressure has stabilized, and is at or above the starting test pressure of 3.5 psi as adjusted for water table elevation, commence the test. Before starting the test, the pressure may be allowed to drop to the starting gage pressure. Record the drop in pressure for the test period. If the pressure drops more than 1.0 psi gage during the test period, the line fails. The test may be discontinued when the prescribed test time has been completed even though the 1.0 psi gage drop has not occurred.

The test procedure may be performed prior to completing backfilling at the Contractor’s option solely to identify leakage prior to backfilling, but must be performed after completion of backfilling. Acceptance shall be based only on testing completed after backfilling of the excavation.

5. Safety: The air test may be dangerous if, because of lack of understanding or carelessness, a line is improperly prepared. As a safety precaution, pressurized equipment shall include a regulator or relief valve set at no more than 10 psi to avoid over-pressurizing and damaging an otherwise acceptable line. No one shall be allowed in the manholes during testing.

3.04 CLOSED CIRCUIT TELEVISION INSPECTION
A. Closed Circuit Television Color (CCTV) Inspection by a National Association of Sewer Service Companies (NASSCO) certified entity is required for all new sewer mains and laterals. Laterals shall be installed and inspected by the Contractor who installs the sewer main from the main to either the cleanout at the served structure if service is provided concurrently with construction of the new main, or to the cleanout at the property line or easement boundary if service will be provided at a later date.

B. Laterals must be separately CCTV inspected if they are not connected for service concurrently with the installation of the sewer main. Lateral CCTV inspections shall be completed from the service cleanout near the served structure to the sewer main, including passing through the cleanout at the property line or easement boundary. Lateral CCTV inspections shall be conducted by the Contractor who installs the lateral from the property line to the structure.

C. Video recordings of inspections must be turned over to and reviewed by the Inspector prior to acceptance. Inspectors must be notified when CCTV inspections are being conducted and may require their attendance.

D. CCTV inspection will be done one manhole section at a time. Flow in the section being inspected should normally be limited to the allowable leakage in the new main. Any flow will be suitably controlled.

E. The television camera used for the inspection shall be one specifically designed and constructed for such inspection. Lighting for the camera shall be suitable to allow a clear color picture of the entire periphery of the pipe. The camera shall be operative in 100% humidity conditions. The camera, television monitor, and other components of the video system shall be capable of producing picture quality to the satisfaction of the Inspector.

F. The camera shall be moved through the line in either direction at a moderate rate not exceeding 30 feet per minute, stopping when necessary to permit proper documentation of the sewer’s condition. Manual winches, power winches, TV cable, and powered rewinds or other devices that do not obstruct the camera view or interfere with proper documentation of the sewer conditions shall be used to move the camera through the sewer line.

G. When manually operated winches are used to pull the television camera through the line, telephones or other suitable means of communication shall be set up between the two manholes of the section being inspected to ensure good communications between members of the crew.

H. The importance of accurate distance measurements is emphasized. Measurement for location of defects shall be above ground by means of a meter device. Marking on the cable, or the like, which would require interpolation for depth of manhole, will
not be allowed. Accuracy of the distance meter shall be checked by use of a walking meter, roll-a-tape, or other suitable device and the accuracy shall be satisfactory to the County’s Representative.

I. Documentation of the television results shall include:

1. Television Inspection Logs: Printed location records shall be kept by the Contractor and will clearly show the location in relation to an adjacent manhole of each infiltration point observed during inspection. In addition, other points of significance such as locations of lateral sewers, unusual conditions, and other discernible features will be recorded and a copy of such records will be supplied to the County.

2. Video Recordings: The purpose of video recording shall be to supply a visual and audio record of problem areas of the lines that may be replayed. Video recording playback shall be at the same speed that it was recorded. Slow motion or stop-motion playback features may be supplied at the option of the Contractor. The Contractor shall have all video recordings and necessary playback equipment readily accessible for review by the County during the project. All initial recordings and any re-inspections shall be supplied to and will become the property of the County on acceptance of the sewer main. Video recordings must be in a standard digital format (.avi, .mpeg, etc.) approved by the Department of Utilities. The Contractor may maintain a separate copy for his records.

3.05 DEFLECTION TESTING OF PVC PIPE

A. The installed PVC gravity sewer pipe shall not be deflected (out of round) by more than 5% of 100% of the interior pipe diameter as per ASTM 3034.

B. The Engineer will perform visual inspections of the installed pipe to determine if the pipe has been installed out of round. Following the visual inspection, at his option, the Engineer may require deflection testing to determine if a section of pipe is suspected of being deflected beyond the 5% limit.

C. Deflection testing will be performed by pulling a properly sized mandrel or sewer ball through the section of pipe to be tested. Testing results shall be “Go, No Go”. If the mandrel passes through the pipe the pipe will be accepted as not deflected. If the mandrel fails to pass through the test section of pipe, the section shall be replaced and retested. Pipe that fails a deflection test shall not be reused. Passing a deflection test does not guarantee that a section of pipe will not be rejected for being out of alignment or off grade.
D. The maximum pulling force on the mandrel shall not be greater than 20 ft-lb. The maximum outside diameter of the mandrel shall not be less than 5% of the average inside diameter (as published by the pipe manufacturer) of the pipe to be tested.

E. The Contractor shall be responsible for providing all equipment required for deflection testing.

F. Reinforced concrete pipe and ductile iron pipe will be exempt from deflection testing.

3.06 PIPE CLEANLINESS

A. For all pipe furnished in the work, the following requirements shall be required. When installed pipe is left overnight, water tight plugs will be used to prevent any dirt, debris or dust from entering the pipe. The CONTRACTOR will be responsible for pipe cleanliness at all times until the pipe is satisfactorily bacteriological tested and accepted by the Owner.

B. All pipe joint and lubricant compounds used in the pipe assembly shall be non-toxic in any form or amount and shall not impart any taste or odor to the water. The substance shall be non-biodegradable.

END OF SECTION
SECTION 02920

STONE TOE BANK STABILIZATION

PART 1 - GENERAL

1.01 DESCRIPTION

This work shall consist of furnishing and installing stone toe bank stabilization structures within the stream channel, as specified in the Contract Documents, or as directed by Engineer or Owner.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Stone Toe Rock

1. Stone toe rock shall be VDOT Class I Stone toe consists of rock placed below the invert of the proposed channel and extended up the bank to 1/3 or ½ of the bank height, or as designated on the plans and details.

B. Backfill Stone

1. Backfill behind the Stone Toe Rock shall be VDOT #57 stone. The backfill shall be placed behind the stone toe to an elevation equal to the top elevation of the stone toe rock.

C. EC-2 Erosion Control Blankets (Woven Coir Fiber Matting)

1. Coir fiber matting shall consist of 100% woven coconut fiber matting (Rolanko BioDmat70, Ecodepot Ecomatting 70®, BonTerra® CF7 Matting, Nedia Koirmatting 700®, Belton GeoCoir Dekowe 700® or equivalent). Source of coir fiber matting shall be submitted to engineer for review and approval prior to beginning construction. Installation shall be in accordance with the manufacturer’s recommendations, or as directed by engineer. The blankets shall meet the following specifications:

   Material: 100% coir fiber twine or yarn
   Minimum Thickness: 0.30 inches
   Elongation (Dry/Wet): 33%/36% (approximate)
   Minimum Weight: 20.6 oz/SY
   Maximum Open Area: 65%
   Minimum Life Expectancy: 3 years
   Tensile Strength: 432x138 lb/ft.
   Water Velocity: 12 ft/sec.
Shear Stress: 4.6 lb/sf

2. Landscape Staples required to secure the coir fiber matting shall be made of 12 gage or 1/8” (0.125”) diameter new steel wire formed into a “U” shape not less than 6 inches in length with a throat of 1 inch in width.

D. Live Stakes

1. Shall consist of a mix of Silky Dogwood (*Cornus amomum*) and Redosier Dogwood (*Cornus sericea*). Live stakes shall be 24 to 36 inches in length and 1/2” to 2” in diameter. The bottom end of the live stakes shall be cut at an angle and the top end cut square to facilitate insertion into the soil. Each stake shall be relatively straight, with no signs of disease, damage or deformity. Stakes must be in a live, dormant condition when installed. Stakes which have broken or are dead will not be accepted.

2. All live stakes shall be harvested locally or purchased from a commercial supplier. For all live stakes obtained from a commercial supplier, a source of supply shall be submitted to the engineer within 2 weeks of contract award and shall guarantee that the plant material is reserved for the Contractor.

3. Seed - Seed required for the stream banks shall be as follows:

<table>
<thead>
<tr>
<th>Common Name</th>
<th>Scientific Name</th>
<th>Pounds/1,000 sf</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annual Ryegrass</td>
<td><em>Lolium ultiflorum</em></td>
<td>2</td>
</tr>
<tr>
<td>Virginia Wild Rye</td>
<td><em>Elymus virginicus</em></td>
<td>2</td>
</tr>
</tbody>
</table>

PART 3 - EXECUTION

3.01 STONE TOE

A. A trench shall be excavated to a minimum of 1 foot below existing stream invert, or as indicated on the plans or directed by the Engineer. The trench shall be two feet in width, and extend the length along the stream channel as indicated on the plans. The trench shall be filled with Stone Toe Rock. The Stone Toe Rock shall be extended to an elevation as indicated on the plans, but no less than 1/3rd of the bank height. The terminal ends of each stone toe shall be keyed into the bank a minimum of 4 feet.

3.02 BACKFILL STONE

A. Backfill stone shall be placed behind the stone toe to the elevation of the top of the stone toe.

3.03 EXCAVATION / GRADING OF STREAM BANK

A. The stream bank shall be graded to the slope required in the Contract Documents.
Trash, debris, and vegetation should be removed prior to grading. Excess material shall not be wasted in the stream channel or along the banks.

3.04 TOP SOILING AND SEED BED PREPARATION

A. The surface of the graded bank shall be covered with 4 to 6 inches of salvaged top soil. The surface of the stream bank shall be fine graded to provide an appropriate seed bed. All roots, stumps, and stones that project from the bank surface shall be removed to insure that a smooth surface is provided for seeding and the installation of matting.

3.05 SEEDING

A. Upon completion of grading the stream banks the exposed banks shall be seeded immediately with the seed mix specified. Application of mulch, lime and fertilizer will not be necessary for seeding the stream banks however coir fiber matting shall be installed over the seeding.

3.06 EC-2 EROSION CONTROL BLANKETS (COIR FIBER MATTING)

A. Coir Fiber Matting shall be installed to stabilize the stream banks above the stone toe. Place the coir fiber matting immediately upon final grading and seeding. Matting shall be unrolled smoothly and firmly upon the seeded surface and shall extend the length of the stream bank in the direction of water flow. Stretching shall be avoided. Matting shall extend a minimum of 1 foot beyond the top of slope. Key in the top slope ends of matting in a 6 inch deep trench and tamp firmly.

B. Blanket ends shall overlap approximately 1 foot with the upslope blanket over the down slope blanket. The overlapping area shall be secured with staples spaced at a minimum of 2 feet on center. Matting shall be overlapped a minimum of 12 inches with upstream matting on top of downstream matting.

C. Staples shall be placed across the ends, overlaps, and trenches approximately 1 foot apart. Staples shall be installed approximately 2 foot apart along the remainder of the matting. Matting shall be overlapped a minimum of 12 inches with upstream matting on top of downstream.

3.07 LIVE STAKES

A. Live stakes shall be installed into the bank above the stone toe as detailed in the plan. Live stakes shall be installed at the spacing and configuration presented in the details of the project drawings. Total live stake density will be 2-4 stakes per square yard.

B. The planting season shall be from February 1 through March 30 for the live stakes. Live stakes shall be installed within 48 hours of harvesting or shall be stored in a refrigerated cooler, between 26 and 32 degrees Fahrenheit. Live stakes stored more
than a few days shall be soaked prior to planting by immersing bottom half of stake in water for 2-4 days. Live stakes shall be stored so they are continually shaded and protected from wind and direct sunlight. Live stakes shall remain moist at all times before planting.

C. Live stakes shall be installed so that 2/3 to 3/4 of their length is buried. Rebar or the like should be used to initiate a pilot hole. All stakes shall be tamped into the pilot hole, with buds oriented in an upward direction, to insure continuous soil to stake contact and with no excessive voids in the surrounding soil materials. The area around each live stake shall be compacted by foot after the live stake has been installed. Following installation, loppers will be used to cut 1 to 2 inches off the top of each stake.

3.08 MAINTENANCE

A. During planting, all areas shall be kept neat, clean and free of all trash and debris, and all reasonable precautions shall be taken to avoid damage to existing plants, turf, structures and private property.

B. Remove all tags, labels, strings and wire from the plant materials, unless otherwise directed by the ENGINEER.

C. Final cleanup shall be the responsibility of the CONTRACTOR and consist of removing all trash and materials incidental to the project and disposing of them off-site.

D. The plant material shall be maintained and monitored for two (2) years after completion, final inspection and approval of the planting.

E. It will be the CONTRACTOR's responsibility to supply water if there is none available on the site. Any costs associated with supplying water shall be the responsibility of the CONTRACTOR.

3.09 WARRANTY

A. The CONTRACTOR shall maintain a two (2) year, 85% care and replacement warranty on all plants.

B. The period of care and replacement shall begin after final inspection and approval of the initial installation of all plants and continue for two years, with two (2) potential plant replacement periods.

C. Plant replacements shall be performed in accordance with these specifications.

END OF SECTION
SECTION 02930

FINE GRADING, SEEDING AND SODDING

PART 1 - GENERAL

1.01 SCOPE OF WORK

A. This section includes seeding and sodding as required for restoration and restabilization of disturbed areas, and seeding and sodding outside of disturbed areas as directed by the Engineer, including preparation of seed and sod bed, fertilizer, lime, and mulch, in accordance with the Contract Documents.

1.02 SUBMITTALS

A. Submit certificates of compliance before delivery of materials for the following items:

1. Topsoil, seed, sod, fertilizer, lime and mulch.

1.03 CONSTRUCTION CRITERIA

A. Unless otherwise indicated, provide sod on those disturbed areas which supported a previously established stand of turf on slopes 3:1 and steeper, and where directed by the Engineer. Provide seeding on all other disturbed and filled areas.

1.04 REGULATIONS


B. Horticultural methods and standards as to size and quality shall conform to "USA Standard for Nursery Stock" of the American Association of Nurserymen, 1990 Edition.

C. Measurement and payment clauses contained in the referenced specifications will not apply on this project. Payment for all fine grading, seeding and sodding required as restoration or stabilization shall be paid for as incidental work of the appropriate pay item. Fine grading, seeding or sodding, as directed by the Engineer, outside the disturbed limits shall be paid for at a price per square yard to be negotiated with the Contractor at the time the work is directed.
PART 2 - PRODUCTS

2.01 TOPSOIL

A. Topsoil shall consist of fertile, agricultural soil capable of sustaining vigorous plant growth. It shall contain not less than 1-1/2 percent organic matter as determined by MSHA standard method of testing and shall have a pH value between 6.0 and 7.6.

1. Topsoil shall be free of roots, rubbish and other objectionable materials such as Bermuda Grass, Johnson Grass, Canada Thistle, Quack Grass, Poison Ivy and any material harmful to plant growth. Topsoil shall provide sufficient pore space to permit adequate root penetration.

C. Topsoil shall meet the following analysis as determined by the standard hydrometer test. Sand, silt, and clay are as defined in AASHTO M146.

<table>
<thead>
<tr>
<th></th>
<th>Min. Percent</th>
<th>Max. Present</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sand</td>
<td>30%</td>
<td>50%</td>
</tr>
<tr>
<td>Silt</td>
<td>30%</td>
<td>50%</td>
</tr>
<tr>
<td>Clay</td>
<td>5%</td>
<td>20%</td>
</tr>
<tr>
<td>Humus</td>
<td>3%</td>
<td>5%</td>
</tr>
</tbody>
</table>

D. Topsoil shall be used where indicated.

E. Materials available on site which meet the specified requirements may be utilized with the permission of the Engineer.

2.02 TURF SEED

A. Grass seed shall be Mix No. 1 in accordance with Table 1.66a of the Virginia Erosion and Sediment Control Handbook. The exact mixture ratio may vary according to the discretion of the Contractor. No seed or seed additives shall be supplied by anyone other than the Contractor. Seed which has become wet, moldy or otherwise damaged prior to seeding will not be acceptable.

2.03 FERTILIZER

A. Fertilizer shall be uniform in composition, free flowing and delivered to the site fully labeled according to applicable state fertilizer laws and shall bear the name trade name or trademark and warranty of the producer.

B. The Contractor may submit soil samples to an approved soils testing laboratory for fertilizing recommendations. Recommendations shall be submitted to and approved by the Engineer before implementation.
C. Otherwise, fertilize at the following rates:

1. Temporary Turf Seeding:
   a. Supply 10-10-10 fertilizer, or the equivalent, at the rate of 600 pounds per acre or 14 pounds per 1,000 square feet.

2. Permanent Turf Seeding:
   a. Supply 600 pounds of 10-10-10 fertilizer per acre with limestone. Immediately prior to seeding supply 400 pounds of 38-0-0 ureaform.

2.04 LIME

A. Lime shall be ground limestone containing at least 50 percent total oxides (calcium oxide plus magnesium oxide). Limestone shall be ground to a fineness that at least 50 percent will pass through a 100 mesh sieve and 98 percent will pass through a 20 mesh sieve.

B. Supply 70 pounds per 1,000 square feet (1-1/2 tons per acre) on sandy and silty soils or 100 pounds per 1,000 square feet (2.3 tons per acre) on clay or clay loam soils.

2.05 MULCH

A. Mulch for protection of permanent seeding shall conform to the following requirements:

1. Clean, weed free, unrotted straw (not less than 48 hours after mowing) shall be applied at a rate of not less than 70 pounds per 1,000 square feet (1 1/2 tons per acre) and shall be anchored with: mulch anchoring tool (flat slopes), mulch nettings, cut back and emulsified asphalt (five gallons per 1,000 square feet), Curasal (5 gallons per 1,000 square feet) Tera Tack II (20 gallons per 1,000 square feet), or Petroset (manufacturer's recommendations). On slopes 8 feet or more high, the rate of liquid binders shall be increased by 60%.

2. Mulch nettings, jute or excelsior blanket.

B. Mulch utilized as temporary protection and stabilization shall conform to the above materials requirements. Rate of application shall be as directed by the Engineer. Stone mulch will be permitted at the option of the Engineer.

C. Use either straw or cellulose wood fiber for landscaping.
PART 3 - EXECUTION

3.01 PERMANENT SEEDING

A. Harrow, disc, or otherwise loosen subsoil to a depth of four inches. Spread topsoil evenly over prepared subsoil to the following depths:

1. Slopes 3:1 or steeper, two inches after compaction.
2. Slopes flatter than 3:1, four inches after compaction.

B. Remove objectionable material such as stones, 1-1/2 inches or larger, clods, brush, roots, and trash from the top four inches of soil.

C. Apply lime and fertilizer at the rates specified in "PRODUCTS", and thoroughly mix into the top six inches. Scarify the area and rake until the surface is leveled to provide a maximum of two inches in variation, and the soil is friable and of uniform fine texture.

D. Immediately prior to seeding apply additional fertilizer at the rates specified in "PRODUCTS", and work into the top two inches of the soil.

E. Perform harrowing, discing, scarifying, and raking on the contour of slopes steeper than 3:1.

F. Moisten seedbed during periods of high temperatures and when directed by the Engineer.

G. Apply seed mixture uniformly with mechanical power driven seeders, mechanical cyclone hand seeders or hydroseeding equipment. (Slurry for hydroseeder may contain seed and fertilizer only).

H. Culipack or roll one inch into soil in floodplain areas. Rake, roll or drag the seedbed in all other areas, if hydroseeder or cyclone seeder is used.

I. Apply mulch, immediately after seeding, at the rates specified in "PRODUCTS".

J. Anchor mulch as specified.

3.02 TEMPORARY SEEDING

A. Loosen top two inches of seedbed.

B. Apply lime and fertilizer at the rates specified in "PRODUCTS".
C. Moisten seedbed during period of high temperature and when directed by the Engineer.

D. Apply seed mixture uniformly with mechanical power drawn seeders, mechanical cyclone hand seeders or hydroteeting equipment. (Slurry for hydroteeder may contain seed and fertilizer only).

E. Cultipack or roll seed one inch into soil in floodplain areas. Rake, or drag seedbed in all other areas, if hydroteeder or cyclone seeder is used.

F. Apply mulch, immediately after seeding, at the rates specified in "PRODUCTS".

G. Anchor mulch as specified.

3.03 MULCH ONLY

A. Perform grading as required. Place and anchor mulch only at the rates specified in "materials" where indicated and where directed by the Engineer.

3.04 TIME RESTRICTIONS

A. When permanent seeding or sodding is specified or directed, and seeding is not allowed because of time restrictions specified in "PRODUCTS", utilize one or more of the following methods to prevent erosion and sedimentation until such time as permanent seeding or sodding is allowed:

1. Place and anchor straw mulch or wood chips.

2. Apply temporary seeding.

3. Prepare soil as for permanent seeding and then mulch as specified; overseed during next seasonal seeding period.

4. Provide other erosion control measures acceptable to the Engineer and the sediment control inspector.

5. Remove straw or wood chips used as temporary mulch or work into subsoil to a minimum depth of six inches prior to initiation of permanent seeding application.

3.05 MAINTENANCE OF SEEDED AREAS

A. Maintain seeded and sodded areas until receipt of final acceptance.
B. Water seeded and sodded areas as necessary to maintain adequate moisture in the upper four inches of soil and keep mowed to a height of two to three inches; do not remove more than 1/3 of the grass leaf during initial mowing. Do not mow sod until it is firmly rooted.

C. Inspect seeded and sodded areas for failures and necessary repairs.

D. Provide replacements during the specified planting seasons.

E. If turf grass stand is inadequate as determined by the Engineer, overseed and fertilize using half of the rates originally applied, or resod.

F. If turf grass stand is over 60 percent damaged during a period of one year after final acceptance, as determined by the Engineer, reestablish following original seeding or sodding requirements.

END OF SECTION
SECTION 03300

CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.01 SCOPE OF WORK

A. This section specifies labor, materials, equipment and services necessary for and reasonably incidental to the furnishing and installation complete of all cast-in-place concrete.

1.02 QUALITY ASSURANCE

A. Concrete work shall conform to the requirements and provisions of the latest editions of the following publications. In the ACI publications referred to herein, the advisory provisions shall be considered mandatory, as though the work “shall” has been substituted for “should” wherever it appears.

B. American Concrete Institute (ACI)

1. ACI 301-96 - Specifications for Structural Concrete
2. ACI 301.1R-89 - Guide for Concrete Floor and Slab Construction
4. ACI 305R-91 - Hot Weather Concreting.
5. ACI 306R-88 - Cold Weather Concreting.
6. ACI 309R-87 – “Guide for Consolidation of Concrete”.
7. ACI 318-95 – “Building Code Requirements for Structural Concrete and Commentary”.
8. ACI 350R-89 – “Environmental Engineering Concrete Structures”.

C. ASTM

1. ASTM C31-91 – “Test Methods of Making and Curing Concrete Test Specimens in the Field”.
2. ASTM C33-93 - Specification for Concrete Aggregate.
4. ASTM C143-90a - Test Method for Slump of Portland Cement Concrete.
8. ASTM C231-91b - Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method.

1.03 FIELD QUALITY CONTROL AND CONCRETE TESTING

A. Independent Testing Laboratory: The Contractor shall employ at his own expense an independent testing laboratory, approved by the Engineer, to perform the inspection and testing services specified in ACI 301, Chapter 16, Testing.

B. Test Specimens: In addition to the above, the Contractor shall supply all concrete, compression test molds, tamping rods, trowel, metal or glass covers, slump cone, storage box and sand necessary for making test specimens as outlined herein. The Contractor shall make, cure, and remove from molds and transport to the testing laboratory, three specimens for each sample in accordance with ASTM C172 and C31.

C. Extent of Tests: Prepare one sample for strength testing for each 100 cu. yds., or fraction thereof, for each mixture design of concrete placed in any one day.

D. Test Reports: Contractor shall fill in data on concrete test sample form and forward same with test specimens to the testing laboratory. When tests have been conducted, the contractor shall furnish the results of the tests with all pertinent data to the Engineer.

E. Deficiencies and Remedial Action: In the event that concrete strength test results do not meet the acceptance criteria specified in ACI 301, additional tests of concrete in place as specified in ACI 301 shall be performed at the sole expense of the Contractor. In the event that tests of concrete in place do not meet the acceptance criteria specified in ACI 301, those portions of the structure affected as determined by the Engineer shall be removed and replaced in a manner acceptable to the Engineer at no additional expense to the Owner.

F. Slump Test: The Contractor shall also check the consistency of concrete by means of slump tests conducted in accordance with ASTM C143. The slump tests shall be made at the same time that the compression test specimens are made or as directed by the Engineer.
G. Air Content Test: The Contractor shall also test the air content in accordance with ASTM C231. The air content test shall be made at the same time that the compression test specimens are made or as directed by the Engineer.

H. Supervision of Tests: The making of all concrete specimens, slump, and air content. Tests shall be witnessed by the Engineer.

1.04 SUBMITTALS

A. Design Mix: At least 31 days prior to start of placing concrete, submit design mix for concrete, indicating that the concrete ingredients and proportions will result in a concrete mix meeting requirements specified.

B. Hot and Cold Weather Concreting: submit proposed methods for compliance with cold and hot weather mixing and delivery recommendation of ACI 305R and ACI 306R.

C. Certificates:

1. Submit with each mix design, laboratory test reports and manufacture’s certificates attesting to conformance of ingredients with specifications. Include 28 day compressive strength test certifying compliance with the requirements herein.

2. In case the source, brand or characteristic properties of the ingredients need to be varied during the term of the Contract, submit revised design mix and manufacturer’s certificates.

3. Submit certificate stating that each admixture used in identical in composition to the sample used for acceptance testing and is compatible with all other materials in the design mix.

4. Submit certificate stating that the concrete vibrator operators have the required experience in operating the equipment.

D. Batch Tickets: Submit a delivery ticket from the concrete supplier with each batch delivered to the site setting forth the following information:

1. Name of supplier;
2. Name of batching plant and location;
3. Serial number of ticket;
4. Date;
5. Truck number and batch number;
6. Specific job designation;
7. Volume of concrete (cubic yards);
8. Specific class of concrete;
9. Time loaded and amount of water added;
10. Type and brand of cement;
11. Weight of cement;
12. Maximum size of aggregates;
13. Weights of coarse and fine aggregates, respectively;
14. Type and amount of admixtures; and
15. Mix design designation.

E. Manufactures’s Data: Submit manufacturer’s data with installation instructions for all materials, including but not limited to, admixtures, curing compound and materials, coatings, waterstops, vapor barrier and joint materials.

F. All submittals shall state the location(s) and application(s) for each material.

1.05 GENERAL REQUIREMENTS

A. Concrete work shall conform to the applicable requirements of ACI 301, except as modified herein.

PART 2 - PRODUCTS

2.01 CONCRETE

A. Concrete for Thrust Blocks:

<table>
<thead>
<tr>
<th>28 Day Compressive Strength (psi)</th>
<th>Aggregate Size Number</th>
<th>Minimum Cement Content (lbs/CY)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3,000</td>
<td>57</td>
<td>611</td>
</tr>
</tbody>
</table>

B. Concrete for Piping:

1. Refer to specification sections 02600 and 02610.

C. Concrete for Any Other Use:

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<thead>
<tr>
<th>28 Day Compressive Strength (psi)</th>
<th>Aggregate Size Number</th>
<th>Minimum Cement Content (lbs/CY)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4,000</td>
<td>57</td>
<td>611</td>
</tr>
</tbody>
</table>

C. Provide air-entrained concrete with air content - 6 percent plus or minus 1 percent for concrete exposed to weather.
D. Maximum water cement ratio of 0.45.

E. Maintain the slump range for concrete at the point of delivery within the following limits:

1. Concrete flatwork and incidental construction  2-3 inches
2. All Other 2-4 inches

2.02 MATERIALS

A. Cement: ASTM C150, Type II or II A. For exposed concrete use one manufacturer of cement.

B. Admixtures and Additives:

2. Water Reducing and Retarding Admixtures: ASTM C494, Type D.
3. Water Reducing Admixture: ASTM C494, Type A.
4. Concrete aggregates: ASTM C33. Aggregate may be crushed stone, natural or manufactured sand. Uniformity of grading and moisture content shall be obtained by methods recommended in ACI 304.
5. The use of anti-freeze compounds, salts, chemicals or other foreign materials, for the purpose of lowering the freezing point of the concrete is prohibited. No calcium chloride or ingredients containing chloride shall be mixed in any concrete.
6. Admixtures used in concrete to receive surface hardener shall be compatible and approved for use by the surface hardener manufacturer.

C. Water used in mixing concrete shall be clean and free from injurious amount of oil, acids, alkalis, organic materials or other deleterious substances.

D. Curing or Curing and Hardening Compounds: ASTM C309, Type I-D.

E. Sheet Materials for Curing Concrete: ASTM C171.

F. Flexible Joint Sealant: Two-component waterproof material that bonds securely to clean concrete surfaces. SikaFlex-2C NS/SL as manufactured by Sika Corporation or FX-570 and FX-571 as manufactured by Fox Industries.

H. Waterstops shall be PVC type, U.S. Corps of Engineers specification CRD-572. No reclaimed material shall be used in the manufacturing of waterstop. Waterstops at expansion joints shall be the three bulb type. Bulb rings and bulb ring pliers shall be as manufactured by Williams Products, Inc.

I. Non-Shrink Grout: Non-shrink, non-metallic conforming to the requirements of U.S. Corps of Engineers specification CRD-C621. Mix and place according to the manufacturer’s recommendations.

J. Bonding Compound: A three-component, water-based, epoxy-resin Portland cement bonding compound shall be applied to the existing cleaned concrete prior to pouring new concrete. The bonding system shall be Sikadur Armatec 110 as manufactured by Sika Chemical Corporation or approved equal.

PART 3 - EXECUTION

3.01 PREPARATION OF EQUIPMENT AND PLACE OF DEPOSIT

A. Before placing concrete, all equipment for mixing and transporting the concrete shall be cleaned; all debris and ice shall be removed from places to be occupied by the concrete; forms shall be thoroughly oiled and the reinforcement shall be thoroughly cleaned of ice or other non-specified coatings.

B. Excess water shall be removed from place of deposit before concrete is placed, unless otherwise permitted by the Engineer.

C. Before placing any concrete, the Contractor shall install all reinforcement, sleeves, anchors, fittings, pipes, conduits, etc., called for or required by the provisions of other sections of these specifications or noted on the drawings. No concrete shall be placed until this work has been approved by the Engineer.

3.02 READY-MIXED CONCRETE

A. Ready-mixed concrete shall be in conformance with ASTM C94.

B. The volume of any batch mixed shall not exceed the manufacturer’s rated capacity of the mixer used.

C. Mixing time shall be as specified in ASTM C94, but during hot weather or other conditions contributing to quick stiffening of concrete, the Engineer may require the
Contractor to limit the discharge time to LESS than one hour or 300 revolutions of the mixer, whichever comes first.

D. No materials for a batch of concrete shall be placed in the drum of a mixer until all of the previous batch has been discharged. Mixers shall be kept free and clean of accumulations of hardened concrete and any incrustations of inert materials.

E. The effective moisture contained in the aggregate shall be included in the total amount of mixing water used. In the absence of a field determination of the moisture content of the aggregates, the following shall be assumed: fine aggregate, 2 gallon per cubic foot and coarse aggregate 1/4 gallon per cubic foot. The quantity of mixing water to be used shall include the moisture in the aggregates above the state of saturated and surface dry.

F. Water shall not be added to the mix after departure from the batching plant without the Engineer’s permission. In no case shall the maximum water cement ratio be exceeded.

G. If it becomes necessary to mix a small portion of concrete by hand, permission shall be obtained from the Engineer. In that case, if allowed, the total quantity of such batches shall not exceed 2 cubic yard. The materials shall be accurately measured and shall be mixed dry in a watertight, metal mortar box in order to prevent loss of cement. Mixing on the bare ground or on floors of buildings will not be permitted under any circumstances. The mass shall be thoroughly turned over at least 6 times, water being added after the third time.

3.03 CONVEYING

A. Handle concrete from the mixer to the place of final deposit as rapidly as practicable by methods that will prevent segregation, undue drying or temperature rise, or loss of ingredients, and in a manner that will maintain the required quality of concrete.

B. Use conveying equipment of size and design to maintain a continuous flow of concrete at the delivery end, and as approved by the Engineer. Do not use conveying equipment with aluminum parts, such as chutes, hoppers, or scrapers, that could come in contact with and contaminate the concrete during conveying.

C. Use belt conveyors which are horizontal or at a slope which will cause neither segregation nor loss. Use an approved arrangement at the discharge end to prevent separation. Discharge long runs without separation into hopper. Do not allow concrete to adhere to the return belt.

D. Use chutes which are metal or metal lined, and have a slope not exceeding one vertical to two horizontal and not less than one vertical to three horizontal. Chutes
more than 20 feet long, and chutes not satisfying slope requirements, may be used if the chutes discharge into an approved hopper before distribution.

E. Use pumping and pneumatic conveying equipment of a suitable kind with adequate pumping capacity. Clean equipment at the end of each operation. Control pneumatic placement so that separation is not apparent in the discharged concrete.

3.04 PLACEMENT

A. General:

1. Placing on Ground or Subcourse: Subgrade or base course shall be free from injurious material, well drained, and moist at time of concreting. Prior to placing concrete, thoroughly clean and dampen as necessary leaving no free water standing on base course or subgrade and no soft or muddy spots in subgrade.

2. Deposit concrete into the forms as nearly as practical to its final position, and in a manner not to cause or permit segregation. Do not use vibrators for extensive shifting of the mass of fresh concrete. The free drop of any concrete shall not exceed three feet without the use of adjustable length pipes. Place concrete for columns by means of pipes adjustable in length and not less than six inches in diameter.

3. Layers of concrete shall not be tapered off in wedge shaped slopes but shall be built with squared ends and level tops. Deposit concrete continuously or in layers of such thickness that no concrete will be deposited on concrete which has hardened sufficiently to cause the formation of seams or planes of weakness within the section. If a section cannot be placed continuously, locate construction joints at points as indicated or as approved. Place concrete at such a rate that all concrete being integrated with fresh concrete is plastic.

4. Align slab top surfaces to screed contours by strike off, or if the nature of the finished surface so requires, by approved vibrating screeds or roller pipe screeds.

5. Do not place concrete in supported elements until concrete previously placed in supporting columns and walls is no longer plastic, or where so indicated, until initial shrinkage has occurred in such supporting concrete members (2 hours minimum).

B. Consolidation: Consolidate concrete in accordance with ACI 309R. Consolidate concrete by means of approved internal vibrators. The vibrator operators shall be experienced in operating the equipment for a minimum of three years.
1. Employ a sufficient number of vibrators to consolidate the incoming concrete to a proper degree within 15 minutes after depositing in forms. In all cases, maintain at least one spare vibrator available at the site of any structure during concrete placement. Do not vibrate the forms or the reinforcing steel.

2. The location, manner and duration of the application of vibrators shall be such as to secure maximum consolidation of the concrete without causing segregation of mortar and coarse aggregate and without causing water or cement paste to flush to the surface. The thickness of the layers shall be not greater than can be satisfactorily consolidated by vibrators. Vibrators shall vertically penetrate a few inches into the previous lift at regular intervals.

3. The use of approved external vibrators for consolidating concrete will be permitted when concrete is inaccessible for adequate consolidation providing the forms are constructed sufficiently rigid to resist displacements and damage from external vibration.

3.05 FINISHING CONCRETE

A. Immediately following removal of forms, cavities produced by form ties and other surface defects shall be repaired in accordance with Chapter 9 of ACI 301 and as specified hereinafter.

B. Finish of formed surfaces shall be in accordance with Chapter 10 of ACI 301 as follows:

1. All concrete surfaces below grade and not exposed to view shall be given a rough form finish.

2. All concrete surfaces exposed to view shall be given a smooth rubbed finish. Abrupt irregularities like fins or offsets shall not be acceptable.

C. Finish of flatwork shall be in accordance with Chapter 11 of ACI 301 and as follows:

1. Flatwork shall be given a troweled finish, except that flatwork which will be the final working surface and is exposed to weather shall be given a broom or belt finish.

3.06 CURING AND PROTECTION

A. General Requirements:
1. Protect freshly placed concrete from excessively hot or cold temperatures. Maintain without drying for the period of time necessary for the hydration of the cement and the proper hardening of the concrete.

2. Keep concrete continuously under cure until the accumulated time during which the temperature of the air in direct contact with the concrete has been warmer than 50 degrees F for at least seven (7) days.

B. Normal Curing: Use any one of the methods described below.

1. Ponding: Keep the surface submerged at all times for the required curing period. Water temperature shall not be less than 20 degrees F below concrete temperature.

2. Continuous Application of Water: Accomplished by sprinkling with a nozzle which so atomizes the flow that a mist and not a spray is formed until the concrete is set.

3. Covering: Cover the entire area to be cured with double thickness burlap sheet, laid directly on the concrete, and keep continuously wet.

4. Covering with Waterproof Sheet: Keep the entire area to be cured continuously wet by sprinkling, as specified in paragraph 2 above, for at least 18 hours and then immediately cover with waterproof curing sheet, free of holes or tears.

C. Curing Compound Method:

1. Curing and hardening compound shall be applied to exposed slabs which do not receive any other surface treatment. Curing compounds shall be applied on all other surfaces.

2. Do not apply the curing compound to the surface of construction joints, to reinforcing steel, or to surfaces which receive cementitious toppings. Do not apply the curing compound to surfaces which receive specialty coatings, including but not limited to; surface hardeners, non-slip finishes and waterproofing compounds; unless written approval of such usage is first obtained from the specialty coating manufacturer.

3. Keep surfaces to be cured moist or wet until the curing compound is applied. Do not apply the curing compound until all patching and surface finishing has been completed.

4. Apply curing compound uniformly over the surface at the rate and thickness recommended by the manufacturer, or if not stipulated, at 200 SF per gallon.
Curing compound which becomes chilled to such an extent that it is too viscous for satisfactory application shall be warmed in accordance with the manufacturer’s recommendations.

5. Should the film of compound be damaged from any cause before the expiration of the curing period, immediately repair the damaged portions with additional compound.

D. Inclement Weather Protection:

1. When the mean daily temperature of the atmosphere is less than 40 degrees F., maintain the temperature of the concrete between 50 and 70 degrees F when placed and for the required curing period.

2. When necessary, make arrangements for heating, cooling, insulating or housing in advance of placement, adequate to maintain the required temperature and moisture conditions without injury due to concentration of heat.

3. Do not place concrete on frozen ground nor in contact with ice within the forms. Protect concrete from freezing for a period of five days after placing.

4. Stop placing concrete when the quantity of rain falling on the surface is sufficient to wash the concrete surface.

5. Concrete shall have a maximum placing temperature which will not cause difficulty from loss of slump, flash set, or cold joints.

6. The temperature of concrete as placed shall not exceed 90 degrees F except that the temperature of concrete placed in walls and slabs three feet or greater in thickness shall not exceed 85 degrees F. When the temperature of the steel is greater than 120 degrees F, embedded items shall be sprayed with water immediately prior to placing concrete.

7. Details and methods of placing and handling concrete during inclement weather shall be in accordance with ACI 305R or ACI 306R as applicable.

### 3.07 CONSTRUCTION JOINTS

A. Construction joints shall be as indicated on the Contract Drawings. If not indicated, the location of construction joint shall be determined by the Contractor. In such instances, the maximum horizontal distance between joints shall be 35 feet and maximum vertical distance shall be 12 feet. Joints not indicated shall be made and located so as not to impair the strength of the structure, shall not impair appearance
when subject to public view, and shall be approved in writing by the Resident Engineer prior to their use.

B. Provide vertical keys at all joints in walls unless otherwise indicated. Other construction joints shall be made without keys unless indicated otherwise. Where keys are indicated, keyways shall be formed to dimensions indicated on the Drawings. If not indicated keys shall be 2" nominal depth and the width shall be equal to or less than one-third the concrete thickness in nominal 2" increments.

C. Where keys are not indicated, and where expansion joint filler or bond breaking compound are not required, provide a roughened concrete surface by exposing at least 3/8 inches depth of clean coarse aggregate by one of the following methods:

1. Use an approved chemical retarder which delays but does not prevent setting of the surface mortar. Remove retarded mortar within 24 hours after placing to produce a clean exposed coarse aggregate.

2. Clean hardened concrete surfaces by abrasive blast method to expose clean coarse aggregate after the curing period or immediately before placing concrete.

3. Surfaces of concrete which have been in place less than eight hours may be cleaned with air and water jets if surface laitance is removed and clean coarse aggregate is exposed to required depth.

D. Before placement of fresh concrete, clean reinforcing steel and the surfaces of horizontal and vertical construction joints of surface laitance, curing compound, and other materials foreign to the concrete. Moisten surfaces on which concrete is to be placed with water immediately before placing concrete.

E. Surfaces of horizontal construction joints, where expansion joint filler or bond breaking compound is to be placed as indicated, shall be cleaned of dirt, sawdust and other loose material.

F. When it is necessary to make a construction joint because of an emergency, furnish and place additional reinforcing steel across the joint as required at no additional expense to the Owner.

G. Concrete slabs and walls shall be poured between indicated joints allowing a minimum period of 3 days to elapse between adjacent pours.

3.08 EXPANSION AND CONTRACTION JOINTS

A. No reinforcement or other fixed metal items shall be run continuous through expansion and contraction joints.
B. Construct open joints at the locations indicated, by means of a wood strip, metal plate, or other approved material to be subsequently removed.

C. Install flexible joint sealant in accordance with the manufacturer’s recommendations and the following:

1. Sealant shall not be placed until 28 days after concrete is placed.
2. Wire brush and water blast clean joints prior to applying primer and sealant.
3. Apply primer to walls of joint.
4. Tool sealant into joint to have a slightly concave surface. Maximum depth of sealant shall be 2 inch. Eliminate voids or bubbles, and create a clean and neat appearance.
5. Allow 3 day cure before subjecting sealant to total water immersion.

3.09 DEFECTIVE CONCRETE WORK

A. Porous areas, open or porous construction joints and honeycombed concrete will be considered to indicate that the requirements for mixing, placing and handling have not been complied with and will be sufficient cause for rejection of the members of the structure thus affected.

B. Defective work shall be entirely removed within forty-eight hours after the defects have been determined.

C. Defective concrete areas not repaired within forty-eight hours after removal of forms shall be patched with polymer-modified mortars approved by the Engineer and completed by an approved applicator.

D. Repaired areas will not be accepted if:

1. The structural requirements have been impaired by reducing the net section of compression members;
2. The bond between the steel and concrete has been reduced; and
3. The area is not finished to conform to in every respect to the texture, contour and color of the surrounding concrete.
E. If the above requirements are not satisfied, the Engineer may require that the members or unit involved be entirely removed and satisfactorily replaced at no additional expense to the owner.

END OF SECTION
SECTION 03400

SANITARY SEWER MANHOLES

PART 1 - GENERAL

1.01 DESCRIPTION

A. This section includes the furnishing of all plant labor, equipment, appliances, and materials and in performing all operations in connection with the construction of manholes complete, in strict accordance with this section of specifications and the applicable standard details.

B. All manholes shall be precast concrete or polymer concrete unless otherwise noted on the plans and approved by the Engineer. All manholes and appurtenances must comply with the most current edition of Spotsylvania County Standards.

1.02 APPLICABLE STANDARDS

C. Corps of Engineers CRD-588.

PART 2 - PRODUCTS

2.01 PRECAST SECTIONS

A. Precast manhole sections shall be manufactured in accordance with current ASTM Standard C 476 and C 478. Each section shall have not more than two holes for the purpose of handling and laying. These holes shall be tapered and shall be plugged with rubber stoppers and mortar after installation is made water-tight. Joints of the manhole sections shall be formed entirely of concrete employing a round rubber gasket and when assembled shall be self-centering and make a uniform water-tight joint. Except for these surfaces within the gasket groove, all inside surfaces of the bell or outside surfaces of the spigot, or both, on which the rubber gasket may bear during the closure of the joint and at any degree of partial closure shall be parallel within one (1) degree and have an angle of not more than two (2) degrees with the longitudinal axis of the pipe. In joints formed entirely of concrete, the distance from either side of the gasket to the end of the bell of spigot shall not be less than 3/4 inch. The gasket spaces between the bell and spigot shall be so shaped as to provide either grooves or shoulders that will prevent the gasket from disengaging from its compression surface or being blown out by hydrostatic pressures. The gasket shall be the sole element utilized in sealing the joint from either internal or external hydrostatic pressure. Joints between precast manhole pipe sections shall be rubber “O” ring type conforming to the latest edition of ASTM C-361 unless otherwise
specified.

B. Doghouse manholes are not permitted. Manholes to be built over existing lines shall be constructed as shown on cut-in manhole detail on plans.

C. Refer to Section 03410 for design and strength requirements.

2.02 FRAMES AND COVERS

A. Manhole frames and covers shall be molded of gray cast iron conforming to ASTM A48, Class 30. Castings shall be coated with a coal tar pitch varnish, to which sufficient oil has been added to make a smooth coating, tough and tenacious when cold, but not tacky or brittle. Seating surfaces between frame and cover shall be machined. The dimensions and weights shall conform to the requirements shown on the Contract Documents. The word “SEWER” shall be cast into the cover.

B. Watertight manhole frame and covers are required on all manholes shown with a vent assembly on the Contract Drawings or designated as “WT”.

C. Manhole frames shall have a 24-inch diameter clear opening for all manholes.

D. 24-inch watertight manhole frame and covers shall be East Jordan Iron Works #00194412 Manhole Frame for Watertight Cover #00194441 Watertight Manhole Cover or Capitol Foundry MH-1682WT.

E. 24-inch standard manhole frame and covers shall be East Jordan Iron Works #00194410 Manhole Frame for Standard Cover #00194443 Standard Manhole Cover or Capitol Foundry MH-46821.

F. 24-inch flat top manhole frame and covers shall be East Jordan Iron Works #00245010 Manhole Frame and #00104175 Cover, or approved equal.

G. Sealant for manhole frames shall be a one-component polyurethane sealant similar to Sika “Sikaflex” type 430. Sealant for flexible pipe connections shall be a two-component polysulfide sealant similar to Sika “Sikaflex” type 412 with primer type 419.

H. Manhole frames shall be secured to the manhole with Heat Shrink Seal, Rapid Seal, or equivalent.

2.03 APPURTENANCES

A. A flexible seal shall be provided for all pipe connections to structures and manholes. The pipe to manhole seal will be A-Lok or Kor-n-Seal gasket per ASTM C443 cast integrally in manhole wall and located as required. The gasket will be designed to
meet test and performance requirements of ASTM C923 and to permit 10° omni-directional deflection.

B. Stoppers shall be water-tight and of an approved design as furnished by the pipe manufacturer.

C. Jointing mastic shall be an elastic, water resistant formulation of plastic bituminous materials and inert fillers so combined that when applied to a vertical metal surface and heated to 120 degrees F, the jointing mastic will neither slump nor lose plasticity. When applied directly from the container without further fixing, the jointing mastic can be applied in an even, adherent coat within the temperature range of 20 degrees to 100 degrees F.

D. Quick setting non-shrink grout shall conform to requirements of Corps of Engineers CRD-588, octocrete, speedcrete or approved equal.

E. Flexible plastic gasket between manhole and manhole frame shall be extruded rope type B, in accordance with AASHTO M-198, butyle based, 3/4 inch diameter minimum.

F. Expansion joint filler shall be Type 1 in accordance with ASTM-1752.

G. Sanitary sewer vents shall be provided where shown on the plans.

**PART 3 - EXECUTION**

**3.01 INVERT CHANNELS**

A. Invert channels shall be smooth and semicircular in shape conforming to the inside of the adjacent sewer section. Changes in direction of flow shall be made with a smooth curve of as large a radius as the size of the junction structure will permit.

B. Changes in size and grade of the channels shall be made gradually and evenly. The bench of the junction structure outside the channels shall be smooth and shall slope toward the channels at 1-inch: 1’ minimum. The invert channel is to be at least 0.8 times the diameter of the pipe depth.

B. Invert channels are not required for tee.

**3.02 WATER-TIGHT WORK REQUIRED**

A. Manholes shall be completely water-tight. All leaks shall be repaired immediately with a non-shrink material, or the entire work removed and rebuilt. Ground water must be kept below all parts of the masonry or concrete foundations and walls until
the mortar and concrete has obtained an adequate set.

B. Refer to specification Section 07135 for additional waterproofing requirements.

3.03 CONNECTING TO EXISTING MANHOLES

A. When sewer line construction includes connection to an existing or active structure or manhole, the sewer line shall be securely plugged water-tight in a manner satisfactory to the inspector as soon as the pipeline stub has been installed in the manhole. This plug shall be maintained in a water-tight condition throughout the construction of the new sewer system until the system has been completed and the Contractor has been instructed by the Owner to place the system in operation. The sewer shall be plugged in such a manner that the plug can be removed for testing of the sewer. When the pressure tests have been completed, the plug shall be replaced and maintained as set forth above until the new sewer line is placed in service.

B. Connections shall be made by core or saw cutting methods. No sledge hammering or jack hammering of piping or manholes is permitted without prior authorization by the Engineer.

3.04 MANHOLE TESTING

A. All manholes will be tested using the negative air pressure test (vacuum) in accordance with ASTM C1244, latest edition, for water tightness. Manholes will be visually inspected after backfilling. Contractor may backfill before testing with the understanding that any repairs will be made from the exterior of the manhole.

Manholes shall be vacuum tested and shall have 10” of mercury applied to the manhole and the time measured for the vacuum to drop from 10” to 9” of mercury. Minimum allowable test times for manhole acceptance at the specified vacuum drop.

<table>
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<tr>
<th>Depth of Manhole (Feet)</th>
<th>Manhole Diameter (Inches)</th>
<th>Test Time (Seconds)</th>
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<tbody>
<tr>
<td></td>
<td>48”</td>
<td>60”</td>
</tr>
<tr>
<td>10’ or less</td>
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<tr>
<td>Greater than 10’ but less than 15’</td>
<td>60</td>
<td>75</td>
</tr>
<tr>
<td>Greater than 15’ but less than 25’</td>
<td>75</td>
<td>90</td>
</tr>
<tr>
<td>25’ and greater</td>
<td>90</td>
<td>105</td>
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</tbody>
</table>

b. Note: The times listed above are more stringent than ASTM C 1244 requirements.

c. Test times for structures other than manholes and diameters listed will be based on the times for manholes of the nearest equivalent
volume or as directed by the Inspector or Engineer.

B. Test for leakage of gravity sewers (greater than 42” diameter) using either the infiltration or exfiltration test:

1. Ground Water Determination: Use same procedure as “low pressure air test” above.

2. Use infiltration test when ground water is 4 feet or higher above pipe crown along entire length of line to be tested. Plug the pipe at the upstream manhole. Install suitable measuring device at the downstream manhole. Measure the amount of water flowing through the outlet after flow has stabilized for a period of one (1) hour minimum. Test period shall be at least 15 minutes and not more than one (1) hour. The flow measuring device must be accurate within the flow rate expected for the test duration. Allowable leakage shall be 50 gallons per inch of pipe diameter per mile per 24 hours.

3. Exfiltration test shall be accomplished by plugging the sewer at the downstream end and filling the upstream manhole with water to the top of the manhole. Test period shall be a minimum of two (2) hours. Allowable leakage shall be 50 gallons per inch of pipe diameter per mile per 24 hours.

END OF SECTION
SECTION 03410

PRECAST CONCRETE STRUCTURES

PART 1 - GENERAL

1.01 DESCRIPTION

A. The Contractor shall provide all labor, materials, tools and equipment necessary for the furnishing and installing of all precast concrete units as shown on the drawings and herein specified.

B. Precast concrete work shall be supplied by a firm with a minimum of three years of continuous operations and which has performed at least three representative jobs, three years or older, comparable to precast work to be provided for this project.

1.02 RELATED WORK DESCRIBED ELSEWHERE

A. Section 02200 – Earthwork, Excavation, Trenching and Backfilling.
B. Section 02223 – Vibration Control
C. Section 03300 – Cast-in-Place Concrete

1.03 QUALITY ASSURANCE

A. All work related to Precast Concrete Structures shall conform to the requirements and provisions of the latest editions of the following publications:

1. American Concrete Institute (ACI)
   a. ACI 301-96 - “Specification for Structural Concrete”.
   b. ACI 318-95 - “Building Code Requirements for Structural Concrete and Commentary”

B. ASTM

4. ASTM C890-91 - “Practice for Minimum Structural Design Loading for Monolithic or Sectional Precast Concrete Water or Wastewater Structures”

5. ASTM C923-94 - “Specification for Resilient Connectors Between Reinforced Concrete Manhole Structures, Pipes, and Laterals.”

1.04 DESIGN REQUIREMENTS

A. Structural design for precast units shall be prepared by a registered Professional Engineer licensed in the Commonwealth of Virginia for the precast concrete manufacturer.

B. Distribution of earth loading and live load shall be in accordance with ASTM C857-87, or ASTM C890-91. Design vertical live load shall be AASHTO HS20 – 44 and shall not be less than 300 lbs/sq. ft.

C. The precast units shall be designed for flotation with the water level at the ground surface. The units shall also be designed to resist all stresses encountered during casting, handling, transportation and erection.

D. Concrete design shall be in accordance with ACI 318-95. All design and testing shall be under the supervision of a registered Professional Engineer.

1.05 SUBMITTALS

A. Shop drawings and design calculations shall be submitted for approval. The calculations shall be prepared for the units which are being submitted for approval. Calculations not prepared for this project shall be rejected. The drawings shall be fully dimensioned and shall show all opening reinforcing steel details, joint details, lifting and erection inserts. Fabrication shall not commence until the Engineer has approved the layout, design and dimensions of the drawings.

B. Calculations shall be certified to meet all contract drawings and specification requirements and to meet the standards herein specified.

1.06 FABRICATION

A. The precast units shall be factory cast. Job site casting will not be permitted. Concrete in the precast elements shall be continuously placed to prevent formation of seams. The finished units shall be free of voids, cracks and have beveled corners and edges. All inserts shall be securely attached or embedded in their proper location.

B. Concrete strength of all precast units at 28 days shall be 5,000 psi minimum. It shall be the precast unit manufacturer’s responsibility to insure that the specified strength is maintained throughout production of the units. Mix designs shall be those
previously used by the manufacturer which have proven satisfactory for casting units similar to those specified and producing the required strength. All precast concrete shall be air entrained. Concrete shall not contain water soluble chloride ions.

C. Precast concrete units shall be manufactured in accordance with the applicable requirements of ASTM C858-83 (1990), “Underground Precast Concrete Utility Structures”, or ASTM C478-97, “Precast Reinforced Concrete Manhole Sections”, and as modified herein.

D. Wall sleeves for piping, sump, steps, access hatch and other inserts as shown on the drawings, and specified, shall be cast into the structure at the place of manufacture.

1.07 INSPECTION AND CERTIFICATION

A. Certification requirements shall be in accordance with ASTM C858-83 (1990). Copies of all certificates shall be available to the Engineer upon request.

B. The Engineer shall be allowed into the casting plant at any time to inspect the fabrication of units for this project.

PART 2 - PRODUCTS

2.01 GENERAL

A. Materials shall be in accordance with ASTM C858-83 (1990), or ASTM C478-97, with Type I cement.

B. Joint sealing material shall be performed, flexible joint sealing compound to ASTM C923-94.

PART 3 - EXECUTION

3.01 PRODUCT HANDLING

A. Precast sections shall be transported and handled with proper equipment to protect the elements from damage. Sections shall be handled by means of lifting inserts embedded in the concrete. Damaged sections that cannot be satisfactorily repaired shall be replaced by new sections at no additional cost to the Owner.

3.02 INSTALLATION

A. Precast units shall be provided as shown on the drawings. Precast concrete sections shall be set so as to be vertical and with sections in true alignment with a 1/4 inch maximum tolerance to be allowed. The Contractor shall install the precast sections
with joint sealing compound in a manner that will result in a watertight joint. Backfilling shall be done in a careful manner, bringing the fill up evenly on all sides.

END OF SECTION
SECTION 05500

METAL FABRICATIONS

PART 1. GENERAL

1.01 DESCRIPTION

A. This Section includes specifications for all labor, materials, equipment and services necessary for, and incidental to, the furnishing and installation, complete, of all miscellaneous metal work shown on the Drawings and as herein specified.

B. Anchors, fastenings, accessories and incidentals that are required and are to be built into the work shall be furnished.

1.02 MISCELLANEOUS ITEMS

A. All items shall be of sizes and shapes and constructed of materials as indicated on the Drawing or specified. Items furnished, unless otherwise specified, shall be the manufacturer's standard approved products and shall be fabricated in accordance with the best shop methods. The Contractor shall verify all measurements and shall take all other measurements necessary before fabrication. Shearing and punching shall leave clean, true lines and surfaces. Permanent steel connections shall be welded or bolted with high tensile bolts. Curved work shall be evenly sprung. Castings shall be sound and free from warp holes and other defects that impair their strength or appearance. Castings shall be made in as large sections as practicable, with jointing made where least conspicuous. Exposed surfaces shall have a smooth finish and sharp well-defined lines and arises. Thickness of metal and details of assembly and supports shall give ample strength and stiffness. Galvanized steel items shall be hot-dip zinc coated after fabrication. Unless otherwise shown, all exposed fastenings shall be of the same material, color and finish as the metal to which applied. Holes and connections for the work of other trades shall be provided. At the proper time, built-in items to be incorporated into the structures shall be delivered and set in place.

B. Members shall be framed in substantial manner and all details connections and fastenings shall be in accordance with the best accepted practice, and shall be subject to the approval of the Owner Representative.

1.03 QUALITY ASSURANCE

A. Field Measurements: Take field measurements prior to preparation of shop drawings and fabrication where possible. Do not delay job progress; allow trimming and fitting where taking field measurements before fabrication might delay work.
B. Shop Assembly: Preassemble items in shop to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation.

C. Structural steel fabrication and erection shall conform to the requirements of the latest editions of following publications:


D. Aluminum fabrication and erection shall conform to the latest editions of the following publications:


E. The following ASTM Standards shall be adhered to for materials and Practices:

1. ASTM A36 - "Specification for Structural Steel".
2. ASTM A53 - "Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless".
4. ASTM A153 - "Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware".
5. ASTM A193 - "Specification for Alloy-Steel and Stainless Steel Bolting Materials for High-Temperature Service".
6. ASTM A194 - "Specifications for carbon and Alloy Steel Nuts for Bolts for High-Pressure and High Temperature Service".
7. ASTM A242 - "Specification for High-Strength Low-Alloy Structural Steel".
8. ASTM A276 - "Specification for Stainless and Heat-Resisting Steel Bars and Shapes".
10. ASTM A307 - "Specification for Carbon Steel Bolts and Studs, 60,000 psi Tensile".
11. ASTM A320 - "Specification for Alloys-Steel Bolting Materials for Low-Temperature Service".
12. ASTM A325 - "Specification for High-Strength Bolts for Structural Steel Joints".
13. ASTM A384 - "Practice for Safeguarding against Warpage and Distortion during Hot-Dip Galvanizing of Steel Assemblies".
14. ASTM A446 - "Specification for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process, Structural (Physical Quality)".
15. ASTM A526 - "Specification for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process, Commercial Quality".
16. ASTM A527 - "Specification for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process, Lock-Forming Quality".
17. ASTM A668 - "Specification for Steel Forgings, Carbon and Alloy, for General Industrial Use".
18. ASTM A786 - "Specification for Rolled Steel Floor Plates".
22. ASTM F593 - "Specification for Stainless Steel Bolts, Hex Cap Screws and Studs".

1.04 SUBMITTALS

A. Submit shop drawings showing all materials, sizes, finishes, locations, attached hardware and fittings, and details for all items and fabricated metalwork, including field erection details showing cuts, copes, connections, holes, threaded fasteners and welds. Indicate all welds, both shop and field, by symbols conforming to AWS standards.

B. Furnish setting diagrams, erection plans, templates, and directions for the installation of backing plates, anchors, and other items.

C. Submit catalog descriptions of manufacturer's standard items.

D. Submit welding records.
E. Reproduction of Engineer's contract drawings for the purpose of making shop drawings shall not be permitted.

F. All submittals shall state the location and usage for each product.

1.05 PRODUCT DELIVERY, HANDLING AND STORAGE

A. Positively identify, and match-mark if applicable, all materials, items and fabrications, for installation and field assembly.

B. Wherever practicable, deliver items to project site as complete units, ready for installation or erection, with all anchors, hangers, fasteners and miscellaneous metal items required for installation.

C. Store steel above the ground surface on platforms, skids, blocking or other supports.

D. Protect from exposure to conditions that produce rust.

E. Store beams with webs vertical.

F. Handle steel so no parts are bent, broken or otherwise damaged and avoid damage to other material and work.

G. Replacements: In the event of damage, immediately make all repairs and replacements necessary to the approval of the Engineer and at no additional cost to the Owner.

1.06 LOCATION AND QUANTITIES

A. It is the intent of the Specification to indicate the quality, character and type of the items. The location and size shall be as shown on the Drawings.

PART 2. PRODUCTS

2.01 STANDARD ITEMS

A. Whenever practicable, item shall be standard products, meeting the requirements specified herein, of a manufacturer regularly engaged in production of such items.

2.02 SHAPES AND BARS

A. Mild Steel: ASTM A36, unless otherwise indicated.

B. Galvanized: ASTM A36, ASTM A123.
C. Stainless: ASTM A276, Type 304.


2.03 PLATE, SHEET, STRIP

A. Mild Steel: ASTM A36, or A283, Grade D.

B. High-Strength: ASTM A242.

C. Galvanized

D. Stainless: ASTM A240, Type 304.


2.04 PIPES AND TUBES

A. Mild Steel: ASTM A53, Type S, Grade B, Schedule 40 or 80 as shown on drawings.


2.05 FASTENERS

Galvanized for use with galvanized material; stainless for use with corrosion-resistant and stainless material.

A. Stainless
   1. Bolts: ASTM A 193, Grade B8, Class 2.
   3. Washers: Type 304.

B. Expansion Bolts: Hilti Kwik bolt or equal.

C. Fasteners, Anchors and Bolts:

2. Stainless Steel Anchor Bolts: ASTM A320 Grade B8, AISI Type 304.


5. High-Strength Structural Steel Bolts, Nuts and Washers: ASTM A 325.

D. Steel Anchor Bolts: Shapes as indicated, ASTM A 307 with galvanized finish.


2. Adhesive Anchors: AISI Type 304 stainless steel, which meets the requirements of ASTM F593. Anchor rods shall have rolled threads. Threads must be UNC-2A. Adhesive anchors shall be HVA Anchors by Hilti Fastening System, or approved equal.

2.06 WELDING ELECTRODES AND RODS

A. Structural Steel: AWS D1.1 and AWS A5.1 or AWS A5.5, E70 XX

B. Stainless Steel: AWS D1.1 and AWS A5.4 or AWS A5.9, suitable filler metal for intended usage.

C. Aluminum: AWS D1.2 and AWS A5.10, suitable filler metal for intended usage.

2.07 CHECKERED SAFETY PLATE

A. Steel Plate: ASTM A786, Pattern No. 2 rolled from ASTM A36, Grade A, thickness as shown on the drawings.

B. Aluminum Plate: Aluminum Diamond Tread Plate 6061-T6.

2.08 SAFETY TREADS

Stair treads shall be of grating type with anti-slip nosings. Grating pattern shall be the same as that of floor grating.

2.09 GRATING

A. Aluminum: ASTM B221, alloy 6061-T6.
B. All grating shall be Pressure Locked rectangular design, Type B, as manufactured by IKG Industries or equal. Grating shall be of depth shown on the drawings and shall be capable of carrying the loads shown. All exterior grating shall be serrated. Provide solid banding at all edges and cutouts.

C. Grating clamps shall be Plasti-Grate-Fast as manufactured by Struct-Fast, Inc. or approved equal.

2.10 PAINT AND COATINGS

A. Metal Coatings

Galvanizing: Provide a zinc coating for those items shown or specified to be galvanized as follows:

1. ASTM A153 for galvanizing iron and steel hardware.
2. ASTM A123 for galvanizing rolled, pressed and forged steel shapes, plates, bars and strip 1/8" thick and heavier.
3. ASTM A123 and A384 for galvanizing assembled steel products.

B. Galvanized Touch-up: Cold Galvanized Aerosol as manufactured by Rust-O-Leum or approved equal.

C. Ferrous Metals (D.I. vent piping)

1. Exterior or Interior - Immersion - Satin

   Surface Preparation: SSPC-SP10 Near White Blast Cleaning
   Primer Coat: Series 91-H2O Hydro-Zinc 2000 at 2.5 to 3.5 mils dft
   First Coat: Tnemec, N69 Hi-Build Epoxoline II at 4.0 - 6.0 mils dft

   Note: For Potable Water substitute Series 20 or FC20 Pota-Pox for Series 66

2.11 NEOPRENE GASKETS AND SEALING MATERIAL

A. Type NN-3 1060 Series as manufactured by Williams Products, Inc. or equal.

2.12 ROUGH HARDWARE

A. Provide bent or otherwise custom fabricated bolts, plates, anchors, hangers, dowels, and other miscellaneous steel and iron shapes as required for framing and
supporting woodwork, and for anchoring or securing woodwork to concrete and other structures.

B. Manufacture or fabricate items of sizes, shapes and dimensions required.

C. Provide malleable iron washers for heads and nuts that bear on wood structural connections: elsewhere furnish steel washers.

PART 3. EXECUTION

3.01 FABRICATION

A. General

1. Fabricate all work true to shape, size and tolerances as indicated on the Contract Drawings and approved Shop and Working Drawings; with straight lines, square corners or smooth bends; free from twists, kinks, warps, dents, and other imperfections. Straighten work bent by shearing or punching.

2. Thickness of the metal and details of assembly and support shall provide sufficient strength and stiffness to resist distortion during shipment, handling, installation, and under severe service conditions. Dress exposed edges and ends of metal smooth, with no sharp edges and with corners slightly rounded. Construct connections and joints exposed to weather to exclude water.

3. Provide sufficient quantity and size of anchors for the proper fastening of the work.

B. Fabricated Products

1. Pipe sleeves in concrete construction: standard weight, black steel pipe, with anchors welded to exterior; size as required to accommodate passage of conduits, pipes, ducts and similar items with proper clearance.

2. Gratings: Provide rectangular bar type aluminum gratings of size indicated. Provide bearing bars not less than 3/16 inch thick. Provide structural supports for gratings, of the material and shapes indicated, fastened to the structure with anchors. Unless otherwise indicated, provide gratings, which are removable but with clamps as specified herein before.

3. Channel Frames: Channel frames for miscellaneous doors and openings shall be structural steel. Bent metal anchors shall be provided.
4. Access Panels: Shall be flush type. Fabricate frames for access panels of steel not lighter than 14-gauge with welded joints and anchorage for securing into construction. Provide access panels of not lighter than 14-gauge steel, with stiffened edges and welded attachments. Install a removable access panel not less than 12" x 12" directly below each valve, flow indicator, damper, or air splitter that is located above the ceiling, other than an acoustical ceiling, and that would otherwise not be accessible. Provide exposed metal surfaces with a shop applied prime coat.

5. Miscellaneous Plates and Shapes: ASTM A36 or as indicated on drawings. Provide for items that do not form a part of the structural steel framework, such as lintels, sill angles, support framing for ceiling-mounted toilet partitions, miscellaneous mountings and frames.

Built-Up Lintels: Bolt or rivet together with separators if required. End bearings shall be not less than one inch per foot of span; with maximum bearing 8 inches and minimum bearing 4-1/2 inches. Set lintel with clearance of 1/2 inch above head of buck or frame, except at elevator hoistway entrances provide clearance as required for reinforcement of frame.

Loose Lintels: Provide over openings in masonry walls and partitions as indicated and as required to support wall loads over openings. Provide with necessary connections and fasteners. Construct to have at least 8 inches bearing on masonry at each end.

Angle Lintels: Provide masonry furring with not less than 1/4 inch by width and depth of leg 1/2 inch greater than thickness of furring. For clear spans exceeding 5 feet, support lintels by intermediate wall anchors spaced at intervals of not more than 4 feet.

C. Connections

1. Shop connections in weldable materials, not designed for service removal, shall be welded. All welding shall conform to AWS Handbook requirements. Weld behind finished surfaces wherever possible. Grind all exposed welds smooth. Remove weld, brazing, and shoulder spatter, flux, slag and oxides from finished surfaces. Use sheet metal lock seams only where indicated on the Contract Drawings or approved Shop and Work Drawings.

2. Complete all provisions for bolted field connections in the shop unless otherwise indicated.
3. Burning of holes for bolts in the shop or field will not be permitted; these shall be punched or drilled. Shapes may be cut in the shop by standard flame cutting machines and may be cut in the field only with the written consent of the Owner.

4. Match exposed work to produce continuity of line and design. Fabricate and fasten metalwork so that the work will not be distorted, the finish impaired, nor the fasteners overstressed from the expansion and contraction of the metal. Conceal fastenings wherever practicable. Use fastenings exposed to public view of the same color and appearance as the surrounding metal.

D. Castings and Forgings: Fabricated castings and forgings as indicated and true to pattern in form and dimensions, free from pouring faults, sponginess, cracks, blowholes and other defects, and with arrisers sharp and perfect. Sandblast castings as required to remove scale and sand and achieve a smooth, clean, uniform surface.

E. Galvanizing

1. Sheet: ASTM A446 or A526 or A527.


3. Items to be shop painted which are fabricated without welding entirely from galvanized shapes, hardware and sheet need not be galvanized after fabrication. All other fabrications to be galvanized shall be hot dipped after fabrication.

3.02 ERECTION AND INSTALLATION

A. Fastening to In-Place Construction: Provide anchorage devices and fasteners where necessary for securing miscellaneous metal fabrications to in-place construction including threaded fasteners for concrete and masonry inserts, toggle bolts, through-bolts, lag bolts, wood screws and other connectors as required.

B. Cutting, Fitting and Placement: Perform cutting, drilling and fitting required for installation of miscellaneous metal fabrications. Set work accurately in location, alignment elevation, plumb, level, true and free of rack, measured from established lines and levels. Provide temporary bracing or anchors in formwork for items, which are to be built into concrete, masonry or similar construction.

C. Fit exposed connections accurately together to form tight hairline joints. Weld connections, which are not to be left as exposed joints, but cannot be shop welded because of shipping size limitations. Grind exposed joints smooth and touch up
shop paint coat. Do not weld, cut or abrade the surfaces of exterior units, which have been hot dip galvanized after fabrication and are intended for bolted or screwed field connections.

D. Field Welding: Comply with AWS Code for procedures of manual shielded metal arc welding, appearance and quality of welds made and methods used in correcting welding work.

E. Setting Loose Plates:


2. Set loose leveling and bearing plates on wedges or other adjustable devices. After the bearing members have been positioned and plumbed, tighten the anchor bolts and cut off wedges flush with the edge of the bearing plate before packing with grout in concealed locations where not exposed to moisture. Use non-metallic non-shrink grout in exposed locations unless otherwise indicated.

3. Pack grout solidly between bearing surfaces and plates to ensure that no voids remain.

F. Expansion Joints: Provide expansion joints at locations indicated, or if not indicated, at intervals not to exceed 24 feet. Provide slip joint with internal sleeve extended 6" beyond joint on either side. Fasten internal sleeve securely to one side; locate joint within 1'-0" of posts. Railing shall be installed such that the shown gap at the expansion joint exists at the time of installation. Railings shall not be installed when the ambient temperature is less than 30°F.

G. Dissimilar Materials: Where dissimilar metals are in contact, or where aluminum is in contact with concrete, mortar, masonry, wood, or absorptive materials subject to wetting, protect the surfaces with a coat of paint as specified.

H. Draw threaded bolt connections up tight with lock washers or other means to prevent loosening. Screw fasteners in exposed or finished surfaces may be slot or phillips head type, but in either case, screws must be countersunk design.

I. Adhesive anchors shall be installed per manufacturer's recommendations.

J. Installation of roof hatch shall be in accordance with the manufacturers printed instructions. Hatch manufacturer shall guarantee against defects in material and workmanship for a period of five years.
K. Installation of access panels shall be per manufacturer's recommendations. Size of openings shall be verified to match access panel dimensions.

END OF SECTION
SECTION 15000

GENERAL MECHANICAL REQUIREMENTS

PART 1  GENERAL

1.01  SCOPE OF WORK

A.  The provisions of this entire section of the specifications are intended to govern the quality of design, fabrication, workmanship, operation, etc., of all materials, equipment and appurtenances to be furnished and installed under the various sections of the mechanical specifications and all other sections that include mechanical equipment as part of the specified items.

1.02  SHOP DRAWINGS

A.  Shop drawings, including dimensioned drawings, descriptive literature, performance data, electrical characteristics, and in general all information necessary to prove compliance with the specifications, shall be submitted as required in Section 01300-SUBMITTALS.

1.03  GUARANTEE

A.  All materials, equipment, workmanship and performance shall be guaranteed for the period and in accordance with the provisions of the GENERAL CONDITIONS.

1.04  MANUFACTURER'S CERTIFICATES

A.  The Contractor shall furnish Manufacturer's Certificates for all equipment items as required by Section 01300 - SUBMITTALS.

1.05  MANUFACTURER'S OPERATION AND MAINTENANCE MANUALS

A.  The Contractor shall provide manufacturer's operation and maintenance manuals as required in Section 01300 - SUBMITTALS.

1.06  MANUFACTURER'S LISTS

A.  Within thirty days after the date of award of contract, the Contractor shall submit to the Engineer a complete list of proposed manufacturers for all equipment and materials to be used except for those required to be listed in the Bid Form. Complete separate manufacturer's lists shall be submitted for each Mechanical and Equipment section of the specifications. No consideration will be given to partial or incomplete lists. After approval of each manufacturer's list, detailed shop drawing and/or
material lists shall be submitted as specified hereinafter.

1.07 STANDARDS

A. Where standards, codes or specifications are referred to, the reference is to particular standards, codes or specifications together with all the latest amendments and errata applicable at the time the bids are taken. These are listed below:

- IEEE - Institute of Electrical & Electronics Engineers
- AMCA - Air Moving and Conditioning Association, Inc.
- ASTM - American Society for Testing Materials
- ASME - American Society of Mechanical Engineers
- ANSI - American National Standards Institute
- ASHRAE - American Society of Heating, Refrigerating & Air Conditioning Engineers
- AWS - American Welding Society
- AWWA - American Water Works Association
- NFPA - National Fire Protection Association
- NEMA - National Electrical Manufacturer's Association
- Federal - Federal Government Specifications
- OSHA - Occupational Safety and Health Act
- UL - Underwriters Laboratories, Inc.
- NSF - National Sanitation Foundation
- SMACCNA - Sheet Metal and Air Conditioning Contractors National Association

1.08 GENERAL DESIGN OF EQUIPMENT AND MACHINERY

A. All equipment and machinery furnished under this contract shall be of the latest and most improved design suitable for the service of which it is to be used. All equipment and machinery shall be designed and constructed to operate efficiently, continuously and quietly under the specified requirements with a minimum of labor, power, maintenance, renewals and repairs. The design and construction of all equipment and machinery shall be such as to permit operation with minimum noise, wear and vibration (maximum amplitude of 3.0 mils peak to peak unless otherwise specified) when properly installed.

B. Ample room for erecting, repairs, inspecting and adjusting all equipment and machinery shall be provided. The design, construction and installation of all equipment and machinery shall conform to and comply with the latest safety codes and regulations.

C. The design and construction of the several units shall be such that they shall present a uniform appearance and the arrangement shall be such that their operation shall be in harmony in every respect. Whenever possible, fittings and fixtures of the same
make and model shall be used for the several units and their connections. All equipment of identical type and service shall be the product of the same manufacturer.

D. All equipment selected shall be of such size and general arrangement to suit the space in which it is to be installed.

E. The various parts of the equipment and machinery shall be of plain shape and good lines, especially designed and constructed for strength and durability. Castings shall be designed and constructed to cool uniformly without shrinking strains and shall have good sized fillets at all re-entrant corners. Sudden change of section shall be avoided.

F. Whenever possible, parts of each unit shall be made to gauge and be a duplicate of and interchangeable with the same parts of other machines of the same size and kind.

G. The workmanship shall be of the highest class throughout.

H. All assemblies shall be completely shop fabricated and structural steel parts shall be shop erected. Assemblies and structural steel parts shall be match marked before being disassembled for shipment. Parts shall be shipped assembled in as large unit as possible to minimize field re-assembly. All parts shall be amply proportioned for all stresses which may occur during operation, and for any additional stresses which may occur during fabrication and erection.

I. Unless otherwise specified, welding shall be in accordance with the latest standard specifications for "Gas Tight Welding" of the American Welding Society.

J. Unless otherwise specified, galvanizing shall be hot-dipped, in accordance with the latest standard specifications for "Zinc Coating" of the ASTM, Serial Designation A-123.

K. Unless otherwise specified herein, starters, H-O-A switches, pushbuttons and other electrical devices shall be specified and provided under the ELECTRICAL DIVISION of the specifications, and shall be arranged as shown on the Contract Drawings.

PART 2 PRODUCTS

2.01 MATERIALS

A. Unless otherwise specified, materials shall be in accordance with the following latest Standard Specifications of the ASTM:
Structural Steel A-36
Welding Steel Pipe A-53
Iron Castings A-48 or A-126
Babbitt B-23
Bronze Castings B-30
Bronze (Manganese) B-138
Bronze (Silicone) B-98
Steel Bolts A-307
Zinc (Hot-Galvanizing) A-123

B. All materials shall, if required, be tested and shall fulfill all requirements specified. Physical tests may be made by the Owner. The Contractor at his own expense shall furnish test pieces and samples in the number, shape, size and finish required by the Engineer. All broken material shall become the property of the Owner. The failure of test specimens to fully conform to the requirements of the specifications shall be sufficient cause for rejection of the whole melt or stock from which samples were obtained.

C. Iron castings shall be smooth, clean and free from scale, lumps, blisters and other defects. No plugging, welding or filling will be allowed.

D. The alloy grade number of all babbitt shall be that bearing alloy of a composition recommended by the manufacturer of the equipment or machinery for the service required, subject to the approval of the Engineer.

E. All bronze shall be made of new material and shall be free from objectionable imperfections. If the materials show signs of improper mixing when being machined, the castings will be rejected.

2.02 FLANGES AND BOLTS

A. Flanges, except as otherwise specified, shall be cast solid, and bolt holes shall be drilled and spot-faced on the back. Stud holes shall not be drilled through. Flanges shall be uniform in thickness and shall come fair and, if required, shall be turned or chipped in a neat and workmanlike manner.

B. Jacking screws shall be provided for covers, etc. where required, and also suitable eye bolts for lifting. Bolts and nuts shall be of the best quality of open hearth, free machining steel. Bolts shall have good, sound well-fitting threads; nuts shall be cold pressed. All heads, nuts and threads shall be of the American Standard regular sizes. All ferrous bolts and nuts shall be galvanized by the hot dipped process.

PART 3 EXECUTION

3.01 MANNER OF INSTALLATION
A. The general arrangement of pipe and equipment shall be as shown on the Drawings. Detailed drawings of proposed departures due to actual field conditions or other causes shall be submitted to the Engineer for approval. The Contractor shall carefully examine the drawings and shall be responsible for the proper fitting of materials and equipment as indicated, without substantial alteration. Because of the small scale of the drawings, it is not possible to indicate the exact location of piping, all offsets, fittings and accessories which may be required. The Contractor shall carefully investigate the space requirements for proper clearances and the structural and finish conditions affecting his work and shall arrange such work accordingly, furnishing accessories as may be required to meet such conditions.

B. Each trade shall determine the location, size, etc. of all chases and openings required for the proper installation of its work, and shall see that such are provided. Where it is necessary to run pipes or ductwork through walls or fittings, the trade performing the work shall notify the Contractor so that proper provisions can be made for same. Each trade shall furnish and set all inserts, sleeves, hanger supports, etc. required for its work and shall be responsible for their proper and permanent location.

C. All piping and ductwork exposed to view shall be run generally parallel with the lines of the structure and as close to walls and columns as may be practical and consistent with proper grade and the maintenance of proper clearances for access to all parts requiring servicing.

D. The Contractor, in the prosecution of the work, shall do no cutting of masonry, concrete or other materials after same have been installed, without the written permission of the Engineer.

### 3.02 TESTING

A. After erection, the Contractor shall adjust and balance all equipment and systems, and shall demonstrate that all equipment is operating in a satisfactory manner. Adjustments shall be made as necessary. All defective parts on machinery shall be replaced.

B. The Engineer shall be notified in advance of all tests and all tests shall be conducted to his entire satisfaction.

C. See paragraph, MANUFACTURER’S CERTIFICATE, for further requirements on selected major items of equipment.

### 3.03 MISCELLANEOUS

A. Finished parts shall be well protected in the shop, during transportation and before and after erection to prevent injury of any kind. Injured parts which in the opinion of
the Engineer are damaged or which cannot be refitted, shall be promptly replaced by the Contractor without expense to the Owner. All exposed finished parts of machinery shall be greased or oiled before shipment.

B. The Contractor shall furnish all tools of special nature which are required for making adjustments (by the Owner after the work has been turned over to him) to equipment, but will not be required to furnish standard tools.

C. All exposed belts, gears, and drives shall be protected with guards. Guards may be of the equipment manufacturer's standard design, but must meet all the OSHA Standards.

3.04 PAINTING AND LABELING

A. All fabricated or assembled surfaces normally painted shall be thoroughly dry and free from all rust, grease, dirt or scale. Unless otherwise specified herein, shop prime painting and field finish painting shall be specified under other specification sections. The Contractor is reminded to correlate the selection of shop prime coats to be compatible with subsequent field applied coats of paint. The Contractor shall "touch-up" paint any item damaged during shipping or installation.

3.05 ADJUSTMENTS TO RELATED WORK

A. The final work shall include any adjustment that may be required by the approved equipment furnished, with modifications made to concrete shapes and to dimensions shown on the contract drawings as may be required to suit the details of the approved equipment furnished, all at no additional cost to the Owner.

3.06 CERTIFICATION OF WELDERS

A. For field welding, the Contractor shall submit to the Engineer for his review and approval a certified statement, from an approved testing agency for each welder he proposes to use for welded piping. Each certified statement shall indicate that the welder has, within six months from proposed employment on this project, been successfully qualified under the requirements of Section IX of the ASME Boiler Construction Code. All certificates and qualifications shall be at the Contractor's expense. The Engineer will return the certified statements to the Contractor for retention on job in the Contractor's field office. Any work installed by an individual who has not been qualified by the testing agency and approved by the Engineer shall be removed by the Contractor and shall be replaced with work installed by qualified and approved welders at the Contractor's expense.

B. Care shall be exercised during all welding operations to prevent injury or damage to personnel and property.
3.07 SCAFFOLDING - RIGGING - HOISTING

A. Unless otherwise specified, the Contractor shall design and furnish all scaffolding, rigging, hoisting and services necessary for erection and delivery onto the premises of any materials and equipment furnished. The Contractor shall remove same from the premises when no longer required.

3.08 SUPPLEMENTARY SUPPORTING STEEL

A. All supplementary supporting steel required to support ducts, piping, electrical services, equipment, etc. shall be provided by the Contractor.

END OF SECTION
SECTION 15060

PIPE, VALVES AND FITTINGS

PART 1 - GENERAL

1.01 SCOPE OF WORK

A. The Contractor shall supply all services, labor, tools and equipment to furnish and install all materials and appurtenances necessary for the complete and satisfactory installation of all piping systems as shown on the Contract Drawings and as required for a complete installation as specified herein.

1.02 SHOP DRAWINGS

A. Shop drawings, shall be submitted for items specified herein as specified under Section 01300 - SUBMITTALS. For material and equipment readily identified in standard publications of equipment manufacturers, it will be sufficient to state only the catalog number and to provide catalog cuts of the item in the submission. The Contractor shall provide a layout of all systems requiring piping 4-inches and larger. All piping layout drawings shall be two line drawings accompanied by a bill of materials. Single line piping drawings are not acceptable.

1.03 RELATED WORK SPECIFIED ELSEWHERE

A. Section 02200 – Earthwork, Excavation, Trenching and Backfilling
B. Section 02223 – Vibration Control
C. Section 02615 – Ductile Iron Pipe and Fittings
D. Section 02625 – Polyvinylchloride Pipe and Fittings

1.04 GENERAL NOTES

A. Certain types of pipes and piping systems are specified under the sections identified under 1.03 Related Work Specified Elsewhere.

B. The Contractor shall verify all dimensions of valves, special castings and fittings, pipe, equipment, etc., so that all of the pipe work performed will fit together properly and will conform to the arrangement as shown on the drawings. In selecting laying lengths of fittings, the Contractor shall be guided by the dimensions of equipment to which connections are made and by the indicated dimensions on the drawings. All pipe and specials shall be accurate to the dimensions shown. Hubs, spigots, and bells shall be at right angles to the axis of the opening, and openings shall be at the exact angle specified.
C. Ductile iron fittings shall be made of ductile iron of good quality and of such character as shall make the metal castings strong, tough and of even grain and soft enough to satisfactorily permit drilling, tapping and cutting. All fittings shall be smooth, free from cold shuts, scale, lumps, blisters, and sand holes and defects of every nature which make it unfit for the use intended. All fittings and shall be true circles in section with its inner and outer surfaces concentric. No plugging, filling, burning-in or welding shall be allowed. All fittings shall be subject to inspection and approval by the Engineer upon delivery, and no broken, cracked, mis-shaped or otherwise damaged or unsatisfactory fittings will be accepted.

D. All pipe shall have identification markings showing the nominal size, material, AWWA pressure class, AWWA standard designation, manufacturer’s name, production record code and testing agency seal conspicuously painted on it as near as possible to the bell end of the pipe and these designations shall be clearly legible.

E. All couplings and fittings shall have identification markings showing the nominal size, deflection angle (if appropriate), material, AWWA pressure class, AWWA standard designation, manufacturer’s name and testing agency seal conspicuously painted on it and these designations shall be clearly legible.

F. Wherever pipe is specified or shown as having a spigot end, plain end will be acceptable.

G. Where required or shown, the Contractor shall provide pipe specials. Specials shall in general consist of spool pieces, less than standard lengths of spigot end, or bell end pipe, or combination of ends, and nonstandard fittings. The specials shall conform in material, thickness and finish to the pipe in which they are installed. Tapped reinforced bosses shall be provided as an integral part of fittings, when shown or specified.

H. It is to be noted that in the relatively small piping systems, the drawings do not necessarily show all fittings, offsets, unions, hangers, supports, etc. All such items shall be furnished and installed, however, as required for complete and satisfactory installation of the equipment shown.

I. All gaskets for pipe, valve and fitting joints shall be rubber ring gaskets in accordance with ASTM F-477.

J. Nuts and bolts shall be in accordance with AWWA C-111/A21.11.

1.05 VALVES - GENERAL

A. Valves specified herein shall have the type of ends specified or as indicated on the drawings or as required by pipe or equipment connections.
B. No valves shall be installed with stems in the vertical down position.

C. All valves on vertical pipes shall have their stems oriented to give maximum operational clearance, or shall be oriented as directed by the Engineer.

D. Each piece of equipment or appliance shall be separately valved so that supply and return services can be shut off and the piece of equipment or appliance removed if desired, without disturbing the piping systems. Valves shall be located so as to be easily accessible to operator of equipment. Valves shall be installed whether shown on the drawings or not.

E. The valve and operator shall be the responsibility of the valve manufacturer.

1.06 FITTINGS - GENERAL

A. All fittings shall be of the type indicated on the drawings unless otherwise specified. PVC piping shall be provided with PVC or ductile iron fittings. Copper tubing shall be provided with bronze, wrought copper or brass fittings. In general, all fittings shall be as specified hereinafter in paragraph entitled "Pipe and Fittings Schedule."

B. Nipples shall be extra heavy and of same material as piping system in which they are installed. Close nipples are not acceptable.

C. Wherever the sizes of pipes are reduced, fittings shall be used for reductions without the use of bushings.

D. In general, soft copper tubing shall have flared type fittings, and hard copper tubing shall have soldered joint fittings or "Swagelok" for 1" tubing or less.

E. Screwed type systems shall contain ample unions in piping at equipment and valving of the system to allow easy removal of the equipment or disassembly of the system.

PART 2 - PRODUCTS

2.01 PIPE AND FITTINGS SCHEDULE

A. Pipe and fittings shall be as indicated on the drawings and as listed in the following sections. Systems which may not be listed shall be comprised of the same kind of pipe and fittings as in similar systems which are listed, or as directed by the Engineer.

2.02 DUCTILE IRON GRAVITY SEWER AND WATER PIPING

A. Refer to Section 02615 – Ductile Iron Pipe and Fittings
2.03 POLYVINYLCHLORIDE PIPE AND FITTINGS

A. Refer to Section 02625 – Polyvinylchloride Pipe and Fittings

2.04 JOINTS

A. All joints at equipment shall conform to the equipment requirements. No direct welded connections shall be made to valves or other equipment. Right and left couplings, long screws, or caulking of pipe threads or gasket joints will not be permitted. Mitered joints for elbows and notching straight runs of pipe for tees or elbows will not be permitted.

B. Soldered or brazed joints shall be made with solder and a non-corrosive paste flux. The solder mixture will be of 95-5 (tin-antimony) content. The use of acid core solder shall not be permitted. The application of excess heat shall be avoided to prevent undue softening or burning of the fittings or tubing when making connections. All soldering operations shall be performed in strict accordance with best accepted practices. Tubing shall be square cut and reamed to remove all burrs. The inside of the fittings and the outside of the tubing at each end shall be well cleaned immediately prior to soldering to remove all traces of oxidation, regardless of how clean the surfaces of the pipe and fittings may appear.

C. Threads shall be standard, clean-cut and tapered. All pipe shall be reamed free from burrs and kept free from scale and dirt. Unless otherwise specified, threaded joints shall be made up with "Permatex" type 2, black, non-hardening pipe joint compound applied to the male thread only. The use of red lead or white lead will not be permitted. The complete threaded joint shall not have more than two threads exposed when made tight. Threads shall comply with ANSI B2.1.

D. Except where special couplings are indicated, piping requiring screwed connections shall be connected with screwed, malleable iron, ground joint, brass seat, 150 psi unions; for piping requiring flanged connections, flanged malleable iron unions shall be used. The finish of all unions shall match piping in which they are installed. Unions shall be provided at equipment and where required otherwise to facilitate removal of piping or equipment.

E. Mechanical joints shall be made up with rubber gaskets conforming to ANSI A 21.11. Glands shall be bituminous coated and bolts and nuts shall be of high strength cast iron or high strength low alloy steel.

2.05 COUPLINGS

A. Couplings for Pipes of Equal Size (Joining Couplings)
1. Joining couplings shall be standard weight design with a rolled steel followers, gaskets, steel sleeve and high strength bolts and nuts. Followers shall be AISI C1020 steel. Gaskets shall be synthetic rubber, Grade 60. Sleeves shall be carbon steel with a minimum yield strength of 30,000 psi. Bolts and nuts shall be high-strength, low alloy steel with heavy semi-finished hexagon nuts.

2. Sleeve and followers shall have a fusion bonded epoxy costing in accordance with AWWA C500.

3. Couplings shall be Smith-Blair Model 411 or an approved equal.

B. Couplings for Pipes of Unequal Size (Transition Couplings)

1. Transition couplings shall be standard weight design with a rolled steel followers, gaskets, steel sleeve and high strength bolts and nuts. Followers shall be AISI C1020 steel. Gaskets shall be synthetic rubber, Grade 60. Sleeves shall be carbon steel with a minimum yield strength of 30,000 psi. Bolts and nuts shall be high-strength, low alloy steel with heavy semi-finished hexagon nuts.

2. Sleeve and followers shall have a fusion bonded epoxy costing in accordance with AWWA C500.

3. Couplings shall be Smith-Blair Model 413 or Model 415 or an approved equal.

C. Couplings for Pipes of Different Materials

1. Couplings for joining pipes of different materials shall be the same as transition couplings and shall meet the requirements of paragraph 2.06.B.

2.06 AIR RELEASE VALVES

A. Air release valves shall be small orifice type and shall be either of the a) kinetic design type employing only one moving part, a stainless steel float ball or b) of the stainless steel float and lever type. It shall maintain the closed position to prevent the loss of water by positive seating of the float ball against a smoothly ground contact surface of the exhaust orifice.

It shall automatically provide for the escape of air to atmosphere without the loss of water when the float ball moves away from the orifice seat. The body of the valve shall be cast iron and shall be coated to withstand a moist environment.

B. Air release valves shall have a minimum of a 1” NPT inlet for 6”, 8”, and 12” pipe
sizes and a 2” NPT inlet for pipes 16” and larger, and shall have a minimum of a 3/32” outlet orifice for 6”, 8”, and 12” pipe sizes and a 3/16” outlet orifice with 16” and larger pipes.

C. Air release valves shall be suitable for 150 psi working pressure at a minimum.

D. All flushing attachments shall be provided with air release valves.

E. Air release valve manholes shall be concrete meeting the requirements of ASTM C-478. Diameters shall be as shown on the contract drawings, but in no case shall they be less than 4 feet inside diameter. Manhole frame and covers meeting the requirements for sanitary manhole frame and covers shall be utilized except that the covers shall have the word “WATER” cast on them. See Section 03400 – Sanitary Sewer Manholes for frame and cover specifications.

F. Air release valves shall be Cla-Val 34AR or an approved equal.

2.07 GATE VALVES

A. Gate valves shall comply with AWWA Standard C500, latest revision, and the following:

1. All valves shall be manually operated, inside screw and yoke, equipped with operating nut, for installation in a vertical position, unless otherwise specified. They shall be iron body, bronze mounted, double disc with one of the resilient seat designs.

2. All valves shall open left (counter clockwise). Buried valves shall have mechanical joints while exposed valves shall have flanged joints. All joint surfaces of mechanical joint end gate valves, which will be in contact with the mechanical joint gasket, shall be fully machined to the dimensions and tolerances set forth in ANSI A21.11.

3. The bodies, bonnets and other cast iron parts shall conform in all respects to the American Society for Testing Materials’ Standard Specifications for Gray Iron Castings, ASTM Specification Designation A-126, Class B for valve sizes 4” through 24” and A-126, Class C for valve sizes 30” through 48”. The castings shall be clean and perfect without blow or sand holes or defects of any kind. No plugging or stopping of holes will be allowed.

4. All valves shall have either a bronze stem collar bushing with two O-rings above the stem collar or a stem collar with one O-ring below and one O-ring above the stem collar, with the stem collar being completely sealed in a permanent grease reservoir.

5. All other materials not specified shall meet AWWA C500, latest edition.
6. Valves 4” through 12” must have a 200 psi working and 400 psi test pressure.

7. All valves shall be manufactured to allow removal of seal plate under pressure in either an open or closed position.

8. If the standard valve provided by a manufacturer does not fully comply with these specifications, but compliance can be attained by providing optional features, then each valve must be permanently marked to indicate the option or options that have been provided. The method of marking valves indicating the options must be approved by the County.

9. Stainless Steel bolts are required for all valves. Bolts shall be grade 8 with grade 10 nuts.

B. Resilient Seat Gate Valves (6” – 12”):

1. All resilient seat gate valves 6”-12” in size shall comply with AWWA C-509, latest revision.

2. All valves shall be manually operated non-rising stem, equipped with operating nut, for installation in a vertical position, unless otherwise specified, and the valve body shall be ductile iron with reinforced flanges.

3. All iron surfaces, internal and external, must be coated with a minimum 8 mils thickness of hand applied epoxy or 3-5 mils thickness fusion bonded epoxy.

4. The valve stem shall have an independent stem nut (not rigidly attached to the gate), which allows the gate to flex without stressing the stem.

5. All valves shall have either a bronze stem collar bushing with two O-rings above the stem or a stem collar with one O-ring below and one O-ring above the stem collar.

6. Seating shall use compression closure. The gate shall be of a true bi-directional, mirror image design.

7. Valves shall have a smooth bottom design.

8. All valves shall open left (counter-clockwise). Buried valves shall have mechanical joints.

valve sizes 6” through 12”. The castings shall be clean and perfect without
blow or sand holes or defects of any kind. No plugging or stopping of holes
will be allowed.

10. Valves 6” through 12” must have a 200 psi working and 400 psi test pressure.

11. If the standard valve provided by a manufacturer does not fully comply
with these specifications, but compliance can be attained by providing optional
features, then each valve must be permanently marked to indicate the option
or options that have been provided. The method of marking valves to indicate
that options are included must be approved by the County.

C. Gate valves shall be Mueller A-2360 (Resilient Wedge), U. S. Pipe – Metroseal 250,
M & H Style 406, American Flow Control (Series 2500), Clow Figure F-6100,
Kennedy Model KenSeal II – 4571RSGV, or approved equal.

2.08 FIRE HYDRANTS

A. Fire hydrants shall be manufactured in full compliance with this specification and
shall also comply with the AWWA Fire Hydrant Specification C-502, latest revision
and the following:

1. Type: Compression - Dry Standpipe: Valve shall open against and close with
the pressure. The design shall be such that all internal operating parts can be
removed through the standpipe and main valve rod extended without
excavating.

2. Size: Internal valve diameter shall be a minimum of five and one quarter
inches (5 ¼”).

3. Inlet Size and Type: Six inch (6”) mechanical joint end with accessories.

4. Hose Nozzles: Each hydrant shall be equipped with two, two and a half inch
(2½”) I.D. hose nozzles with National Standard threads, one quarter (1/4)
turn bayonet lock or threaded in with O-ring seal, and suitable locking
arrangement.

5. Steamer Nozzle: Each hydrant shall be equipped with one four and a half
inch (4½”) Steamer Nozzle having National Standard Threads, one quarter
(1/4) turn bayonet lock or threaded in with O-ring seal, and suitable locking
arrangement.

6. Direction of open: Left, counter – clockwise. Standpipe - Ground line Safety
Construction: The standpipe sections shall be Direction of Open: Left,
counter-clockwise.

7. Size and Shape of Operating Nut and Cap Nuts: to be one and one half inch
(1½”) point to flat pentagon. Each hydrant shall be equipped with a weather
cap.
8. Seal Plate: The hydrant shall be so constructed that a moisture-proof lubricant chamber is provided which encloses the operating threads, thereby automatically lubricating the threads each time the hydrant is operated. The lubricant chamber shall be enclosed with at least three O-rings. The two lower O-rings will serve as pressure seals; the third O-ring will serve as a combined dirt and moisture seal to prevent foreign matter from entering the lubricant chamber. The hydrant shall be equipped with either an anti-friction washer or bronze bushing to reduce operating torque. The bonnet will be secured to the hydrant using bolts and nuts.

9. Bury line safety construction: The standpipe section shall be connected at the ground line by a two part, bolted safety flange or breakable lugs. The main valve rod sections shall be connected at the ground line by a break away coupling. The standpipe and ground line safety construction shall be such that the hydrant nozzles can be rotated to any desired position without disassembling and removing the top operating components and the top section of the standpipe. The minimum inside diameter of the barrel shall be six inches (6”).

10. Main Valve, Stem Assembly: The main valve rod assembly shall be so constructed to allow removal of all operating parts through the barrel regardless of depth of bury, using a removal wrench which does not extend below the ground line of the hydrant. The main valve seat ring shall be bronze and its assembly into the hydrant shall involve bronze-to-bronze thread engagement, and the valve assembly pressure seals shall be obtained without the employment of torque-compressed gaskets. The design of the main valve rod shall be such that the operating threads at the top of the rod and the valve assembly threads at the bottom of the stem are isolated from contact with water in the standpipe or in the hydrant inlet shoe.

11. Drain Valve: The operation of the drain mechanism shall be correlated with the operation of the main valve and shall involve a momentary flushing of the drain ports each time the hydrant is opened. The drain ports shall be fully closed when the hydrant valve is more than two and a half (2½) turns open and the drainage channel in the bronze valve seat ring shall connect to two or more outlet drain ports. No springs may be employed in the hydrant valve or drain valve mechanism.

12. The drain valve will be protected with at least one-half (½) yard #57 stone protected with filter cloth.

13. Depth of Bury: Normally hydrants shall be suitable for installation in trenches four and a half feet (4-1/2’) deep. Required parts and materials to adjust fire hydrants to different depth of bury shall be provided by the manufacturer to meet actual field conditions.

14. Painting Instruction: Two prime coats and one Rustoleum Safety Red # 7564 finish coat shall be used, unless otherwise specified. Exposed area of fire hydrant shall receive one field coat of Rustoleum Safety Red # 7564 after installation. The wetted surface of the hydrant shoe shall be epoxy coated to prevent corrosion of the waterway.
a coat of reflective 3M Scotchlite 7210 Silver paint is required around the bonnet.

15. Pressure Rating: Test pressure 300 psi, working pressure 150 psi.

B. If the standard hydrant provided by a manufacturer does not fully comply with these specifications, but compliance can be attained by providing optional features, then each hydrant must be permanently marked to indicate the option or options that have been provided. The method of marking hydrants to indicate that options are included must be approved by the Inspector.

C. Fire hydrants shall comply with AWWA C502, all brass and NSF 61 approved. Fire hydrants shall be Mueller (Super Centurion 250) or Kennedy K81D.

PART 3 - EXECUTION

3.01 MINIMUM SLOPES

A. Gravity sewer pipe shall be installed to the lines and grades indicated on the drawings.

3.02 CONNECTION AT DISSIMILAR METALS

A. Wherever pipes of dissimilar metals join, there shall be provided an insulating union, coupling or flange connector for corrosion control. Connectors shall include an approved type dielectric separator. Connectors shall be the product of Dresser Corporation, F. H. Maloney Company, Universal Controls Corporation, or equal. Stainless steel nuts, bolts, and washers shall be used at all places at which such dielectric separators are used.

3.03 TESTING OF PIPES

A. Refer to testing requirements outlined in the following specification sections:

02615 – Ductile iron pipe and fittings
02625 – Polyvinyl chloride pipe and fittings

3.04 AS-BUILT SHOP DRAWINGS

A. The Contractor shall provide the Engineer with four sets of prints of As-Built Shop Drawings for each piping system showing all equipment, together with one set of "mylar" reproducibles. Drawings shall show numbers and/or letters for all equipment, as specified herein.
Appendix A

Geotechnical Boring Logs
**CONNELLY AND ASSOCIATES, INC.**  
**TEST BORING FIELD LOG**

Project: Massaponax Interceptor  
Project No: 46340-02  
Boring No: A-58

Date: 11/17/04  
Driller: Tom Chew  
Logged By: Cody Hanes

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<th>Strata Depth</th>
<th>Strata Description and Remarks</th>
<th>Sample No.</th>
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<th>Depth To</th>
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<th>2nd 6&quot;</th>
<th>3rd 4th 6&quot;</th>
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<td>20 - 26</td>
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<td>27 - 12</td>
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<td>13.5 - 14.4</td>
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<td>18.5 - 18.9</td>
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<td>12&quot; - 18.9&quot;</td>
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**METHOD OF DRILLING**

RIG NO. & TYPE: V-D50  
HAMMER: MAN. X: AUTO  
HSA: DIA. 2 1/4'  
BORING DIA. BIT USED  
CASING DIA. L.D. LENGTH  
UNDISTURBED SAMPLES: No. Size  
BAG SAMPLES: No.  
SPECIAL TEST (hrs & explain)

**WEATHER** 70°  
**WATER LEVEL READINGS**: DEPTH  
ENCOUNTERED AT: 5.5'

BEFORE PULLING AUGERS: 12'

AFTER PULLING AUGERS: Dry

CAVE-IN DEPTH: 8' AT COMPLETION.
**CONNELLY AND ASSOCIATES, INC.**  
**TEST BORING FIELD LOG**

Project: Massaponax Interceptor  
Project No: 46340-02  
Boring No. A-59

Date: 11/15/04  
Driller: Tom Chew  
Surface Elev.

Logged By: Cody Hanes

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<th>2nd 6&quot;</th>
<th>3rd 6&quot;</th>
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19.3 End of Boring

**METHOD OF DRILLING**

RIG NO. & TYPE V-D50  
HAMMER: MAN. M. AUTO  
HSA: DIA. 2 1/2 I.D.  
BORING DIA. BIT USED  
CASING DIA. I.D. LENGTH  
UNDISTURBED SAMPLES: No. Size  
BAG SAMPLES: No.  
SPECIAL TEST (hrs & explain)  

**WEATHER** 45°  
**WATER LEVEL READINGS:**  
**DEPTH**  
**TIME**

ENCOUNTERED AT: 2.5’  
BEFORE PULLING AUGERS: 14’  
AFTER PULLING AUGERS: 4’  
CAVE-IN DEPTH: 6’ AT COMPLETION.
# Test Boring Field Log

**Project:** Massaponax Interceptor  
**Project No:** 46340-02  
**Boring No:** A-60

**Date:** 11/15/04  
**Driller:** Tom Chew  
**Surface Elev:**

Logged By: Cody Hanes

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**End of Boring**

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**Method of Drilling**

- **RIG NO. & TYPE:** V-D50
- **HAMMER:** MAN. X AUTO
- **HSA:** DIA. 2 ¼ I.D.
- **BORING DIA.** BIT USED
- **CASING DIA.** I.D. LENGTH
- **UNDISTURBED SAMPLES:** No. Size
- **BAG SAMPLES:** No.
- **SPECIAL TEST (hrs & explain):**

**Weather:** 30°

**Water Level Readings:**

**Encountered At:** None

**Before Pulling Augers:** Dry

**After Pulling Augers:** Dry

**Cave-in Depth:** 12' AT COMPLETION.
Appendix B

Corps of Engineers - Nationwide 12 Permit and Conditions
Northern Virginia Regulatory Section  
NAO-2014-00667 / VMRC#17-1936 (Massaponax Creek and associated tributaries)

Spotsylvania County Department of Utilities  
Attn: Mr. Scott Powell-Director of Capital Construction  
8960 Courthouse Road  
Fredericksburg, Virginia 22553

Dear Mr. Powell:

This is in reference to the Department of the Army application (NAO-2014-00667 / VMRC#17-1936) to temporarily impact approximately 0.691 acres of wetlands, temporarily impact 476 linear feet of steams, and permanently convert 0.397 acres of PFO and PSS wetlands to PEM. These impacts are associated with the replacement of approximately 9,400 linear feet of the Massaponax Interceptor sewer. The proposed interceptor will replace the existing pipe with a larger size pipe (18” diameter) and require a maximum 30’ permanent easement along with a 10’ temporary easement. The portion of the sewer to be replaced extends from Gordon Road (Route 627) to approximately 400 feet west of Highland Oaks Drive (1000 feet west of Route 674) in Spotsylvania County, Virginia. Your proposed project as described above and depicted on attached drawings entitled “MASSAPONAX INTERCEPTOR REPLACEMENT – PHASE 4,” dated August 2017 and stamped as received by our office on November 6, 2017 satisfies the terms and conditions of Corps Nationwide Permit 12 (NWP-12). The Corps Nationwide Permits were published in the January 6, 2017, Federal Register notice (82 FR 1860) and the regulations governing their use can be found in 33 CFR 330 published in Volume 56, Number 226 of the Federal Register dated November 22, 1991.

Special Conditions:

1. In order to compensate for the permanent conversion of 0.397 acres of PFO and PSS wetlands, Spotsylvania County Department of Utilities will purchase 0.397 wetland credits from approved mitigation banks in the Lower Rappahannock sub-basin (HUC 02080104). The mitigation credits will be purchased and documentation of the purchase will be provided to the Corps prior to the commencement of the authorized activity.

2. All conditions stipulated in the Programmatic Agreement (PA), dated March 16, 2011 and amended November 2014, shall be followed by the Spotsylvania County Department of Utilities throughout the project duration.
Provided the project specific conditions (above) and the Nationwide Permit General Conditions (enclosed) are met, an individual Department of the Army Permit will not be required. In addition, the Virginia Department of Environmental Quality has provided a conditional §401 Water Quality Certification for Nationwide Permit 12. A permit may be required from the Virginia Marine Resources Commission and/or your local wetlands board, and this verification is not valid until you obtain their approval, if necessary. This authorization does not relieve your responsibility to comply with local requirements pursuant to the Chesapeake Bay Preservation Act (CBPA), nor does it supersede local government authority and responsibilities pursuant to the Act. You should contact your local government before you begin work to find out how the CBPA applies to your project.

Enclosed is a "compliance certification" form, which must be signed and returned within 30 days of completion of the project, including any required mitigation. Your signature on this form certifies that you have completed the work in accordance with the nationwide permit terms and conditions.

This verification is valid until the NWP is modified, reissued, or revoked. All of the existing NWPs are scheduled to be modified, reissued, or revoked prior to March 18, 2022. It is incumbent upon you to remain informed of changes to the NWPs. We will issue a public notice when the NWPs are reissued. Furthermore, if you commence or are under contract to commence this activity before the date that the relevant nationwide permit is modified or revoked, you will have twelve (12) months from the date of the modification or revocation of the NWP to complete the activity under the present terms and conditions of this nationwide permit unless discretionary authority has been exercised on a case-by-case basis to modify, suspend, or revoke the authorization in accordance with 33 CFR 330.4(e) and 33 CFR 330.5 (c) or (d). Project specific conditions listed in this letter continue to remain in effect after the NWP verification expires, unless the district engineer removes those conditions. Activities completed under the authorization of an NWP which was in effect at the time the activity was completed continue to be authorized by that NWP.

In granting an authorization pursuant to this permit, the Norfolk District has relied on the information and data provided by the permittee. If, subsequent to notification by the Corps that a project qualifies for this permit, such information and data prove to be materially false or materially incomplete, the authorization may be suspended or revoked, in whole or in part, and/or the Government may institute appropriate legal proceedings.

If you have any questions and/or concerns about this permit authorization, please contact Brittany Dunn, of my staff, via telephone at (757) 201-7029 or via email at brittany.n.dunn@usace.army.mil.
Sincerely,
BRONSON.REGEN
A.D.1094003608
FOR
Tucker Smith
Chief, Northern Virginia
Regulatory Section

Enclosure(s)
  "MASSAPONAX INTERCEPTOR REPLACEMENT – PHASE 4" Drawing
  Compliance Certificate
  Nationwide Permit 12 (NWP-12)

Cc:  David Kwasniewski
     Virginia Marine Resources Commission
     Spotsylvania County Wetlands Board
EXCAVATED AREA TO BE RESTORED TO ORIGINAL CONTOURS WITH ORIGINAL 6" TO 12" TOPSOIL MATERIAL

ENTIRE STREAM CHANNEL BOTTOM TO BE RESTORED TO ORIGINAL CONTOURS WITH 12"-18" ORIGINAL STREAMBED MATERIAL

OHWL – ORDINARY HIGH WATER LEVEL

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<th>PLATE NO.</th>
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<th>APPROX. STA. NO.</th>
<th>STREAM</th>
<th>APPROX. D. A.</th>
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<tr>
<td>5</td>
<td>18</td>
<td>28+25</td>
<td>UNNAMED TRIBUTARY</td>
<td>55 ACRES</td>
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<td>UNNAMED TRIBUTARY</td>
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CROSS SECTION
MINOR TRIBUTARY CROSSING
SCALE: N.T.S.

Applicant: SPOTSYLVANIA COUNTY
Department Of Utilities

Project Name: MASSAPONAX INTERCEPTOR REPLACEMENT - PHASE 4

Location: County of Spotsylvania, Virginia

Date: August 2017
Plate: 15 of 17
Excavated area to be restored to original contours with original 4" to 6" topsoil material.

The vertical limit of riprap shall not exceed more than half the bank height.

Entire stream channel bottom to be restored to original contours with 12"-18" original streambed material.

Stone toe protection (foot class 1 riprap) will be kept to original bank location and slope with minimum channelward encroachment.

**NOTE:**

1. The length of stream bank stabilization required along centerline of stream shall be the length of bank disturbed during trench construction.

<table>
<thead>
<tr>
<th>PLATE NO.</th>
<th>IMPACT NO.</th>
<th>APPROX. STA. NO.</th>
<th>STREAM</th>
<th>APPROX. D.A.</th>
<th>CU. YDS. FILL BELOW OHW</th>
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<tr>
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<td>1</td>
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<td>UNNAMED TRIBUTARY</td>
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**CROSS SECTION**

**MAJOR STREAM CROSSING**

Scale: N.T.S.

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Applicant: SPOTSYLVANIA COUNTY
Department Of Utilities

Project Name: MASSAPONAX INTERCEPTOR REPLACEMENT - PHASE 4

Location: County of Spotsylvania, Virginia

Date: August 2017

Plate: 16 of 17
EXCAVATED AREA TO BE RESTORED TO ORIGINAL CONTOURS WITH ORIGINAL 4" TO 6" TOPSOIL MATERIAL.

THE VERTICAL LIMIT OF RIPPED SHALL NOT EXCEED MORE THAN HALF THE BANK HEIGHT.

ENTIRE STREAM CHANNEL BOTTOM TO BE RESTORED TO ORIGINAL CONTORMS WITH 12"-18" ORIGINAL STREAMBED MATERIAL.

NOTE:
1. THE LENGTH OF STREAM BANK STABILIZATION REQUIRED ALONG CENTERLINE OF STREAM SHALL BE THE LENGTH OF BANK DISTURBED DURING TRENCH CONSTRUCTION.

<table>
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<tr>
<th>PLATE NO</th>
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<td>6</td>
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CROSS SECTION
MAJOR STREAM CROSSING
SCALE: N.T.S.

Applicant: SPOTSYLVANIA COUNTY
Department Of Utilities

Project Name: MASSAPONAX INTERCEPTOR REPLACEMENT - PHASE 4
Location: County of Spotsylvania, Virginia

Scale: As Noted
Date: August 2017
Plate: 16A of 17
EXCAVATED AREA TO BE RESTORED TO ORIGINAL CONTOURS WITH ORIGINAL 4" TO 6" TOPSOIL MATERIAL

THE VERTICAL LIMIT OF RIPRAP SHALL NOT EXCEED MORE THAN HALF THE BANK HEIGHT

ENTIRE STREAM CHANNEL BOTTOM TO BE RESTORED TO ORIGINAL CONTOURS WITH 12"–18" ORIGINAL STREAMBED MATERIAL

NOTE:
1. THE LENGTH OF STREAM BANK STABILIZATION REQUIRED ALONG CENTERLINE OF STREAM SHALL BE THE LENGTH OF BANK DISTURBED DURING TRENCH CONSTRUCTION.

<table>
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<td>8</td>
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<td>56+50</td>
<td>MASSAPONAX CREEK</td>
<td>490 ACRES</td>
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CROSS SECTION
MAJOR STREAM CROSSING
SCALE: N.T.S.

Applicant: SPOTSYLVANIA COUNTY Department Of Utilities
Project Name: MASSAPONAX INTERCEPTOR REPLACEMENT - PHASE 4
Location: County of Spotsylvania, Virginia

Scale: As Noted
Date: August 2017
Plate: 16 B of 17
**WETLAND CONSTRUCTION NOTES**

1. CONTRACTOR SHALL BE RESPONSIBLE TO ENSURE THAT THE WIDTH OF DISTURBANCE THROUGH WETLANDS WITHIN THE LIMITS OF DISTURBANCE DOES NOT EXCEED LIMITS SET BY THE US ARMY CORPS OF ENGINEERS.

2. PRIOR TO ANY CONSTRUCTION ACTIVITIES, THE CONTRACTOR SHALL MARK THE LIMITS OF DISTURBANCE THROUGH ALL WETLANDS. MARKING SHALL BE BY MATERIAL APPROVED BY THE COUNTY.

3. IN WETLANDS, CONTRACTOR SHALL USE LOW GROUND PRESSURE EQUIPMENT OR UTILIZE MATS, LOGS, OR OTHER APPROVED ALTERNATIVES UNDER EQUIPMENT TO MINIMIZE DISTURBANCE OF SOILS.

4. ANY STANDING TIMBER IN WETLANDS WITHIN THE LIMITS OF DISTURBANCE SHALL BE CUT DOWN AT GROUND LEVEL.

5. WITHIN WETLANDS, ONLY THOSE STUMPS THAT ARE WITHIN THE PERMANENT EASEMENT SHALL BE GRUBBED AND REMOVED FROM THE SITE. STUMPS WITHIN TEMPORARY CONSTRUCTION EASEMENT SHALL BE LEFT IN THE GROUND.

6. EXCAVATED MATERIAL RESULTING FROM THE UTILITY LINE CONSTRUCTION MAY BE TEMPORARILY SIDECAST INTO WETLANDS FOR NO MORE THAN 30 DAYS, PROVIDED THAT THE MATERIAL IS NOT PLACED IN SUCH A MANNER THAT IT IS DISPERSED BY CURRENTS OR OTHER FORCES.

7. ALL EXCAVATED MATERIAL STOCKPILED IN WETLANDS SHALL BE PLACED ON FILTER CLOTH, MATS, OR OTHER SEMI-PERMEABLE SURFACE. THE EXCAVATED MATERIAL SHALL BE STABILIZED WITH STRAW BALES, SILT FENCING, OR OTHER APPROVED MATERIALS TO PREVENT RE-ENTRY TO WATERWAYS.

8. STUMPS, BRUSH, AND LIMBS SHALL NOT BE DISPOSED OF OR STOCKPILED IN WETLANDS.

9. IN WETLANDS, THE TOP 6 TO 12 INCHES OF TOPSOIL EXCAVATED FOR THE TRENCH SHALL BE STOCKPILED SEPARATELY FROM OTHER MATERIALS.

10. IN WETLANDS, THE TOP 6 TO 12 INCHES OF THE TRENCH SHALL BE FILLED WITH THE WETLAND TOPSOIL ORIGINALLY EXCAVATED FROM THE TRENCH. ALL EXCAVATED MATERIALS MUST BE PLACED IN THE TRENCH TO THE ORIGINAL CONTOURS AND ALL EXCESS MATERIALS REMOVED FROM THE WETLANDS WITHIN 30 DAYS OF COMPLETION OF THE UTILITY LINE CONSTRUCTION.

11. AT THE COMPLETION OF WORK ALL DISTURBED WETLANDS SHALL BE SEEDED WITH A WETLAND SEED MIX AS INDICATED ON THIS SHEET.

**STREAM CROSSING CONSTRUCTION NOTES**

1. CONTRACTOR SHALL BE RESPONSIBLE TO ENSURE THAT THE WIDTH OF DISTURBANCE THROUGH STREAMS WITHIN THE LIMITS OF DISTURBANCE DOES NOT EXCEED LIMITS SET BY THE US ARMY CORPS OF ENGINEERS.

2. PRIOR TO ANY CONSTRUCTION ACTIVITIES, THE CONTRACTOR SHALL MARK THE LIMITS OF DISTURBANCE ALONG THE BANKS OF THE STREAM. MARKING SHALL BE BY MATERIAL APPROVED BY THE COUNTY.

3. IN STREAM CROSSINGS, CONTRACTOR SHALL USE APPROVED METHODS TO CONSTRUCT THE TRENCH AND PROVIDE ACCESS OVER THE STREAM CHANNEL.

4. EXCAVATED MATERIAL RESULTING FROM THE UTILITY LINE CONSTRUCTION MAY NOT BE SIDECAST INTO STREAMS.

5. STUMPS, BRUSH, AND LIMBS SHALL NOT BE DISPOSED OF OR STOCKPILED IN STREAMS.

6. IN STREAMS, THE TOP 12 TO 18 INCHES OF THE TRENCH SHALL BE FILLED WITH THE STREAMBED MATERIAL ORIGINALLY EXCAVATED FROM THE TRENCH. ALL EXCAVATED MATERIALS MUST BE PLACED IN THE TRENCH TO THE ORIGINAL CONTOURS.

7. STREAM BANK SHALL BE RESTORED AS INDICATED IN THE PLANS, INCLUDING GRADING, MATTING, AND SEEDING.

**SEEDING NOTES**

- **WETLAND SEEDING:** ALL DISTURBED WETLANDS WITHIN THE LOD SHALL BE SEEDED WITH A WETLANDS SEED MIX AT A RATE OF 20 POUNDS PER ACRE (0.5 LBS. PER 1,000 SF). THE MIX SHALL BE VIRGINIA OUTD COASTAL PLAIN FACW MIX (ERNMS–895) FROM ERNST CONSERVATION SEEDS (WWW.ERNSTSEED.COM), OR EQUIVALENT. SEEDING SHALL BE INSTALLED AT TIME OF FINAL GRADING.

- **STREAM BANK SEEDING:** ALL DISTURBED STREAM BANKS WITHIN THE LOD SHALL BE SEEDED WITH A RIPARIAN SEED MIX AT A RATE OF 40 POUNDS PER ACRE (1.0 LBS. PER 1,000 SF). THE MIX SHALL BE VIRGINIA OUTER COASTAL PLAIN RIPARIAN MIX (ERNMS–892) FROM ERNST CONSERVATION SEEDS (WWW.ERNSTSEED.COM), OR EQUIVALENT. SEEDING SHALL BE INSTALLED UNDER STABILIZATION MATTING.

- **TEMPORARY STABILIZATION SEEDING:** ALL DISTURBED WETLANDS AND STREAM BANKS SHALL BE STABILIZED WITH ANNUAL RYE, CEREAL RYE, OR OATS AT A RATE OF 20 POUNDS PER ACRE (0.5 LBS. PER 1,000 SF). SEEDING SHALL BE INSTALLED AT THE SAME TIME AS WETLAND SEEDING AND STREAM BANK SEEDING.

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**Table: Application Details**

<table>
<thead>
<tr>
<th>Applicant:</th>
<th>SPOTSYLVANIA COUNTY Department Of Utilities</th>
</tr>
</thead>
<tbody>
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<td>Project Name:</td>
<td>MASSAPONAX INTERCEPTOR REPLACEMENT - PHASE 4</td>
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<tr>
<td>Location:</td>
<td>County of Spotsylvania, Virginia</td>
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<tr>
<td>Scale:</td>
<td>As Noted</td>
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<tr>
<td>Date:</td>
<td>August 2017</td>
</tr>
<tr>
<td>Plate:</td>
<td>17 of 17</td>
</tr>
</tbody>
</table>
CERTIFICATE OF COMPLIANCE WITH ARMY CORPS OF ENGINEERS PERMIT

Permit Number: NAO-2014-00667
VMRC Number: 17-1936

Corps Contact: Brittany Dunn

Name of Permittee: Spotsylvania County Department of Utilities

Date of Issuance: January 25, 2018

Permit Type: Corps Nationwide Permit 12 (NWP-12)

Within 30 days of completion of the activity authorized by this permit and any mitigation required by the permit, sign this certification and return it to the following address:

US Army Corps of Engineers - Norfolk District
CENAO-WR-R
Attn: Brittany Dunn
803 Front Street
Norfolk, VA 23510-1096

Or scan and send via email to brittany.n.dunn@usace.army.mil

Please note that your permitted activity is subject to a compliance inspection by a U.S. Army Corps of Engineers representative. If you fail to comply with this permit you are subject to permit suspension, modification or revocation.

I hereby certify that the work authorized by the above referenced permit has been completed in accordance with the terms and conditions of the said permit, and required mitigation has been completed in accordance with the permit conditions.

______________________________   _____________________________
Signature of Permittee    Date

Digitally signed by
DUNN.BRITTANY.N.1513285520
DN: c=US, o=U.S. Government, ou=DoD, ou=PKI, ou=USA, cn=DUNN.BRITTANY.N.1513285520
Date: 2018.01.25 11:23:18 -05'00'
Nationwide Permit (12) Utility Line Activities.
Effective 3/19/2017
Expires 3/18/2022

Activities required for the construction, maintenance, repair, and removal of utility lines and associated facilities in waters of the United States, provided the activity does not result in the loss of greater than 1/2-acre of waters of the United States for each single and complete project.

Utility lines: This NWP authorizes discharges of dredged or fill material into waters of the United States and structures or work in navigable waters for crossings of those waters associated with the construction, maintenance, or repair of utility lines, including outfall and intake structures. There must be no change in pre-construction contours of waters of the United States. A “utility line” is defined as any pipe or pipeline for the transportation of any gaseous, liquid, liquecent, or slurry substance, for any purpose, and any cable, line, or wire for the transmission for any purpose of electrical energy, telephone, and telegraph messages, and internet, radio, and television communication. The term “utility line” does not include activities that drain a water of the United States, such as drainage tile or french drains, but it does apply to pipes conveying drainage from another area.

Material resulting from trench excavation may be temporarily sidecast into waters of the United States for no more than three months, provided the material is not placed in such a manner that it is dispersed by currents or other forces. The district engineer may extend the period of temporary side casting for no more than a total of 180 days, where appropriate. In wetlands, the top 8 to 12 inches of the trench should normally be backfilled with topsoil from the trench. The trench cannot be constructed or backfilled in such a manner as to drain waters of the United States (e.g., backfilling with extensive gravel layers, creating a french drain effect). Any exposed slopes and stream banks must be stabilized immediately upon completion of the utility line crossing of each waterbody.

Utility line substations: This NWP authorizes the construction, maintenance, or expansion of substation facilities associated with a power line or utility line in non-tidal waters of the United States, provided the activity, in combination with all other activities included in one single and complete project, does not result in the loss of greater than 1/2-acre of waters of the United States. This NWP does not authorize discharges into non-tidal wetlands adjacent to tidal waters of the United States to construct, maintain, or expand substation facilities.

Foundations for overhead utility line towers, poles, and anchors: This NWP authorizes the construction or maintenance of foundations for overhead utility line towers, poles, and anchors in all waters of the United States, provided the foundations are the minimum size necessary and separate footings for each tower leg (rather than a larger single pad) are used where feasible.

Access roads: This NWP authorizes the construction of access roads for the construction and maintenance of utility lines, including overhead power lines and utility line substations, in non-tidal waters of the United States, provided the activity, in combination with all other activities included in one single and complete project, does not cause the loss of greater than 1/2-acre of non-tidal waters of the United States. This NWP does not authorize discharges into non-tidal wetlands adjacent to tidal waters for access roads. Access roads must be the minimum width necessary (see Note 2, below). Access roads must be constructed so that the length of the road minimizes any adverse effects on waters of the United States and must be as near as possible to pre-construction contours and elevations (e.g., at grade corduroy roads or geotextile/gravel roads). Access roads constructed above pre-construction contours and elevations in waters of the United States must be properly bridged or culverted to maintain surface flows.

This NWP may authorize utility lines in or affecting navigable waters of the United States even if there is no associated discharge of dredged or fill material (See 33 CFR part 322). Overhead utility lines constructed over section 10 waters and utility lines that are routed in or under section 10 waters without a discharge of dredged or fill material require a section 10 permit.

This NWP authorizes, to the extent that Department of the Army authorization is required, temporary structures, fills, and work necessary for the remediation of inadvertent returns of drilling fluids to waters of the United States through sub-soil fissures or fractures that might occur during horizontal directional drilling activities conducted for the purpose of installing or replacing utility lines. These remediation activities must be done as soon as practicable, to restore the affected waterbody. District engineers may add special conditions to this NWP to require a remediation plan for addressing inadvertent returns of drilling fluids to waters of the United States during horizontal directional drilling activities conducted for the purpose of installing or replacing utility lines.

This NWP also authorizes temporary structures, fills, and work, including the use of temporary mats, necessary to conduct the utility line activity. Appropriate measures must be taken to maintain normal downstream flows and minimize flooding to the maximum extent practicable, when temporary structures, work, and discharges, including cofferdams, are necessary for construction activities, access fills, or dewatering of construction sites. Temporary fills must consist of materials, and be placed in a manner, that will not be eroded by expected high flows. After construction, temporary fills must be removed in their entirety and the affected areas returned to pre-construction elevations. The areas affected by temporary fills must be revegetated, as appropriate.

Notification: The permittee must submit a pre-construction notification to the district engineer prior to commencing the activity if any of the following criteria are met: (1) the activity involves mechanized land clearing in a forested wetland for the utility line right-of-way; (2) a section 10 permit is required; (3) the utility line in waters of the United States, excluding overhead lines, exceeds 500 feet; (4) the utility line is placed within a jurisdictional area (i.e., water of the United States), and it runs parallel to or along a stream bed that is within that jurisdictional area; (5) discharges that result in the loss of greater than 1/10-acre of waters of the United States; (6) permanent access roads are constructed.
above grade in waters of the United States for a distance of more than 500 feet; or (7) permanent access roads are constructed in waters of the United States with impervious materials. (See general condition 32.)

Note 1: Where the utility line is constructed or installed in navigable waters of the United States (i.e., section 10 waters) within the coastal United States, the Great Lakes, and United States territories, a copy of the NWP verification will be sent by the Corps to the National Oceanic and Atmospheric Administration (NOAA), National Ocean Service (NOS), for charting the utility line to protect navigation.

Note 2: For utility line activities crossing a single waterbody more than one time at separate and distant locations, or multiple waterbodies at separate and distant locations, each crossing is considered a single and complete project for purposes of NWP authorization. Utility line activities must comply with 33 CFR 330.6(d).

Note 3: Utility lines consisting of aerial electric power transmission lines crossing navigable waters of the United States (which are defined at 33 CFR part 328) must comply with the applicable minimum clearances specified in 33 CFR 322.5(i).

Note 4: Access roads used for both construction and maintenance may be authorized, provided they meet the terms and conditions of this NWP. Access roads used solely for construction of the utility line must be removed upon completion of the work, in accordance with the requirements for temporary fills.

Note 5: Pipes or pipelines used to transport gaseous, liquid, liquefied, or slurry substances over navigable waters of the United States are considered to be bridges, not utility lines, and may require a permit from the U.S. Coast Guard pursuant to section 9 of the Rivers and Harbors Act of 1899. However, any discharges of dredged or fill material into waters of the United States associated with such pipelines will require a section 404 permit (see NWP 15).

Note 6: This NWP authorizes utility line maintenance and repair activities that do not qualify for the Clean Water Act section 404(f) exemption for maintenance of currently serviceable fills or fill structures.

Note 7: For overhead utility lines authorized by this NWP, a copy of the PCN and NWP verification will be provided to the Department of Defense Siting Clearinghouse, which will evaluate potential effects on military activities.

Note 8: For NWP 12 activities that require pre-construction notification, the PCN must include any other NWP(s), regional general permit(s), or individual permit(s) used or intended to be used to authorize any part of the proposed project or any related activity, including other separate and distant crossings that require Department of the Army authorization but do not require pre-construction notification (see paragraph (b) of general condition 32). The district engineer will evaluate the PCN in accordance with Section D, “District Engineer’s Decision.” The district engineer may require mitigation to ensure that the authorized activity results in no more than minimal individual and cumulative adverse environmental effects (see general condition 23).

Authority: Section 10 of the Rivers and Harbors Act of 1899 and section 404 of the Clean Water Act (Sections 10 and 404)

REGIONAL CONDITIONS:

1. Conditions for Waters Containing Submerged Aquatic Vegetation (SAV) Beds: This condition applies to: NWPs 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 22, 23, 25, 27, 28, 29, 31, 32, 33, 35, 36, 37, 38, 39, 44, 45, 48, 52, 53 and 54. A pre-construction notification (PCN) is required if work will occur in areas that contain submerged aquatic vegetation (SAV). Information about SAV habitat can be found at the Virginia Institute of Marine Science’s website http://web.vims.edu/bio/sav/. Additional avoidance and minimization measures, such as relocating a structure or time-of-year restrictions (TOYR), may be required to reduce impacts to SAV habitat.

2. Conditions for Anadromous Fish Use Areas: To ensure that activities authorized by any NWP do not impact documented spawning habitat or a migratory pathway for anadromous fish, a check for anadromous fish use areas must be conducted via the Norfolk District’s Regulatory GIS (for reporting permits) and/or the Virginia Department of Game and Inland Fisheries (VDGIF) Information System (by applicant for non-reporting permits) at http://vafwis.org/hwa/. For any proposed NWP, if the project is located in an area documented as an anadromous fish use area (confirmed or potential), a time-of-year restriction (TOYR) prohibiting all in-water work will be required from February 15 to June 30 of any given year or any TOYR specified by VDGIF and/or Virginia Marine Resources Commission (VMRC). For permits requiring a PCN, if the Norfolk District determines that the work is minimal and the TOYR is unnecessary, informal consultation will be conducted with NOAA Fisheries Service (NOAA) to obtain concurrence that the TOYR would not be required for the proposed activity. For dredging in the Elizabeth River upstream of the Mid-Town Tunnel on the mainstem and the West Norfolk Bridge (Route 164, Western Freeway) on the Western Branch of the Elizabeth River, a TOYR is not required.

3. Conditions for Designated Critical Resource Waters, which include National Estuarine Research Reserves: Notification is required for work under NWPs 3, 8, 10, 13, 15, 18, 19, 22, 23, 25, 27, 28, 30, 33, 34, 36, 37, 38 and 54 in the Chesapeake Bay National Estuarine Research Reserve in Virginia. This multi-site system along a salinity gradient of the York River includes Sweet Hall Marsh, Taskinas Creek, Catlett Islands, and Goodwin Islands. More information can be found at: http://www.vims.edu/cbnerr/. NWPs 7, 12, 14, 16, 17, 21, 29, 31, 35, 39, 40, 42, 43, 44, 49, 50, 51, and 52 cannot be used to authorize the discharge of dredged or fill material in the Chesapeake Bay National Estuarine Research Reserve in Virginia.

4. Conditions for Federally Listed Species and Designated Critical Habitat: For ALL NWPs, notification is required for any project that may affect a federally listed threatened or endangered species or designated critical habitat. The U.S.
Fish and Wildlife Service (Service) has developed an online system that allows users to find information about sensitive resources that may occur within the vicinity of a proposed project. This system is named “Information, Planning and Conservation System,” (IPaC), and is located at: http://ecos.fws.gov/ipac/. The applicant may use IPaC to determine if any federally listed species or designated critical habitat may be affected by their proposed project. If your Official Species List from IPaC identifies any federally listed endangered or threatened species, you are required to submit a PCN for the proposed activity, unless the project clearly does not impact a listed species or suitable habitat for the listed species. If you are unsure about whether your project will impact listed species, please submit a PCN, so the Norfolk District may review the action. Further information about the Virginia Field Office “Project Review Process” may be found at: http://www.fws.gov/northeast/virginiafield/endangered/projectreviews.html. Additional consultation may also be required with National Marine Fisheries Service for species or critical habitat under their jurisdiction, including sea turtles, marine mammals, shortnose sturgeon, and Atlantic sturgeon. For additional information about their jurisdiction in Virginia, please see https://www.greateratlantic.fisheries.noaa.gov/protected/index.html. Additional resources to assist in determining compliance with this condition can be found on our webpage: http://www.nao.usace.army.mil/Missions/Regulatory/USFWS.aspx

5. **Conditions for Waters with Federally Listed Endangered or Threatened Species. Waters Federally Designated as Critical Habitat, and One-mile Upstream (including tributaries) of Any Such Waters:** Any work proposed in critical habitat, as designated in regional condition 4, requires a PCN.

6. **Conditions for Designated Trout Waters:** Notification is required for work in the areas listed below for NWP's 3, 4, 5, 6, 7, 12, 13, 14, 16, 17, 18, 19, 21, 23, 25, 29, 30, 31, 32, 33, 34, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 49, 50, 51, 52, 53, and 54. This condition applies to activities occurring in two categories of waters; Class V (Put and Take Trout Waters) and Class VI (Natural Trout Waters), as defined by the Virginia State Water Control Board Regulations, Water Quality Standards (VR-680-21-00), dated January 1, 1981, or the most recently updated publication. The Virginia Department of Game and Inland Fisheries (VDGIF) designated these same trout streams into six classes. Classes I-IV are considered wild trout streams. Classes V and VI are considered stockable trout streams. Information on designated trout streams can be obtained via their Virginia Fish and Wildlife Information Service's (VAFWIS's) Cold Water Stream Survey database. Basic access to the VAFWIS is available via http://vafwis.org/vwis/. The waters, occurring specifically within the mountains of Virginia, are within the following river basins:
   1) Potomac-Shenandoah River Basins
   2) James River Basin
   3) Roanoke River Basin
   4) New River Basin
   5) Tennessee and Big Sandy River Basins
   6) Rappahannock River Basin

VDGIF recommends the following time-of-year restrictions (TOYRs) for any in-stream work within streams identified as wild trout waters in its Cold Water Stream Survey database. The recommended TOYRs for trout species are:

- **Brook Trout:** October 1 through March 31
- **Brown Trout:** October 1 through March 31
- **Rainbow Trout:** March 15 through May 15

This condition applies to the following counties and cities: Albemarle, Allegheny, Amherst, Augusta, Bath, Bedford, Bland, Botetourt, Bristol, Buchanan, Buena Vista, Carroll, Clarke, Covington, Craig, Dickenson, Floyd, Franklin, Frederick, Giles, Grayson, Greene, Henry, Highland, Lee, Loudoun, Madison, Montgomery, Nelson, Page, Patrick, Pulaski, Rappahannock, Roanoke City, Roanoke Co., Rockbridge, Rockingham, Russell, Scott, Shenandoah, Smyth, Staunton, Tazewell, Warren, Washington, Waynesboro, Wise, and Wythe. Any discharge of dredged and/or fill material authorized by the NWPs listed above, which would occur in the designated waterways or adjacent wetlands of the specified counties, requires notification to the appropriate Corps of Engineers field office, and written approval from that office prior to performing the work. The Norfolk District recommends that prospective permittees first contact the applicable Norfolk District Field Office, found at this web link: http://www.nao.usace.army.mil/Missions/Regulatory/Contacts.aspx, to determine if the PCN procedures would apply. The notification must be in writing and include the following information (the standard Joint Permit Application may also be used):

- Name, address, and telephone number of the prospective permittee.
- Name, address, email, and telephone number of the property owner.
- Location of the proposed project.
- Vicinity map and project drawings on 8.5-inch by 11-inch paper (plan view, profile, & cross-sectional view).
- Brief description of the proposed project and the project purpose.
- Where required by the terms of the nationwide permit, a delineation of affected special aquatic sites, including wetlands.

When all required information is received by the appropriate field office, the Corps will notify the prospective permittee within 45 days whether the project can proceed under the NWP or whether an individual permit is required. If, after reviewing the PCN, the District Commander determines that the proposed activity would have more than minimal individual or cumulative adverse impacts on the aquatic environment or otherwise may be contrary to the public interest, then he/she will either condition the nationwide permit authorization to reduce or eliminate the adverse impacts, or notify the prospective permittee that the activity is not authorized by the NWP and provide instructions on how to seek authorization under an individual permit. If the prospective permittee is not notified otherwise within the 45-day period, the prospective permittee may assume that the project can proceed under the NWP.

7. **Conditions Regarding Invasive Species:** Plant species listed by the most current Virginia Department of Conservation and Recreation’s Invasive Alien Plant List shall not be used for re-vegetation for activities authorized by any NWP. The list of invasive plants in Virginia may be found at: http://www.dcr.virginia.gov/natural-heritage/invsppdflist. DCR recommends the use of regional native species for re-vegetation as identified in the DCR Native Plant List.
8. Conditions Pertaining to Countersinking of Pipes and Culverts: This condition applies to NWPs 3, 7, 12, 14, 17, 18, 21, 23, 25, 27, 29, 32, 33, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 49, 50, 51, and 52. NOTE: COUNTERSINKING IS NOT REQUIRED IN TIDAL WATERS. However, replacement pipes/culverts in tidal waters must be installed with invert elevations no higher than the existing pipe/culvert invert elevation, and a new pipe/culvert must be installed with the invert no higher than the stream bottom elevation. For Nontidal Waters: Following consultation with the Virginia Department of Game and Inland Fisheries (VDGIF), the Norfolk District has determined that fish and other aquatic organisms are most likely present in any stream being crossed, in the absence of site-specific evidence to the contrary. Although prospective permittees have the option of providing such evidence, extensive efforts to collect such information is not encouraged, since countersinking will in most cases be required except as outlined in the conditions below. The following conditions will apply in nontidal waters:

a. All pipes: All pipes and culverts placed in streams will be countersunk at both the inlet and outlet ends, unless indicated otherwise by the Norfolk District on a case-by-case basis (see below). Pipes that are 24" or less in diameter shall be countersunk 3" below the natural stream bottom. Pipes that are greater than 24" in diameter shall be countersunk 6" below the natural stream bottom. The countersinking requirement does not apply to bottomless pipes/culverts or pipe arches. All single pipes or culverts (with bottoms) shall be depressed (countersunk) below the natural streambed at both the inlet and outlet of the structure. In sets of multiple pipes or culverts (with bottoms) at least one pipe or culvert shall be depressed (countersunk) at both the inlet and outlet to convey low flows.

b. When countersinking culverts, permittees must ensure reestablishment of a surface water channel (within 15 days post construction) that allows for the movement of aquatic organisms and maintains the same hydrologic regime that was present pre-construction (i.e. the depth of surface water through the permit area should match the upstream and downstream depths). This may require the addition of finer materials to choke the larger stone and/or placement of riprap to allow for a low flow channel.

c. Exemption for extensions and certain maintenance: The requirement to countersink does not apply to extensions of existing pipes or culverts that are not countersunk, or to maintenance to pipes/culverts that does not involve replacing the pipe/culvert (such as repairing cracks, adding material to prevent/correct scour, etc.).

d. Floodplain pipes: The requirement to countersink does not apply to pipes or culverts that are being placed above ordinary high water, such as those placed to allow for floodplain flows. The placement of pipes above ordinary high water is not jurisdictional (provided no fill is discharged into wetlands).

e. Hydraulic opening: Pipes should be adequately sized to allow for the passage of ordinary high water with the countersinking and invert restrictions taken into account.

f. Pipes on bedrock or above existing utility lines: Different procedures will be followed for pipes or culverts to be placed on bedrock or above existing buried utility lines where it is not practicable to relocate the lines, depending on whether the work is for replacement of an existing pipe/culvert or a new pipe/culvert:

   i. Replacement of an existing pipe/culvert: Countersinking is not required provided the elevations of the inlet and outlet ends of the replacement pipe/culvert are no higher above the stream bottom than those of the existing pipe/culvert. Documentation (photographic or other evidence) must be maintained in the permittee’s records showing the bedrock condition and the existing inlet and outlet elevations. That documentation will be available to the Norfolk District upon request, but notification or coordination with the Norfolk District is not otherwise required.

   ii. A pipe/culvert is being placed in a new location: If the prospective permittee determines that bedrock or an existing buried utility line that is not practicable to relocate prevents countersinking, he/she should evaluate the use of a bottomless pipe/culvert, bottomless vault, span (bridge) or other bottomless structure to cross the waterway, and also evaluate alternative locations for the new pipe/culvert that will allow for countersinking. If the prospective permittee determines that neither a bottomless structure nor an alternative location is practicable, then he/she must submit a pre-construction notification (PCN) to the Norfolk District in accordance with General Condition 32 of the NWPs. In addition to the information required by General Condition 32, the prospective permittee must provide documentation of measures evaluated to minimize disruption of the movement of aquatic life as well as documentation of the cost, engineering factors, and site conditions that prohibit countersinking the pipe/culvert. Options that must be considered include partial countersinking (such as less than 3" of countersinking, or countersinking of one end of the pipe), and constructing stone step pools, low rock weirs downstream, or other measures to provide for the movement of aquatic organisms. The PCN must also include photographs documenting site conditions. The prospective permittee may find it helpful to contact the regional fishery biologist for the VDGIF, for recommendations about the measures to be taken to allow for fish movements. When seeking advice from VDGIF, the prospective permittee should provide the VDGIF biologist with all available information such as location, flow rates, stream bottom features, description of proposed pipe(s), slopes, etc. Any recommendations from VDGIF should be included in the PCN. The Norfolk District will notify the prospective permittee whether the proposed work qualifies for the nationwide permit within 45 days of receipt of a complete PCN. NOTE: Blasting of stream bottoms through the use of explosives is not acceptable as a means of providing for countersinking of pipes on bedrock.

g. Pipes on steep terrain: Pipes being placed on steep terrain (slope of 5% or greater) must be countersunk in accordance with the conditions above.
Emergency pipe replacement: In the case of an emergency situation, such as when a pipe/culvert washes out during a flood or other event, it is encouraged to countersink the replacement pipe at the time of replacement, in accordance with the conditions above. However, if the pipe replacement occurs as a result of the usual wear and tear of the pipe, the permittee will have the option to install the pipe without deepening it if the existing pipe has been replaced without the required countersinking. If the pipe is being replaced due to a natural process such as erosion, the permittee must maintain the natural velocities of the stream, and must provide the permittee's planned schedule for the installation of any new pipes or culverts. The Norfolk District must be notified of all pipes/culverts that are replaced without countersinking, even if these activities are non-reporting activities, and must provide the permittee's planned schedule for the installation of any new pipes or culverts.

9. Conditions for the Replacement of Pipes

i. Replacement pipes/culverts in tidal waters must be installed with invert elevations no higher than the existing pipe/culvert invert elevation, and a new pipe/culvert must be installed if the permittee is not able to maintain the natural velocities of the stream. The permittee must provide the permittee's planned schedule for the installation of any new pipes or culverts, and the Norfolk District will work with the permittee to determine an acceptable plan.

ii. Replacement pipes/culverts in tidal waters must be installed with invert elevations no higher than the existing pipe/culvert invert elevation, and a new pipe/culvert must be installed if the permittee is not able to maintain the natural velocities of the stream. The permittee must provide the permittee's planned schedule for the installation of any new pipes or culverts, and the Norfolk District will work with the permittee to determine an acceptable plan.

iii. The permittee must provide the permittee's planned schedule for the installation of any new pipes or culverts, and the Norfolk District will work with the permittee to determine an acceptable plan.
4) A vicinity map showing the pipe locations. Depending on the specific case, the Norfolk District may discuss potential fish usage of the waterway with the Virginia Department of Game and Inland Fisheries. The Norfolk District will assess all such pipe repair proposals in accordance with guidelines that can be found under “Pipe Repair Guidelines” at http://www.nao.usace.army.mil/Missions/Regulatory/GuidanceDocuments.aspx

iii. If the Norfolk District determines that the work qualifies for the NWP, additional conditions will be placed on the verification. Those conditions can be found at the web link above (in item ii).

iv. If the Norfolk District determines that the work does NOT qualify for the NWP, the applicant will be directed to apply for either Regional Permit 01 (applicable only for Virginia Department of Transportation projects) or an Individual Permit. However, it is anticipated that the applicant will still be required to perform the work such that the waterway is not blocked or restricted to a greater degree than its current conditions.

b. If the existing pipe or at least one pipe in the multi-barrel array of pipes IS countersunk and at least one pipe located in the low flow channel will continue to be countersunk, and no concrete aprons are proposed: No PCN to the Norfolk District is required, unless specified in the NWP Conditions for other reasons, and the permittee may proceed with the work.

c. If the existing pipe or at least one pipe in the multi-barrel array of pipes IS countersunk and no pipe will continue to be countersunk in the low flow channel: This work cannot be performed under the NWPs. The prospective permittee must apply for either a Regional Permit 01 (applicable only for VDOT projects) or an Individual Permit. However, it is anticipated that the prospective permittee will still be required to perform the work such that the waterway is not blocked or restricted more so than its current conditions.

d. In emergency situations, if conditions or timeframes do not allow for compliance with the procedure outlined herein, then the pipe can be temporarily repaired to the condition before the washout. If the temporary repair would require a PCN by the above procedures, the permittee must submit the PCN at the earliest practicable date, but no longer than 15 days after the temporary repair.

10. **Condition for Impacts Requiring a Mitigation Plan:** When a PCN is required, a mitigation plan needs to be submitted when the permanent loss of wetlands exceeds 1/10 acre and/or 300 linear feet of waters of the U.S., unless otherwise stated in the Regional Conditions (see Regional Condition 12).

11. **Condition for Temporary Impacts:** All temporarily disturbed waters and wetlands must be restored to their pre-construction contours within 12 months of commencing the temporary impacts’ construction. Impacts that will not be restored within 12 months (calculated from the start of the temporary impacts’ construction) will be considered permanent, unless otherwise approved by the Corps, and mitigation may be required. Once restored to their natural contours, soil in these areas must be mechanically loosened to a depth of 12 inches and wetland areas must be seeded or sprigged with appropriate native vegetation (see Regional Condition 7 regarding revegetation).

12. **Condition for Transportation Projects Funded in Part or in Total by State or Federal Funds:** For all impacts associated with transportation projects funded in part or in total by local, state or federal funds and requiring a PCN, compensatory mitigation will generally be required for all permanent wetland impacts (including impacts less than 1/10 acre). Therefore, the PCN must include a mitigation plan addressing the proposed compensatory mitigation.

13. **Condition for Projects Requiring Coordination Under Section 408:** General Condition 31 of the NWPs requires that prospective permittees submit a pre-construction notification (PCN) if an NWP activity also requires permission from the Corps pursuant to 33 U.S.C. 408 because it will alter or temporarily or permanently occupy or use a US Army Corps of Engineers (USACE) federally authorized civil works project. For information on the location of Norfolk District projects, prospective permittees are directed to the maps showing the locations of Norfolk District projects located at: http://www.nao.usace.army.mil/Portals/31/docs/regulatory/RPS/PDF/RP-17_Corps_Project_Maps.pdf. If the prospective permittee is uncertain whether the proposed activity might alter or temporarily or permanently occupy or use a Norfolk District federally authorized civil works project, the prospective permittee shall submit a PCN.

14. **Utility Line Activities - Conditions Specific to NWP 12:**

1. Construction of access roads may not result in more than 1/3 acre of impacts to waters of the United States.

2. A PCN is required for discharges associated with the construction of utility line substations that result in the permanent loss of greater than 5000 square feet of waters of the United States.

3. For utility activities requiring a PCN the prospective permittee shall provide the following information:

   a. A map of the entire utility corridor to assist with our completeness determination. The map should include a delineation of all wetlands and waters of the United States within the corridor. Aquatic resource information shall be submitted using the Cowardin Classification System mapping conventions (e.g. PFO, PEM, POW, etc.).

   b. An alternatives analysis, which specifically addresses the following:

      i. Selection of an alignment which avoids and minimizes wetland and stream impacts to the maximum extent practicable. The utility line should make a direct or perpendicular crossing of a stream. Directional drilling should be reviewed as an option. However, the Norfolk District recognizes that in certain areas (e.g. karst areas) directional drilling may not be environmentally preferred option.

      ii. Selection of an alignment which avoids fragmenting large tracts of forested wetlands by routing utility lines outside of forested tracts or on the edges of forested tracts. Consult the Virginia Conservation Vision,

iii. Minimizing clearing of wetlands. Grubbing shall be limited to the permanent easement for underground utility lines. Outside of the permanent easement, wetland vegetation shall only be removed at or above the ground surface unless written justification is provided and the impacts are reviewed and approved by the Corps.

iv. For overhead utility lines, allowance of natural succession to restore and maintain the corridor in scrub-shrub wetlands except for a minimum corridor needed for access, to the maximum extent practicable.

v. For buried utility lines, allowance of natural succession to restore the area to tree and scrub/shrub except for a 20-foot wide access corridor, to the maximum extent practicable.

c. Compensatory mitigation may be required for permanent conversion of wetlands within the utility line corridor.

4. For all submerged utility lines across navigable waters of the United States, a location map and cross-sectional view showing the utility line crossing from bank to bank is required. In addition, the location and depth of any Federal Navigation Channels shall be shown in relation to the proposed utility line. In general, all utility lines shall be buried at least six (6) feet below the authorized bottom depth of Federal Navigation Channel and at least three (3) feet below the bottom depth in all subaqueous areas. When circumstances prevent the placement of at least three feet of cover over the line (outside of the Federal Navigation Channel), then written justification and an alternative method must be provided with the notification and the deviation must be reviewed and approved by the Corps. Section 408 permission may be required (see Regional Condition 13 under Section I).

5. Whenever practicable, excavated material shall be placed on a Corps confirmed upland site. However, when this is not practicable, temporary stockpiling is hereby authorized provided that:

a. All excavated material stockpiled in a vegetated wetland area is placed on filter cloth, mats, or some other semi-permeable surface. The material will be stabilized with straw bales, filter cloth, etc. to prevent reentry into any waterway.

b. All excavated material must be placed back into the trench to the original contour and all excess excavated material must be completely removed from the wetlands within 30 days after the pipeline has been laid through the wetland areas. Permission must be granted by the District Commander or his authorized representatives if the material is to be stockpiled longer than 30 days.

6. When open-cut trenching in designated anadromous fish use areas or hydrostatic testing of a pipeline involving water withdrawals from tidal waters are proposed, the Corps will coordinate with the NOAA Fisheries Service and/or the Virginia Department of Game and Inland Fisheries. Written verification from this office must be received before performing the proposed work. In most cases, the following time-of-year restrictions (TOYRs) will apply:

- James River, at Jamestown Island (Gray’s Creek) downstream to Rt. 17 bridge: TOYR from February 15 through June 15 of any given year.
- James River, at Jamestown Island upstream to Bosher’s Dam: TOYR from February 15 through June 30 of any given year.
- James River, above Bosher’s Dam (including Rivanna River): TOYR from March 15 through June 30 of any given year.
- Rappahannock River, below Route 360 bridge: TOYR from February 15 through June 15 of any given year.
- Nansemond River: TOYR from February 15 through June 15 of any given year.
- Elizabeth River: If dredging upstream of the Mid-Town Tunnel on the mainstem and the West Norfolk Bridge (Route 164, Western Freeway) on the Western Branch of the Elizabeth River, then a TOYR is not required.
- Unless otherwise noted: TOYR from February 15 through June 30 of any given year.

7. Aerial Transmission Lines Crossing Navigable Waters:

a. The following minimum clearances are required for aerial electric power transmission lines crossing navigable waters of the United States. These clearances are related to the clearances over the navigable channel provided by existing fixed bridges, or the clearances which would be required by the United States Coast Guard for new fixed bridges, in the vicinity of the proposed aerial transmission line. These clearances are based on the low point of the line under conditions producing the greatest sag, taking into consideration temperature, load, wind, length of span, and type of supports as outlined in the National Electrical Safety Code:

<table>
<thead>
<tr>
<th>Nominal System Voltage (kV)</th>
<th>Minimum additional clearance (ft.) above clearance required for bridges</th>
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<tr>
<td>115 and below</td>
<td>20</td>
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<td>138</td>
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b. Clearances for communication lines, stream gaging cables, ferry cables, and other aerial crossings must be a minimum of ten feet above clearances...
required for bridges, unless otherwise specifically authorized by the District Engineer.

5. Navigation. (a) No activity may cause more than a minimal adverse effect on navigation.
   (b) Any safety lights and signals prescribed by the U.S. Coast Guard, through regulations or otherwise, must be installed and maintained at the permittee’s expense on authorized facilities in navigable waters of the United States.
   (c) The permittee understands and agrees that, if future operations by the United States require the removal, relocation, or other alteration, of the structure or work herein authorized, or if, in the opinion of the Secretary of the Army or his authorized representative, said structure or work shall cause unreasonable obstruction to the free navigation of the navigable waters, the permittee will be required, upon due notice from the Corps of Engineers, to remove, relocate, or alter the structural work or obstructions caused thereby, without expense to the United States. No claim shall be made against the United States on account of any such removal or alteration.

8. For utility lines landing in Virginia, from the Outer Continental Shelf (OCS), the applicant shall send the PCN to the following federal agencies:
   - Director, Naval Seafloor Cable Protection Office
   - Naval Facilities Engineering Command
   - Bureau of Ocean Energy Management (BOEM)
   - Atlantic OCS Region
   - New Orleans, LA 70123-2394

9. For utility line projects completed by horizontal directional drilling or other boring methods, a plan to address the prevention, containment, and cleanup of sediment or other materials caused by inadvertent returns of drilling fluids to waters of the U.S. through sub-soil fissures or fractures needs to be included with the PCN (if a PCN is required). If an inadvertent return of drilling fluids to waters of the U.S. occurs, and the remediation requires work within waters of the U.S., then the applicant must notify the Corps immediately and submit a remediation plan as soon as possible, regardless of whether a PCN was required for the original work.

10. When an intake is proposed in designated anadromous fish waters, the following design parameters will be incorporated as permit conditions to protect the sensitive life stages of anadromous fish:
    a. Screening over the mouth of the intake with mesh size that does not exceed 1mm;
    b. Intake velocities that do not exceed 0.25 feet per second;
    c. Intake must be positioned such that an unimpeded flow of water parallel to the screen surface occurs along the entire surface of the screen to take advantage of sweeping velocity.

GENERAL CONDITIONS:

Note: To qualify for NWP authorization, the prospective permittee must comply with the following general conditions, as applicable, in addition to any regional or case-specific conditions imposed by the division engineer or district engineer. Prospective permittees should contact the appropriate Corps district office to determine if regional conditions have been imposed on an NWP. Prospective permittees should also contact the appropriate Corps district office to determine the status of Clean Water Act Section 401 water quality certification and/or Coastal authorization under one or more NWPs, or who is currently relying on an existing or prior permit authorization under one or more NWPs, has been and is on notice that all of 33 CFR §§ 330.1 through 330.6 apply to every NWP authorization. Note especially 33 CFR §§ 330.5 relating to the modification, suspension, or revocation of any NWP authorization.

6. Suitable Material. No activity may use unsuitable material (e.g., trash, debris, car bodies, asphalt, etc.). Material used for construction or discharged must be free from toxic pollutants in toxic amounts (see section 307 of the Clean Water Act).

7. Water Supply Intakes. No activity may occur in the proximity of a public water supply intake, except where the activity is for the repair or improvement of public water supply intake structures or adjacent bank stabilization.

8. Adverse Effects from Impoundments. If the activity creates an impoundment of water, adverse effects to the aquatic system due to accelerating the passage of water, and/or restricting its flow must be minimized to the maximum extent practicable.
9. Management of Water Flows. To the maximum extent practicable, the pre-construction course, condition, capacity, and location of open waters must be maintained for each activity, including stream channelization, storm water management activities, and temporary and permanent road crossings, except as provided below. The activity must be constructed to withstand expected high flows. The activity must not restrict or impede the passage of normal or high flows, unless the primary purpose of the activity is to impound water or manage high flows. The activity may alter the pre-construction course, condition, capacity, and location of open waters if it benefits the aquatic environment (e.g., stream restoration or relocation activities).

10. Fills Within 100-Year Floodplains. The activity must comply with applicable FEMA-approved state or local floodplain management requirements.

11. Equipment. Heavy equipment working in wetlands or mudflats must be placed on mats, or other measures must be taken to minimize soil disturbance.

12. Soil Erosion and Sediment Controls. Appropriate soil erosion and sediment controls must be used and maintained in effective operating condition during construction, and all exposed soil and other fills, as well as any work below the ordinary high water mark or high tide line, must be permanently stabilized at the earliest practicable date. Permittees are encouraged to perform work within waters of the United States during periods of low-flow or no-flow, or during low tides.

13. Removal of Temporary Fills. Temporary fills must be removed in their entirety and the affected areas returned to pre-construction elevations. The affected areas must be revegetated, as appropriate.

14. Proper Maintenance. Any authorized structure or fill shall be properly maintained, including maintenance to ensure public safety and compliance with applicable NWP general conditions, as well as any activity-specific conditions added by the district engineer to an NWP authorization.

15. Single and Complete Project. The activity must be a single and complete project. The same NWP cannot be used more than once for the same single and complete project.

16. Wild and Scenic Rivers.
   (a) No NWP activity may occur in a component of the National Wild and Scenic River System, or in a river officially designated by Congress as a “study river” for possible inclusion in the system while the river is in an official study status, unless the appropriate Federal agency with direct management responsibility for such river, has determined in writing that the proposed activity will not adversely affect the Wild and Scenic River designation or study status.
   (b) If a proposed NWP activity will occur in a component of the National Wild and Scenic River System, or in a river officially designated by Congress as a “study river” for possible inclusion in the system while the river is in an official study status, the permittee must submit a pre-construction notification (see general condition 32). The district engineer will coordinate the PCN with the Federal agency with direct management responsibility for that river. The permittee shall not begin the NWP activity until notified by the district engineer that the Federal agency with direct management responsibility for that river has determined in writing that the proposed NWP activity will not adversely affect the Wild and Scenic River designation or study status.
   (c) Information on Wild and Scenic Rivers may be obtained from the appropriate Federal land management agency responsible for the designated Wild and Scenic River or study river (e.g., National Park Service, U.S. Forest Service, Bureau of Land Management, U.S. Fish and Wildlife Service). Information on these rivers is also available at: http://www.rivers.gov/.

17. Tribal Rights. No NWP activity may cause more than minimal adverse effects on tribal rights (including treaty rights), protected tribal resources, or tribal lands.

18. Endangered Species.
   (a) No activity is authorized under any NWP which is likely to directly or indirectly jeopardize the continued existence of a threatened or endangered species or a species proposed for such designation, as identified under the Federal Endangered Species Act (ESA), or which will directly or indirectly destroy or adversely modify the critical habitat of such species. No activity is authorized under any NWP which “may affect” a listed species or critical habitat, unless ESA section 7 consultation addressing the effects of the proposed activity has been completed. Direct effects are the immediate effects on listed species and critical habitat caused by the NWP activity. Indirect effects are those effects on listed species and critical habitat that are caused by the NWP activity and are later in time, but still are reasonably certain to occur.
   (b) Federal agencies should follow their own procedures for complying with the requirements of the ESA. If pre-construction notification is required for the proposed activity, the Federal permittee must provide the district engineer with the appropriate documentation to demonstrate compliance with those requirements. The district engineer will verify that the appropriate documentation has been submitted. If the appropriate documentation has not been submitted, additional ESA section 7 consultation may be necessary for the activity and the respective federal agency would be responsible for fulfilling its obligation under section 7 of the ESA.
   (c) Non-federal permittees must submit a pre-construction notification to the district engineer if any listed species or designated critical habitat might be affected or is in the vicinity of the activity, or if the activity is located in designated critical habitat, and shall not begin work on the activity until notified by the district engineer that the requirements of the ESA have been satisfied and that the activity is authorized. For activities that might affect Federally-listed endangered or threatened species or designated critical habitat, the pre-construction notification must include the name(s) of the endangered or threatened species that might be affected by the proposed activity or that utilize the designated critical habitat that might be affected by the proposed activity. The district engineer will determine whether the proposed activity “may affect” or will have “no effect” to listed species and designated critical habitat and will notify the non-Federal applicant of the Corps’ determination within 45 days of receipt of a complete pre-construction notification. In cases where the non-Federal applicant has identified listed species or critical habitat that might be affected or is in the vicinity of the activity, and has so notified the Corps, the applicant shall not begin work until the Corps has provided notification that the proposed activity will have “no effect” on listed species or critical habitat, or until ESA section 7 consultation has been
completed. If the non-Federal applicant has not heard back from the Corps within 45 days, the applicant must still wait for notification from the Corps.

(d) As a result of formal or informal consultation with the FWS or NMFS the district engineer may add species-specific permit conditions to the NWPs.

(e) Authorization of an activity by an NWP does not authorize the "take" of a threatened or endangered species as defined under the ESA. In the absence of separate authorization (e.g., an ESA Section 10 Permit, a Biological Opinion with "incidental take" provisions, etc.) from the FWS or the NMFS, the Endangered Species Act prohibits any person subject to the jurisdiction of the United States to take a listed species, where "take" means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. The word "harm" in the definition of "take" means an act which actually kills or injures wildlife. Such an act may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering.

(f) If the non-Federal permittee has a valid ESA section 10(a)(1)(B) incidental take permit with an approved Habitat Conservation Plan for a project or a group of projects that includes the proposed NWP activity, the non-Federal applicant should provide a copy of that ESA section 10(a)(1)(B) permit with the PCN required by paragraph (c) of this general condition. The district engineer will coordinate with the agency that issued the ESA section 10(a)(1)(B) permit to determine whether the proposed NWP activity and the associated incidental take were considered in the internal ESA section 7 consultation conducted for the ESA section 10(a)(1)(B) permit. If that coordination results in concurrence from the agency that the proposed NWP activity and the associated incidental take were considered in the internal ESA section 7 consultation for the ESA section 10(a)(1)(B) permit, the district engineer does not need to conduct a separate ESA section 7 consultation for the proposed NWP activity. The district engineer will notify the non-Federal applicant within 45 days of receipt of a complete pre-construction notification whether the ESA section 10(a)(1)(B) permit covers the proposed NWP activity or whether additional ESA section 7 consultation is required.

(g) Information on the location of threatened and endangered species and their critical habitat can be obtained directly from the offices of the FWS and NMFS or their World Wide Web pages at http://www.fws.gov/ or http://www.fws.gov/ipac and http://www.nmfs.noaa.gov/pr/species/esa/ respectively.

19. Migratory Birds and Bald and Golden Eagles. The permittee is responsible for ensuring their action complies with the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act. The permittee is responsible for contacting appropriate local office of the U.S. Fish and Wildlife Service to determine applicable measures to reduce impacts to migratory birds or eagles, including whether "incidental take" permits are necessary and available under the Migratory Bird Treaty Act or Bald and Golden Eagle Protection Act for a particular activity.


(a) In cases where the district engineer determines that the activity may have the potential to cause effects to properties listed, or eligible for listing, in the National Register of Historic Places, the activity is not authorized, until the requirements of Section 106 of the National Historic Preservation Act (NHPA) have been satisfied.

(b) Federal permittees should follow their own procedures for complying with the requirements of section 106 of the National Historic Preservation Act. If pre-construction notification is required for the proposed NWP activity, the Federal permittee must provide the district engineer with the appropriate documentation to demonstrate compliance with those requirements. The district engineer will verify that the appropriate documentation has been submitted. If the appropriate documentation is not submitted, then additional consultation under section 106 may be necessary. The respective federal agency is responsible for fulfilling its obligation to comply with section 106.

(c) Non-Federal permittees must submit a pre-construction notification to the district engineer if the NWP activity might have the potential to cause effects to any historic properties listed on, determined to be eligible for listing on, or potentially eligible for listing on the National Register of Historic Places, including previously unidentified properties. For such activities, the pre-construction notification must state which historic properties might have the potential to be affected by the proposed NWP activity or include a vicinity map indicating the location of the historic properties or the potential for the presence of historic properties. Assistance regarding information on the location of, or potential for, the presence of historic properties can be sought from the State Historic Preservation Office, Tribal Historic Preservation Office, or designated tribal representative, as appropriate, and the National Register of Historic Places (see 33 CFR 330.4(g)). When reviewing pre-construction notifications, district engineers will comply with the current procedures for addressing the requirements of section 106 of the National Historic Preservation Act. The district engineer shall make a reasonable and good faith effort to carry out appropriate identification efforts, which may include background research, consultation, oral history interviews, sample field investigation, and field survey. Based on the information submitted in the PCN and these identification efforts, the district engineer shall determine whether the proposed NWP activity has the potential to cause effects on the historic properties. Section 106 consultation is not required when the district engineer determines that the activity does not have the potential to cause effects on historic properties (see 36 CFR 800.3(a)). Section 106 consultation is required when the district engineer determines that the activity has the potential to cause effects on historic properties. The district engineer will conduct consultation with consulting parties identified under 36 CFR 800.2(c) when he or she makes any of the following effect determinations for the purposes of section 106 of the NHPA: no historic properties affected, no adverse effect, or adverse effect. Where the non-Federal applicant has identified historic properties on which the activity might have the potential to cause effects and so notified the Corps, the non-Federal applicant shall not begin the activity until notified by the district engineer either that the activity has no potential to cause effects to historic properties or that NHPA section 106 consultation has been completed.

(d) For non-Federal permittees, the district engineer will notify the prospective permittee within 45 days of receipt of a complete pre-construction notification whether NHPA section 106 consultation is required. If NHPA section 106 consultation is required, the district engineer will notify the non-Federal applicant that he or she cannot begin the activity until section 106 consultation is completed. If the non-Federal applicant has not heard back from the Corps within 45 days, the applicant must still wait for notification from the Corps.

(e) Prospective permittees should be aware that section 110k of the NHPA (54 U.S.C. 306113) prevents the Corps from granting a permit or other assistance to an applicant who, with intent to avoid the requirements of section 106 of the NHPA, has intentionally significantly adversely affected a historic property to which the permit would relate, or having legal power to prevent it, allowed such significant adverse
effect to occur, unless the Corps, after consultation with the Advisory Council on Historic Preservation (ACHP), determines that circumstances justify granting such assistance despite the adverse effect created or permitted by the applicant. If circumstances justify granting the assistance, the Corps is required to notify the ACHP and provide documentation specifying the circumstances, the degree of damage to the integrity of any historic properties affected, and proposed mitigation. This documentation must include any views obtained from the applicant, SHPO/THPO, appropriate Indian tribes if the undertaking occurs on or affects historic properties on tribal lands or affects properties of interest to those tribes, and other parties known to have a legitimate interest in the impacts to the permitted activity on historic properties.

21. Discovery of Previously Unknown Remains and Artifacts. If you discover any previously unknown historic, cultural or archeological remains and artifacts while accomplishing the activity authorized by this permit, you must immediately notify the district engineer of what you have found, and to the maximum extent practicable, avoid construction activities that may affect the remains and artifacts until the required coordination has been completed. The district engineer will initiate the Federal, Tribal, and state coordination required to determine if the items or remains warrant a recovery effort or if the site is eligible for listing in the National Register of Historic Places.

22. Designated Critical Resource Waters. Critical resource waters include, NOAA-managed marine sanctuaries and marine monuments, and National Estuarine Research Reserves. The district engineer may designate, after notice and opportunity for public comment, additional waters officially designated by a state as having particular environmental or ecological significance, such as outstanding national resource waters or state natural heritage sites. The district engineer may also designate additional critical resource waters after notice and opportunity for public comment.

(a) Discharges of dredged or fill material into waters of the United States are not authorized by NWPs 7, 12, 14, 16, 17, 21, 29, 31, 35, 39, 40, 42, 43, 44, 49, 50, 51, and 52 for any activity within, or directly affecting, critical resource waters, including wetlands adjacent to such waters.

(b) For NWPs 3, 8, 10, 13, 15, 18, 19, 22, 23, 25, 27, 28, 30, 33, 34, 36, 37, 38, and 54, notification is required in accordance with general condition 32, for any activity proposed in the designated critical resource waters including wetlands adjacent to those waters. The district engineer may authorize activities under these NWPs only after it is determined that the impacts to the critical resource waters will be no more than minimal.

23. Mitigation. The district engineer will consider the following factors when determining appropriate and practicable mitigation necessary to ensure that the individual and cumulative adverse environmental effects are no more than minimal:

(a) The activity must be designed and constructed to avoid and minimize adverse effects, both temporary and permanent, to waters of the United States to the maximum extent practicable at the project site (i.e., on site).

(b) Mitigation in all its forms (avoiding, minimizing, rectifying, reducing, or compensating for resource losses) will be required to the extent necessary to ensure that the individual and cumulative adverse environmental effects are no more than minimal.

(c) Compensatory mitigation at a minimum one-for-one ratio will be required for all wetland losses that exceed 1/10-acre and require pre-construction notification, unless the district engineer determines in writing that either some other form of mitigation would be more environmentally appropriate or the adverse environmental effects of the proposed activity are no more than minimal, and provides an activity-specific waiver of this requirement. For wetland losses of 1/10-acre or less that require pre-construction notification, the district engineer may determine on a case-by-case basis that compensatory mitigation is required to ensure that the activity results in only minimal adverse environmental effects.

(d) For losses of streams or other open waters that require pre-construction notification, the district engineer may require compensatory mitigation to ensure that the activity results in no more than minimal adverse environmental effects. Compensatory mitigation for losses of streams should be provided, if practicable, through stream rehabilitation, enhancement, or preservation, since streams are difficult-to-replace resources (see 33 CFR 332.3(e)(3)).

(e) Compensatory mitigation plans for NWP activities in or near streams or other open waters will normally include a requirement for the restoration or enhancement, maintenance, and legal protection (e.g., conservation easements) of riparian areas next to open waters. In some cases, the restoration or maintenance/protection of riparian areas may be the only compensatory mitigation required. Restored riparian areas should consist of native species. The width of the required riparian area will address documented water quality or aquatic habitat loss concerns. Normally, the riparian area will be 25 to 50 feet wide on each side of the stream, but the district engineer may require slightly wider riparian areas to address documented water quality or habitat loss concerns. If it is not possible to restore or maintain/protect a riparian area on both sides of a stream, or if the waterbody is a lake or coastal waters, then restoring or maintaining/protecting a riparian area along a single bank or shoreline may be sufficient. Where both wetlands and open waters exist on the project site, the district engineer will determine the appropriate compensatory mitigation (e.g., riparian areas and/or wetlands compensation) based on what is best for the aquatic environment on a watershed basis. In cases where riparian areas are determined to be the most appropriate form of minimization or compensatory mitigation, the district engineer may waive or reduce the requirement to provide wetland compensatory mitigation for wetland losses.

(f) Compensatory mitigation projects provided to offset losses of aquatic resources must comply with the applicable provisions of 33 CFR part 332.

   (1) The prospective permittee is responsible for proposing an appropriate compensatory mitigation option if compensatory mitigation is necessary to ensure that the activity results in no more than minimal adverse environmental effects. For the NWPs, the preferred mechanism for providing compensatory mitigation is mitigation bank credits or in-lieu fee program credits (see 33 CFR 332.3(b)(2) and (3)). However, if an appropriate number and type of mitigation bank or in-lieu credits are not available at the time the PCN is submitted to the district engineer, the district engineer may approve the use of permittee-responsible mitigation.

   (2) The amount of compensatory mitigation required by the district engineer must be sufficient to ensure that the authorized activity results in no more than minimal individual and cumulative adverse environmental effects (see 33 CFR 330.1(e)(3)). (See also 33 CFR 332.3(f)).
(3) Since the likelihood of success is greater and the impacts to potentially valuable uplands are reduced, aquatic resource restoration should be the first compensatory mitigation option considered for permittee-responsible mitigation.

(4) If permittee-responsible mitigation is the proposed option, the prospective permittee is responsible for submitting a mitigation plan. A conceptual or detailed mitigation plan may be submitted by the district engineer to make the decision on the NWP verification request, but a final mitigation plan that addresses the applicable requirements of 33 CFR 332.4(c)(2) through (14) must be approved by the district engineer before the permittee begins work in waters of the United States, unless the district engineer determines that prior approval of the final mitigation plan is not practicable or not necessary to ensure timely completion of the required compensatory mitigation (see 33 CFR 332.3(k)(3)).

(5) If mitigation bank or in-lieu fee program credits are the proposed option, the mitigation plan only needs to address the baseline conditions at the impact site and the number of credits to be provided.

(6) Compensatory mitigation requirements (e.g., resource type and amount to be provided as compensatory mitigation, site protection, ecological performance standards, monitoring requirements) may be addressed through conditions added to the NWP authorization, instead of components of a compensatory mitigation plan (see 33 CFR 332.4(c)(1)(ii)).

(g) Compensatory mitigation will not be used to increase the acreage losses allowed by the acreage limits of the NWPs. For example, if an NWP has an acreage limit of 1/2-acre, it cannot be used to authorize any NWP activity resulting in the loss of greater than 1/2-acre of waters of the United States, even if compensatory mitigation is provided that replaces or restores some of the lost waters. However, compensatory mitigation can and should be used, as necessary, to ensure that an NWP activity already meeting the established acreage limits also satisfies the no more than minimal impact requirement for the NWPs.

(h) Permittees may propose the use of mitigation banks, in-lieu fee programs, or permittee-responsible mitigation. When developing a compensatory mitigation proposal, the permittee must consider appropriate and practicable options consistent with the framework at 33 CFR 332.3(b). For activities resulting in the loss of marine or estuarine resources, permittee-responsible mitigation may be environmentally preferable if there are no mitigation banks or in-lieu fee programs in the area that have marine or estuarine credits available for sale or transfer to the permittee. For permittee-responsible mitigation, the special conditions of the NWP verification must clearly indicate the party or parties responsible for the implementation and performance of the compensatory mitigation project, and, if required, its long-term management.

(i) Where certain functions and services of waters of the United States are permanently adversely affected by a regulated activity, such as discharges of dredged or fill material into waters of the United States that will convert a forested or scrub-shrub wetland to a herbaceous wetland in a permanently maintained utility line right-of-way, mitigation may be required to reduce the adverse environmental effects of the activity to the no more than minimal level.

24. Safety of Impoundment Structures. To ensure that all impoundment structures are safely designed, the district engineer may require non-Federal applicants to demonstrate that the structures comply with established state dam safety criteria or have been designed by qualified persons. The district engineer may also require documentation that the design has been independently reviewed by similarly qualified persons, and appropriate modifications made to ensure safety.

25. Water Quality. Where States and authorized Tribes, or EPA where applicable, have not previously certified compliance of an NWP with CWA section 401, individual 401 Water Quality Certification must be obtained or waived (see 33 CFR 330.4(c)). The district engineer or State or Tribe may require additional water quality management measures to ensure that the authorized activity does not result in more than minimal degradation of water quality.

26. Coastal Zone Management. In coastal states where an NWP has not previously received a state coastal zone management consistency concurrence, an individual state coastal zone management consistency concurrence must be obtained, or a presumption of concurrence must occur (see 33 CFR 330.4(d)). The district engineer or a State may require additional measures to ensure that the authorized activity is consistent with state coastal zone management requirements.

27. Regional and Case-By-Case Conditions. The activity must comply with any regional conditions that may have been added by the Division Engineer (see 33 CFR 330.4(e)) and with any case-specific conditions added by the Corps or by the state, an Indian Tribe, or U.S. EPA in its section 401 Water Quality Certification, or by the state in its Coastal Zone Management Act consistency determination.

28. Use of Multiple Nationwide Permits. The use of more than one NWP for a single and complete project is prohibited, except when the acreage loss of waters of the United States authorized by the NWPs does not exceed the acreage limit of the NWP with the highest specified acreage limit. For example, if a road crossing over tidal waters is constructed under NWP 14, with associated bank stabilization authorized by NWP 13, the maximum acreage loss of waters of the United States for the total project cannot exceed 1/3-acre.

29. Transfer of Nationwide Permit Verifications. If the permittee sells the property associated with a nationwide permit verification, the permittee may transfer the nationwide permit verification to the new owner by submitting a letter to the appropriate Corps district office to validate the transfer. A copy of the nationwide permit verification must be attached to the letter, and the letter must contain the following statement and signature:

“When the structures or work authorized by this nationwide permit are still in existence at the time the property is transferred, the terms and conditions of this nationwide permit, including any special conditions, will continue to be binding on the new owner(s) of the property. To validate the transfer of this nationwide permit and the associated liabilities associated with compliance with its terms and conditions, have the transferee sign and date below.”

_____________________________________________  ________________________________________
(Transferee)                                                                   (Date)
45 calendar days have passed from the district engineer's receipt of the complete PCN and the prospective permittee has not received written notice from the Corps or division engineer. However, if the permittee was required to notify the Corps pursuant to general condition 20 that the activity might have the potential to cause effects to the historic properties, the permittee may begin the activity until the district engineer issues the waiver. If the district engineer issues the waiver, the permittee may begin the activity until an individual permit is issued. The Corps will provide the permittee the certification document with the potential to cause effects to historic properties. The certification document will include:

(a) A statement that the authorized activity was done in accordance with the NWP authorization, including any general, regional, or activity-specific conditions;

(b) A statement that the implementation of any required compensatory mitigation was completed in accordance with the permit conditions. If credits from a mitigation bank or in-lieu fee program are used to satisfy the compensatory mitigation required compensatory mitigation, whichever occurs later.

(c) The signature of the permittee certifying the completion of the activity and

31. Activities Affecting Structures or Works Built by the United States. If an NWP activity also requires permission from the Corps pursuant to 33 U.S.C. 408 because it will alter, temporarily or permanently, a U.S. Army Corps of Engineers (USACE) federally authorized Civil Works project (a “USACE project”), the prospective permittee must submit a pre-construction notification. The PCN must be in writing and include the following information:

(1) Name, address and telephone numbers of the prospective permittee;

(2) Location of the proposed activity; (3) Identify the specific NWP or NWP(s) the prospective permittee wants to proceed under the NWP with any special conditions imposed by the district or division engineer; or

(3) Identify the specific NWP or NWP(s), the prospective permittee wants to proceed under the NWP with any special conditions imposed by the district or division engineer.

32. Pre-Construction Notification. Where required by the terms of the NWP, the prospective permittee must notify the Corps of a construction activity and submit a pre-construction notification (PCN) as early as possible. The district engineer will then review the PCN to determine if the activity is complete. If the PCN is determined to be complete, the district engineer will notify the permittee that the PCN is complete. If the PCN is determined to be incomplete, the district engineer will notify the permittee that the PCN is incomplete and the PCN process will not commence until all of the requested information has been received by the district engineer. The prospective permittee may begin the activity until the PCN is complete, as determined by the district engineer.
activity (e.g., a conceptual plan), but do not need to be detailed engineering plans; (f) The PCN must include a delineation of wetlands, other special aquatic sites, and other special areas, such as lakes and ponds, and perennial, intermittent, or ephemeral streams, on the project site. Wetland delineations must be prepared in accordance with the current method required by the Corps. The delineations may be made by the Corps or by an independent consultant. (g) The project site is large if it contains more than 40 acres of wetlands or other special aquatic sites, and other special areas, such as lakes and ponds, and perennial, intermittent, or ephemeral streams, on the project site. (h) Other special areas, such as lakes and ponds, and perennial, intermittent, or ephemeral streams, on the project site. (i) The PCN must indicate whether the proposed activity will result in the loss of greater than 1,000 square feet of wetlands or other special aquatic sites, or greater than 30 feet from the mean low water line in tidal waters. (j) The proposed activity may be located in designated critical habitat, the PCN must include the name(s) of those endangered or threatened species that might be affected by the proposed activity. For NWP activities that require pre-construction notification, Federal permits will provide documentation demonstrating compliance with section 10 of the Endangered Species Act. (k) The pre-construction notification must include a statement describing how the mitigation requirement will be satisfied, or explaining why the adverse environmental effects are no more than minimal. If so contacted by an agency, the district engineer will wait an additional 15 calendar days before making a decision on the pre-construction notification. The district engineer will indicate in the administrative record associated with each pre-construction notification that the resource agencies’ concerns were considered. For NWP 37, the emergency watershed protection and rehabilitation activity may proceed immediately in cases where there is an emergency (see general condition 16) and (l) For an activity that requires permission from the Corps pursuant to 33 U.S.C. 408 because it will alter or permanently or temporarily occupy or use a state or federal waterway, the pre-construction notification must include a statement confirming that the project proponent has submitted a written request for section 408 permission from the appropriate Corps office having jurisdiction over that USACE project. (m) For an activity that requires permission from the Corps pursuant to 33 U.S.C. 408 because it will alter or permanently or temporarily occupy or use a state or federal waterway, the pre-construction notification must include a statement confirming that the project proponent has submitted a written request for section 408 permission from the appropriate Corps office having jurisdiction over that USACE project. (n) For an activity that requires permission from the Corps pursuant to 33 U.S.C. 408 because it will alter or permanently or temporarily occupy or use a state or federal waterway, the pre-construction notification must include a statement confirming that the project proponent has submitted a written request for section 408 permission from the appropriate Corps office having jurisdiction over that USACE project. (o) The district engineer will consider any comments from Federal and state agencies concerning the proposed activity’s compliance with the terms and conditions of the NWPs and the need for mitigation to reduce the activity’s adverse environmental effects so that they are no more than minimal. If so contacted by an agency, the district engineer will wait an additional 15 calendar days before making a decision on the pre-construction notification. The district engineer will indicate in the administrative record associated with each pre-construction notification that the resource agencies’ concerns were considered. For NWP 37, the emergency watershed protection and rehabilitation activity may proceed immediately in cases where there is an emergency (see general condition 16) and (p) For an activity that requires permission from the Corps pursuant to 33 U.S.C. 408 because it will alter or permanently or temporarily occupy or use a state or federal waterway, the pre-construction notification must include a statement confirming that the project proponent has submitted a written request for section 408 permission from the appropriate Corps office having jurisdiction over that USACE project. (q) For an activity that requires permission from the Corps pursuant to 33 U.S.C. 408 because it will alter or permanently or temporarily occupy or use a state or federal waterway, the pre-construction notification must include a statement confirming that the project proponent has submitted a written request for section 408 permission from the appropriate Corps office having jurisdiction over that USACE project. (r) For an activity that requires permission from the Corps pursuant to 33 U.S.C. 408 because it will alter or permanently or temporarily occupy or use a state or federal waterway, the pre-construction notification must include a statement confirming that the project proponent has submitted a written request for section 408 permission from the appropriate Corps office having jurisdiction over that USACE project. (s) Form of Pre-Construction Notice: "The standard individual permit application form (Form ENG 4345) may be used, but the completed application form must include all of the general information required in paragraphs (b)(1) through (10) of this general information. A letter containing the required information may also be used. (t) Application may provide electronic files of PCNs and supporting materials if the district engineer has established tools and procedures for electronic submissions.
Applicants are encouraged to provide the Corps with either electronic files or multiple copies of pre-construction notifications to expedite agency coordination.

**DISTRICT ENGINEER’S DECISION:**

1. In reviewing the PCN for the proposed activity, the district engineer will determine whether the activity authorized by the NWP will result in more than minimal individual or cumulative adverse environmental effects or may be contrary to the public interest. If a project proponent requests authorization by a specific NWP, the district engineer should issue the NWP verification for that activity if it meets the terms and conditions of that NWP, unless he or she determines, after considering mitigation, that the proposed activity will result in more than minimal individual and cumulative adverse effects on the aquatic environment and other aspects of the public interest and exercises discretionary authority to require an individual permit for the proposed activity. For a linear project, this determination will include an evaluation of the individual crossings of waters of the United States to determine whether they individually satisfy the terms and conditions of the NWP(s), as well as the cumulative effects caused by all of the crossings authorized by NWP. If an applicant requests a waiver of the 300 linear foot limit on impacts to streams or of an otherwise applicable limit, as provided for in NWPs 13, 21, 29, 36, 39, 40, 42, 43, 44, 45, 50, 51, 52, or 54, the district engineer will only grant the waiver upon a written determination that the NWP activity will result in only minimal individual and cumulative adverse environmental effects. For those NWPs that have a waivable 300 linear foot limit for losses of intermittent and ephemeral stream bed and a 1/2-acre limit (i.e., NWPs 21, 29, 39, 40, 42, 43, 44, 50, 51, 52, or 54), the loss of intermittent and ephemeral stream bed, plus any other losses of jurisdictional waters and wetlands, cannot exceed 1/2-acre.

2. When making minimal adverse environmental effects determinations the district engineer will consider the direct and indirect effects caused by the NWP activity. He or she will also consider the cumulative adverse environmental effects caused by activities authorized by NWP and whether those cumulative adverse environmental effects are no more than minimal. The district engineer will also consider site-specific factors, such as the environmental setting in the vicinity of the NWP activity, the type of resource that will be affected by the NWP activity, the functions provided by the aquatic resources that will be affected by the NWP activity, the degree or magnitude to which the aquatic resources perform those functions, the extent that aquatic resource functions will be lost as a result of the NWP activity (e.g., partial or complete loss), the duration of the adverse effects (temporary or permanent), the importance of the aquatic resource functions to the region (e.g., watershed or ecoregion), and mitigation required by the district engineer. If an appropriate functional or condition assessment method is available and practicable to use, that assessment method may be used by the district engineer to assist in the minimal adverse environmental effects determination. The district engineer may add case-specific special conditions to the NWP authorization to address site-specific environmental concerns.

3. If the proposed activity requires a PCN and will result in a loss of greater than 1/10-acre of wetlands, the prospective permittee should submit a mitigation proposal with the PCN. Applicants may also propose compensatory mitigation for NWP activities with smaller impacts, or for impacts to other types of waters (e.g., streams). The district engineer will consider any proposed compensatory mitigation or other mitigation measures the applicant has included in the proposal in determining whether the net adverse environmental effects of the proposed activity are no more than minimal. The compensatory mitigation proposal may be either conceptual or detailed. If the district engineer determines that the activity complies with the terms and conditions of the NWP and that the adverse environmental effects are no more than minimal, after considering mitigation, the district engineer will notify the permittee and include any activity-specific conditions in the NWP verification. Conditions for compensatory mitigation requirements must comply with the appropriate provisions at 33 CFR 332.3(k). The district engineer must approve the final mitigation plan before the permittee commences work in waters of the United States, unless the district engineer determines that prior approval of the final mitigation plan is not practicable or not necessary to ensure timely completion of the required compensatory mitigation. If the prospective permittee elects to submit a compensatory mitigation plan with the PCN, the district engineer will expeditiously review the proposed compensatory mitigation plan. The district engineer must review the proposed compensatory mitigation plan within 45 calendar days of receiving a complete PCN and determine whether the proposed mitigation would ensure the NWP activity results in no more than minimal adverse environmental effects. If the net adverse environmental effects of the NWP activity (after consideration of the mitigation proposal) are determined by the district engineer to be no more than minimal, the district engineer will provide a timely written response to the applicant. The response will state that the NWP activity can proceed under the terms and conditions of the NWP, including any activity-specific conditions added to the NWP authorization by the district engineer.

4. If the district engineer determines that the adverse environmental effects of the proposed activity are more than minimal, then the district engineer will notify the applicant either: (a) that the activity does not qualify for authorization under the NWP and instruct the applicant on the procedures to seek authorization under an individual permit; (b) that the activity is authorized under the NWP subject to the applicant’s submission of a mitigation plan that would reduce the adverse environmental effects so that they are no more than minimal; or (c) that the activity is authorized under the NWP with specific modifications or conditions. Where the district engineer determines that mitigation is required to ensure no more than minimal adverse environmental effects, the activity will be authorized within the 45-day PCN period (unless additional time is required to comply with general conditions 18, 20, and/or 31, or to evaluate PCNs for activities authorized by NWPs 21, 49, and 50), with activity-specific conditions that state the mitigation requirements. The authorization will include the necessary conceptual or detailed mitigation plan or a requirement that the applicant submit a mitigation plan that would reduce the adverse environmental effects so that they are no more than minimal. When compensatory mitigation is required, no work in waters of the United States may occur until the district engineer has approved a specific mitigation plan or has determined that prior approval of a final mitigation plan is not practicable or not necessary to ensure timely completion of the required compensatory mitigation.

**Further Information:**

1. District Engineers have authority to determine if an activity complies with the terms and conditions of an NWP.
2. NWPs do not obviate the need to obtain other federal, state, or local permits, approvals, or authorizations required by law.
3. NWPs do not grant any property rights or exclusive privileges.
4. NWPs do not authorize any injury to the property or rights of others.
5. NWPs do not authorize interference with any existing or proposed Federal project (see general condition 31).

SECTION 401 WATER QUALITY CERTIFICATION (4/7/17):

The State Water Control Board issued conditional §401 Water Quality Certification for NWP 12 as meeting the requirements of the Virginia Water Protection Permit Regulation, which serves as the Commonwealth’s §401 Water Quality Certification, provided that: (1) the activities are not associated with a surface water withdrawal or the transport of non-potable raw surface water, except for the purpose of hydrostatic testing and when the associated discharges are authorized by a VPDES permit, if required; (2) any compensatory mitigation meets the requirements in the Code of Virginia, Section 62. 1-44.15:23 A through C, except in the absence of same river watershed alternatives in Hydrologic Unit Codes (HUC) 02040303 and 02040304, single family dwellings or locality projects may use compensatory mitigation in HUC 02080102, 02080108, 02080110, or 02080111 in Virginia; (3) temporary diversions of surface water associated with “pump arounds” during the construction of utility crossings are specifically allowed.

COASTAL ZONE MANAGEMENT ACT CONSISTENCY DETERMINATION (4/5/17):

Based on the comments submitted by the agencies administering the enforceable policies of the Virginia CZM Program, DEQ concurs that the 2017 NWPs and Virginia Regional Conditions as proposed, are consistent with the Virginia CZM Program provided the following conditions, discussed below, are satisfied:

1) Prior to construction, applicants shall obtain all required permits and approvals for activities to be performed that are applicable to the Virginia CZM Program’s enforceable policies, and that applicants adhere to all the conditions contained therein.

The Virginia Marine Resources Commission’s (VMRC) concurrence of consistency with regard to the fisheries management, subaqueous lands management, wetlands management, and dunes management enforceable policies is based on the recognition that prospective permittees may be required to obtain additional state and/or local approvals from the VMRC and/or the local wetlands board prior to commencement of work in both tidal and nontidal waters under the agency’s jurisdiction. Such approvals must precede implementation of the projects.

2) The DEQ Office of Wetlands and Stream Protection (OWSP) has provided §401 Clean Water Act (CWA) Water Quality Certification for the 2017 NWPs and Regional Conditions, applicable to the wetlands management and point source pollution control enforceable policies of the Virginia CZM Program. The activities that qualify for the NWPs must meet the requirements of DEQ’s Virginia Water Protection Permit Regulation (9 VAC 25-210-130) and the permittee must abide by the conditions of the NWP. DEQ-OWSP has identified specific NWP exceptions. DEQ will process an individual application for a permit or a certificate or otherwise take action pursuant to 9 VAC 25-210-80 et seq, for those activities covered by an NWPs that have not received blanket §401 CWA Water Quality Certification.

The Corps should forward pre-construction notifications to DEQ for applicants that do not comply with or cannot meet the conditions of the §401 CWA Water Quality Certification. Further, the Commonwealth reserves its right to require an individual application for a permit or a certificate or otherwise take action on any specific project that could otherwise be covered under any of the NWPs when it determines on a case-by-case basis that concerns for water quality and the aquatic environment so indicate.

In accordance with the Federal Consistency Regulations at 15 CFR Part 930, section 930.4, this conditional concurrence is based on the applicants demonstrating to the Corps that they have obtained, or will obtain, all necessary authorizations prior to implementing a project which qualifies for a NWP. If the requirements of section 930.4, sub-paragraphs (a)(1) through (a)(3) are not met, this conditional concurrence becomes an objection under 15 CFR Part 930, section 940.43.
March 16, 2011

PROGRAMMATIC AGREEMENT
AMONG SPOTSYLVANIA COUNTY, THE VIRGINIA STATE HISTORIC
PRESERVATION OFFICE, AND THE NORFOLK DISTRICT, CORPS OF
ENGINEERS RELATIVE TO THE DEVELOPMENT OF CERTAIN UTILITY
PROJECTS IN SPOTSYLVANIA COUNTY, VIRGINIA

WHEREAS, The Spotsylvania County 2002 Water and Sewer Master Plan Revisions is
intended to facilitate implementation of the County Comprehensive Plan by identifying
water and sewer system upgrades and defining specific capital water and sewer projects
that must be implemented to facilitate the intended growth; and,

WHEREAS, in order to implement this plan, modernize its infrastructure, reduce
operations and maintenance costs, and better serve existing homeowners and businesses,
the County plans to design and construct future sanitary sewer, waterlines and other
utilities along the Old Virginia Central Railroad bed (between the City of Fredericksburg
and Fawn Lake Subdivision in Spotsylvania) in phases over approximately fifteen years,
depending on funding and other factors, and as depicted on the “Virginia Central
Railroad Water and Sewer Improvements Plan” dated January 2011 and included here as
Attachment A; and

WHEREAS, As a part of the utility improvements shown on the aforementioned Virginia
Central Railroad Water and Sewer Improvements Plan, the Spotsylvania County Utilities
Department [the County] proposes to construct a project designated as “Hazel Run
Interceptor Project – Phase II” (Attachment B), located along Hazel Run, a perennial
tributary of the Rappahannock River, in the City of Fredericksburg and the County of
Spotsylvania Virginia, and consisting of approximately 13,661 linear feet of a 15-inch
underground sanitary sewer and located along the Old Virginia Central Railroad bed which
will improve public sewer services for existing customers in the Salem Run, Twin Springs,
Maple Grove, and Waverly Village Subdivisions with the elimination of three pump
stations; and

WHEREAS, pursuant to 36 CFR Part 800, regulations implementing Section 106 of the
National Historic Preservation Act of 1966 (NHPA), as amended, 16 U.S.C. 470f, and 33
CFR Part 325, Appendix C, Processing of Department of the Army Permits: Procedures for
Protection of Historic Places, the US Army Corps of Engineers (Corps) is required to take
into account the effects of federally permitted undertakings on properties included in or
eligible for inclusion in the National Register of Historic Places (NRHP) prior to the
issuance of permits for the undertaking and to consult with the Virginia State Historic
Preservation Office (SHPO); and
WHEREAS, pursuant to Section 404 of the Clean Water Act, a permit from the Norfolk District Corps of Engineers (Corps) will be required for permanent and temporary impacts to 0.081 acre of forested wetland and 105 linear feet of stream to construct the Hazel Run Interceptor Phase II project and additional permits will likely be required to implement the County’s proposed Virginia Central Railroad Water and Sewer Improvements Plan; and

WHEREAS, the Corps, in consultation with the SHPO, has determined that there will be Areas of Potential Effects (APE) (Corps Permit Area) for the County’s overall Virginia Central Railroad Water and Sewer Improvements Plan which will be in areas of wetlands and streams associated with the various planned utility projects and portions of the upland adjacent to it, including the abandoned Virginia Central Railroad (DHR ID#088-5364), as shown on the attached map (Attachment A), and

WHEREAS, the 38-mile linear corridor of the Old Virginia Central Railbed (DHR ID#088-5364) has been identified as the Virginia Central Railway Historic District (DHR ID#088-5364) in the report titled, *A Phase I Cultural Resources Survey of the +3.5 Mile Virginia Central Railroad Trail Project, City of Fredericksburg, Virginia*, prepared by History Matters, LLC, and Thunderbird Archeology in December 2010, and includes associated structures and landscape features that contribute to the historic and architectural significance of the district. Those portions of the Virginia Central Railway Historic District that retain integrity of design, materials, location, and setting, are considered eligible for listing in the National Register of Historic Places under Criterion A, and potentially under criterion D, for its associations with transportation, industry, and commerce in the City of Fredericksburg, and in Spotsylvania and Orange Counties as well as for its tactical role in several major Civil War Battles; and

WHEREAS, the Hazel Run Interceptor Project – Phase II is located within the Salem Church Battlefield (DHR ID#088-5180) and the Battle of Fredericksburg (DHR ID#111-5296), properties considered eligible for the NRHP under Criterion A, and future projects likely will be located in the Chancellorsville Battlefield (DHR ID#088-5180), Wilderness Battlefield (DHR ID#088-5183) and the portions of the Fredericksburg and Spotsylvania National Military Park, as depicted on attachments A & B; and

WHEREAS, the Corps has determined that the Hazel Run Interceptor Project – Phase II will have an adverse effect on the Virginia Central Railway Historic District (DHR ID#088-5364) and the effects of future utility projects along the Old Virginia Central Railroad requiring Corps permits will likely be similar and repetitive, and the Corps has therefore consulted with the SHPO pursuant to 36 CFR Part 800.14(b) of the regulations (36 CFR Part 800) implementing Section 106 of the National Historic Preservation Act (NHPA; 16 U.S.C. 470); and

WHEREAS, the Corps has invited the participation of the Advisory Council on Historic Preservation (ACHP) in consultation to develop this Programmatic Agreement (Agreement), and the ACHP has declined to participate; and
WHEREAS, the Corps has invited the County to participate in this consultation and to sign this Agreement as an invited signatory and the County has elected to participate; and

WHEREAS, the Corps has invited the City of Fredericksburg to participate in this consultation and to sign this Agreement as a concurring party, and the City has elected to participate; and

WHEREAS, the Corps has invited the National Park Service to participate in this consultation and to sign this Agreement as a concurring party, and the National Park Service has elected to participate; and,

WHEREAS, the Corps has invited the Spotsylvania Greenways Initiative Organization to participate in this consultation and to sign this Agreement as a concurring party, and the Spotsylvania Greenways Initiative Organization elected to participate.

NOW THEREFORE, in order to satisfy the Corps’ Section 106 responsibilities to take into account the effects of undertakings requiring Corps permits on historic properties, the Corps and the SHPO agree that the Corps may issue a permit to the County for the Hazel Run Interceptor Project – Phase II and such permit and any future permits pursuant to this Agreement, and located within the Virginia Central Railroad corridor, will require compliance with this Agreement as a permit condition; thereby effectively incorporating all terms, provisions and stipulations of this Agreement as conditions to permits such that if any provision or stipulation herein is not fulfilled, such failure will constitute noncompliance with the permits, and the Corps may pursue enforcement and may seek all available remedies.

STIPULATIONS

I. PLANNING AND COMPLIANCE PREPARATION

A. For each utility project proposed for construction along the Old Virginia Central Railbed (DHR ID#088-5364) the County shall provide the Corps with a detailed Pre-Construction Notification, or other form of notice or permit application in effect at the time of submission, including the project location, wetlands delineation, and description of any period-associated culverts or other landscape features or historic structures. The County shall also describe the proposed treatment of any affected cultural resources, as appropriate.

B. Based upon the documentation provided, the Corps will determine the project’s area of potential effects (APE)/Corps permit area and notify the County of its decision on the APE. The Corps will also inform the County of its decision on any proposed treatment of affected cultural resources.

C. Following approval by the Corps and prior to any ground disturbance within the APE, the County shall implement the standard treatment measures as outlined in Stipulation II below without further consultation with the SHPO. Should
additional treatment measures be deemed appropriate by the Corps, the Corps will direct the County to initiate consultation with SHPO and other consulting parties, and the County shall implement any treatment required by the Corps.

II. TREATMENT OF THE VIRGINIA CENTRAL RAILWAY HISTORIC DISTRICT (DHR ID#088-5364).

The Corps, the SHPO and the other consulting parties agree that interpretation of the Old Virginia Central Railbed to the public is the appropriate treatment for this resource. The following are standard treatment measures:

A. Interpretive Signage.

1. The County shall develop interpretive signage in areas along the Virginia Central Railway Historic District adjacent to the railbed accessible to the public. Such signage may address the historic significance of the railbed, its associated features, the adjacent battlefield or other areas of historic interest in the immediate vicinity. For each permit pursuant to this Agreement and affecting the district and its associated resources the County will prepare a minimum of two signs.

2. The County Utilities Department agrees to coordinate the areas selected for signage with the Spotsylvania County Department of Parks and Recreation and the Spotsylvania Greenways Initiative Organization.

3. Within six (6) months of the date of issuance of the permit, and prior to the commencement of any permitted activities, the County shall submit a draft of the signage text, images and other materials to the Corps and the SHPO for review and approval and to the other consulting parties for review and comment. Following approval of the signage text, images and other materials by the Corps, the county may proceed with implementation of permitted activities affecting the historic property. Within ninety (90) days of receiving final approval of the signage in writing from the Corps, the County shall pay for the fabrication and installation of the interpretive signs.

4. The County shall notify the Corps and the SHPO of the installation within forty-five (45) days of installation.

B. Trail Preparation.

Following excavation of the railbed for installation of utilities, the County agrees to restore the rail bed to a uniform grade, except where prohibited by the Corps’ permit, in preparation for future trails that may be designed and constructed within the Virginia Central Railway Historic District.

C. Protection of Culverts and other Associated Resources
1. Restrictive covenants have been recorded for archaeological sites 44SP142 and 44SP159, culverts associated with the Old Virginia Central Railroad and located within the proposed Hazel Run Interceptor Project – Phase II. If the County determines during their project design that impacts to these archaeological sites are unavoidable, then within six (6) months of the date of issuance of the permit, the County shall submit a draft of a plan for the treatment of these resources to the Corps and the SHPO for review and approval and to the other consulting parties for review and comment. Following approval of the treatment plan by the Corps, the County may proceed with implementation of permitted activities affecting the historic property.

2. For future utility projects pursuant to this Agreement, the County shall develop plans for avoidance of any culverts or other associated landscape features within the project’s APE. If the County determines during their project design that impacts to these archaeological sites are unavoidable, then within six (6) months of the date of issuance of the permit, the County shall submit a draft of a plan for the treatment of these resources to the Corps and the SHPO for review and approval and to the other consulting parties for review and comment. Following approval of the treatment plan by the Corps, the County may proceed with implementation of permitted activities affecting the historic property.

3. For future utility projects pursuant to this Agreement if the Corps finds that an historic structure or district is located within the APE for indirect effects, as a result of necessary tree removal or other actions the Corps shall submit the project to the SHPO and other consulting parties for comment. Should the Corps find in consultation with the SHPO and other consulting parties that the proposed actions will result in an adverse effect on the historic structure or district, the Corps will direct the County to prepare one of two treatment options:

   a. Documentation.
      1). Prior to the commencement of any permitted activities, the County shall prepare black and white 35 mm photographic documentation of the consistent with the guidance found in "Photographic Documentation for Virginia Department of Historic Resources (DHR) Basic Survey" (updated June 10, 2009) and complete a SHPO Intensive Level Survey Form for the historic property in the SHPO’s Data Sharing System (DSS). In addition, the 35mm negatives or the original color TIF digital files used to prepare the black and white photographic documentation shall be submitted to the SHPO, consistent with the guidance found in "Photographic Documentation for Virginia Department of Historic Resources (DHR) Basic Survey." The County shall submit the documentation to the Corps and the SHPO for review and approval, and to the other consulting parties for 30-day review and comment.

      2). The County shall ensure that the historic property will be documented in a written report illustrated with maps and line drawings, and standard size
(3.5 x 5) black and white photographs. The report shall address, at minimum, the physical description and historical context of the property. Photographs shall be taken of all elevations and character-defining elements. Intensive level Data Sharing System (DSS) forms will be prepared for the resource(s) and entered into the DSS -- OR -- the existing Intensive level forms for the resource(s) will be updated as appropriate and entered into the DSS. The County shall ensure that the documentation, including photographs, is completed according to the most recent SHPO archival guidelines, and that all materials are accepted by the SHPO prior to implementation of the undertaking following the requirements for preparation and review of draft and final reports in Stipulation V. The County shall ensure that copies of the documentation will be made available to other consulting parties. Following approval of the final documentation by the Corps, the County may proceed with implementation of permitted activities affecting the historic property.

III. REPORTING REQUIREMENTS

For each permit issued pursuant to this Agreement, upon the completion of all stipulations to this Agreement, the County shall provide to the Corps, with a copy to SHPO, a signed memorandum documenting that the County has fulfilled all its responsibilities under this Agreement.

IV. PROFESSIONAL QUALIFICATIONS

All archaeological and/or architectural work carried out pursuant to this Agreement shall be conducted by or under the direct supervision of an individual or individuals who meets, at a minimum, the Secretary of the Interior's Professional Qualifications Standards (48 FR 44738-9, September 29, 1983) in the appropriate discipline.

V. PREPARATION AND REVIEW OF DOCUMENTS

A. All architectural studies resulting from this agreement shall be consistent with pertinent standards and guidelines of the Secretary of the Interior, including as applicable the Secretary's Standards and Guidelines for Historical Documentation (48 FR 44728-30) and for Architectural and Engineering Documentation (48 FR 44730-34).

B. The SHPO and other consulting parties agree to provide comments on all signage, technical reports, treatment plans, and other documentation arising from this Agreement within thirty (30) calendar days of receipt. If no comments are received from the SHPO or other consulting parties within the thirty (30) day
VI. POST-REVIEW DISCOVERIES

a. The County shall ensure that the following provision is included in all construction contracts: "If previously unidentified historic properties or unanticipated effects to historic properties are discovered during construction, the construction contractor shall immediately halt all activity within a one hundred (100) foot radius of the discovery, notify the County of the discovery and implement interim measures to protect the discovery from looting and vandalism."

b. Immediately upon receipt of the notification required in the above Stipulation, the County shall
   1. Inspect the construction site to determine the extent of the discovery and ensure that construction activities have halted; and
   2. Clearly mark the area of the discovery; and
   3. Implement additional measures, as appropriate, to protect the discovery from looting and vandalism; and
   4. Have a professional archeologist inspect the construction site to determine the extent of the discovery and provide recommendations regarding its NRHP eligibility and treatment; and
   5. Notify the Corps, the SHPO and other consulting parties of the discovery describing the measures that have been implemented to comply with this Stipulation.

c. Upon receipt of the information required in the above Stipulation, the Corps shall provide the County, the SHPO and other consulting parties with its assessment of the NRHP eligibility of the discovery and the measures proposed to resolve adverse effects. In making its evaluation, the Corps, in consultation with the SHPO, may assume the discovery to be NRHP eligible for the purposes of Section 106 pursuant to 36 CFR Part 800.13(c). The County, the SHPO and other consulting parties shall respond to the Corps’ assessment within two (2) business days of receipt.

d. The Corps will take into account the SHPO and other consulting parties’ recommendations on eligibility and treatment of the discovery and will notify the County of any appropriate required actions. The County must comply with the required actions and provide the Corps and consulting parties with a report on the actions when implemented. Any actions that the Corps deems appropriate for the County to take with regard to such discovery will automatically become additional stipulations to this Agreement and thereby will be incorporated in the permit and become conditions to the permit. If the County fails to comply with such actions, such failure will constitute a breach of this Agreement and noncompliance with the permit.
c. Construction activities may proceed in the area of the discovery, when the Corps has determined that implementation of the actions undertaken to address the discovery pursuant to this Stipulation are complete.

VII. DISPUTE RESOLUTION

a. Should any party to this Agreement object in writing to the Corps regarding any action carried out or proposed with respect to any undertakings covered by this agreement or to implementation of this Agreement, the Corps will consult with the objecting party to resolve the objection.

b. If after initiating such consultation, the Corps determines that the objection cannot be resolved through consultation, the Corps shall forward all documentation relevant to the objection to the ACHP, including the proposed response to the objection.

c. Within thirty (30) days after receipt of all pertinent documentation, the ACHP shall exercise one of the following options:
   1. Advise the Corps that the ACHP concurs with the Corps’ proposed response to the objection, whereupon the Corps will respond to the objection accordingly; or
   2. Provide the Corps with recommendations, which the Corps shall take into account in reaching a final decision regarding its response to the objection; or
   3. Notify the Corps that the objection will be referred for comment pursuant to 36 CFR 800.7(a)(4), and proceed to refer the objection and comment. The Corps shall take the resulting comment into account in accordance with 36 CFR 800.7(c)(4) and Section 110(l) of the NHPA.

d. Should the ACHP not exercise one of the above options within thirty (30) days after receipt of all pertinent documentation, the Corps may assume the ACHP’s concurrence in its proposed response to the objection.

e. The Corps shall take into account any ACHP recommendation or comment provided in accordance with this stipulation with reference only to the subject of the objection; the Corps’ responsibility to carry out all the actions under this Agreement that are not the subjects of the objections shall remain unchanged.

f. At any time during implementation of the measures stipulated in this Agreement, should an objection pertaining to this Agreement be raised by a member of the public, the Corps shall notify the parties to this Agreement and take the objection into account, consulting with the objector and, should the objector so request, with any of the parties to this Agreement to resolve the objection.
X. AMENDMENTS AND TERMINATION

A. Any signatory party to this Agreement may propose to the Corps that the Agreement be amended, whereupon the Corps will consult with the other parties to this Agreement to consider such an amendment. All signatories to the Agreement must agree to the proposed amendment in accordance with 800.6(c)(7).

B. If the County decides it will not proceed with the undertaking, it shall so notify the Corps, the SHPO, and the other consulting parties and this Agreement shall become null and void.

C. If the County determines that it cannot implement the terms of this Agreement, or if the Corps or SHPO determines that the Agreement is not being properly implemented, the County, the Corps, or the SHPO may propose to the other parties to this Agreement that it be amended or terminated.

D. This Agreement may be terminated by any signatory to the Agreement in accordance with the procedures described in 800.6(c)(8). Termination shall include the submission of a technical report or other documentation by the County on any work done up to and including the date of termination. If the Corps is unable to execute another Agreement following termination, the Corps may choose to modify, suspend, or revoke the Department of the Army permit as provided by 33 CFR 325.7.

XI. DURATION OF AGREEMENT

A. This Agreement will continue in full force and effect until ten (10) years after the date of the last signatory part’s signature. The County shall fulfill the requirements of this Agreement prior to and in conjunction with the work authorized by the Department of the Army permits. All obligations under this Agreement must be complete before expiration of this Agreement. If any obligation is not complete, the party responsible for such obligation is in violation of this Agreement; such violation may also constitute a violation of the Department of the Army permits. Failure of the Corps to pursue such violation is NOT a waiver.

B. At any time in the six-month period prior to such date, the Corps may request the signatory parties to consider an extension or modification of this Agreement. No extension or modification will be effective unless all parties to the Agreement have agreed with it in writing. If the Signatories agree to an extension of this Agreement the Signatories will execute a written modification, based on the template at Attachment C, extending the Agreement for an additional five (5) years from the date the original Agreement would have expired absent the extension.

X. EXECUTION OF AGREEMENT
A. This Agreement may be executed in counterparts, with a separate page for each signatory. The Corps will ensure that each party is provided with a copy of the fully executed Agreement.

B. If the Signatories agree to an extension of this Agreement the Signatories will execute a written modification, based on the template at Appendix H, extending the Agreement for an agreed upon period from the date the original Agreement would have expired absent the extension.

Execution of this Memorandum of Agreement by the Corps and the SHPO and its submission to the ACHP in accordance with 36 CFR 800.6(b)(1)(iv), shall, pursuant to 36 CFR 800.14(b), be considered to be an agreement pursuant to the regulations issued by the ACHP for the purposes of Section 110(1) of the NHPA. Execution and submission of this Agreement, and implementation of its terms, evidence that the Corps has afforded the ACHP an opportunity to comment on the proposed undertakings and their effects on historic properties, and that the Corps has taken into account the effect of the undertakings on historic properties.

SIGNATORIES:

COUNTY OF SPOTSYLVANIA

By: ___________________________ Date: ________________
NAME

NORFOLK DISTRICT, U.S. ARMY CORPS OF ENGINEERS

By: ___________________________ Date: 3/16/11
Tom Walker
Chief, Regulatory Branch

VIRGINIA STATE HISTORIC PRESERVATION OFFICER

By: ___________________________ Date: 3/22/11
Kathleen S. Kilpatrick
Director, Virginia Department of Historic Resources
CONCUR:

CITY OF FREDERICKSBURG

By: _________________________________  Date: ________________
NAME

NATIONAL PARK SERVICE

By: _________________________________  Date: 3/23/11
Russell P. Smith
Superintendent
Fredericksburg & Spotsylvania National Military Park

Spotsylvania Greenways Initiative

By: _________________________________  Date: ________________
NAME
CONCUR:

CITY OF FREDERICKSBURG

By: ___________________________ Date: ________________
NAME

NATIONAL PARK SERVICE

By: ___________________________ Date: ________________
Russell P. Smith, Superintendent
Fredericksburg & Spotsylvania National Military Park

Spotsylvania Greenways Initiative

By: ___________________________ Date: 3/24/2011
NAME
CHRISTINA J. FOGER
CHAIR, SPOTSYLVANIA GREENWAYS INITIATIVE
CONCUR:

CITY OF FREDERICKSBURG

By: Beverly R. Cameron, City Manager

Date: 04.04.11

NATIONAL PARK SERVICE

By: Russell P. Smith, Superintendent

Date: 

Fredericksburg & Spotsylvania National Military Park

Spotsylvania Greenways Initiative

By: 

Date: 

NAME
ATTACHMENT C

MODIFICATION TO EXTEND AGREEMENT

By executing this one paragraph modification, the below signatories hereby extend this Agreement for five (5) years from the date that it would have otherwise expired absent this extension.

COUNTY OF SPOTSYLVANIA

By: [Signature]  Date: 4/21/11
NAME

NORFOLK DISTRICT, U. S. ARMY CORPS OF ENGINEERS

By: _______________________________  Date: __________________
Tom Walker
Chief, Regulatory Branch

VIRGINIA STATE HISTORIC PRESERVATION OFFICER

By: _______________________________  Date: __________________
Kathleen S. Kilpatrick
Director, Virginia Department of Historic Resources

APPROVED AS TO FORM:

[Signature]  COUNTY ATTORNEY
FIRST AMENDMENT
TO
PROGRAMMATIC AGREEMENT
AMONG SPOTSYLVANIA COUNTY, THE VIRGINIA STATE HISTORIC
PRESERVATION OFFICE, AND THE NORFOLK DISTRICT, CORPS OF
ENGINEERS RELATIVE TO THE DEVELOPMENT OF CERTAIN UTILITY
PROJECTS IN SPOTSYLVANIA COUNTY, VIRGINIA

November 2014

WHEREAS, on June 2, 2011 a Programmatic Agreement (Agreement) was executed among the Norfolk District Corps of Engineers (USACE), the Virginia State Historic Preservation Office (SHPO) and Spotsylvania County (County) for the construction of a project designated as “Hazel Run Interceptor Project – Phase II” (Attachment B), located along Hazel Run, a perennial tributary of the Rappahannock River, in the City of Fredericksburg and the County of Spotsylvania Virginia, and consisting of approximately 13,661 linear feet of a 15-inch underground sanitary sewer and located along the Old Virginia Central Railroad bed which will improve public sewer services for existing customers in the Salem Run, Twin Springs, Maple Grove, and Waverly Village Subdivisions with the elimination of three pump stations; and

WHEREAS, Stipulation XI.A Duration of Agreement calls for this Agreement to remain in effect until June of 2021 and Stipulation XI.B enables the Signatories to execute a written modification, based upon the template at Appendix H, extending the Agreement for an agreed upon period from the date the original Agreement would have expired absent the extension; and

WHEREAS, Stipulation X. A and C Amendments and Termination, enables this Agreement to be amended, provided all signatories agree to the amendment in accordance with 800.6(2) (7); and

WHEREAS, the Signatories are unanimous that this Agreement should be continued and that Stipulations II. A. 1 and 3 Interpretive Signage should be amended to support the County’s efforts to interpret the historic significance of the Old Virginia Central Railroad bed; and

NOW, THEREFORE, the USACE, the SHPO and the County (the Signatories) agree to the following language to substitute for the Stipulations cited above and that the undertaking shall be implemented in accordance with all stipulations of the original Agreement and this Amendment in order to comply with Section 106 of the National Historic Preservation Act and take into account the Undertakings ’s potential effects on historic properties.

1) Current language of Stipulation II. A.1:
The County shall develop interpretive signage in areas along the Virginia Central Railway Historic District adjacent to the railbed accessible to the public. Such signage may address the historic significance of the railbed, its associated features, the adjacent battlefield or other areas of historic interest in the immediate vicinity. For each permit pursuant to this Agreement and affecting the district and its associated resources the County will prepare a minimum of two signs.

Amended language of Stipulation II. A.1:

Within public utility easements that have a concurrent recorded public trail easement, the County shall develop interpretive signage in areas along the Virginia Central Railway Historic District adjacent to the railbed accessible to the public. Such signage may address the historic significance of the railbed, its associated features, the adjacent battlefield or other areas of historic interest in the immediate vicinity. For each permit pursuant to this Agreement and affecting the district and its associated resources the County will prepare a minimum of two signs.

2) Current language of Stipulation II. A.3:

Within six (6) months of the date of issuance of the permit, and prior to the commencement of any permitted activities, the County shall submit a draft of the signage text, images and other materials to the Corps and the SHPO for review and approval and to the other consulting parties for review and comment. Following approval of the signage text, images and other materials by the Corps, the county may proceed with implementation of permitted activities affecting the historic property. Within ninety (90) days of receiving final approval of the signage in writing from the Corps, the County shall pay for the fabrication and installation of the interpretive signs.

Amended language of Stipulation II. A.3:

Within six (6) months of the date of issuance of the permit, and prior to the commencement of any permitted activities, the County shall submit a draft of the signage text, images and other materials to the USACE and the SHPO for review and approval and to the other consulting parties for review and comment. Following approval of the signage text, images and other materials by the USACE, the county may proceed with implementation of permitted activities affecting the historic property. Within ninety (90) days of project completion, the County shall pay for the fabrication and installation of the interpretive signs.

3) TERMS AND CONDITIONS. Except as specifically modified by this Amendment, all terms and conditions of the 2011 Agreement remain unchanged.
4) **EXECUTION OF AGREEMENT**

This Agreement may be executed in counterparts, with a separate page for each signatory. The USACE will ensure that each party is provided with a copy of the fully executed Amendment.

Execution of the Programmatic Agreement and this Amendment to it by the USACE, the SHPO and the County and its submission to the ACHP in accordance with 36 CFR 800.6(b)(1)(iv), shall, pursuant to 36 CFR 800.6(c), be considered to be an agreement pursuant to the regulations issued by the Advisory Council on Historic Preservation (ACHP) for the purposes of Section 110(l) of the NHPA. Execution and submission of this Amendment, and implementation of the its terms and the terms of the original of Agreement, evidence that the USACE has afforded the ACHP an opportunity to comment on the proposed undertaking and its effect on historic properties, and that the USACE has taken into account the effect of the undertaking on historic properties.
SIGNATORIES:

COUNTY OF SPOTSylvANIA

By: [Signature]  NAME

Date: 11-5-19
NORFOLK DISTRICT, U. S. ARMY CORPS OF ENGINEERS

By: [Signature]  Date: 11/6/2014
Tom Walker
Chief, Regulatory Branch
VIRGINIA STATE HISTORIC PRESERVATION OFFICER

By: [Signature]  Date: 11-7-17

Julie V. Langan
Director, Virginia Department of Historic Resources
Virginia Department of Environmental Quality – General VDPES Permit for Discharges of Stormwater from Construction Activities (General Permit VAR10)
Section I. Operator/Permittee Information.

A. Construction Activity Operator (Permittee). The person or entity that is applying for permit coverage and will have operational control over construction activities to ensure compliance with the general permit. A person with signatory authority for this operator must sign the certification in Section VI. (per Part III. K. of the VAR10 Permit).

Construction Activity Operator Name: Spotsylvania County Department of Utilities
Contact person: Ben Loveday
Address: 600 Hudgins Road
City, State, Zip Code: Fredericksburg, VA, 22408
Phone Number: 540-507-7307
Primary Email: BLoveday@spotsylvania.va.us
CC Email:

B. Billing Information (leave blank if same as the Operator identified in Section I. A. above). This entity will receive Annual Permit Maintenance and Permit Modification Fee invoices (if applicable).

Name:
Contact Person:
Address:
City, State Zip Code:
Phone Number:
Primary Email:
CC Email:

C. May we transmit correspondence electronically? You must choose YES and include a valid email in order to pay by credit card and to receive your permit coverage approval letter via email:

YES ☒     NO ☐
Section II. Construction Activity Location Information. Project site information.

A. Include a site map showing the location of the existing or proposed land-disturbing activities, the limits of land disturbance, construction entrances and all water bodies receiving stormwater discharges from the site.

B. Construction Activity Name: Massaponax Interceptor Replacement - Phase 4A

Address: From Gordon Road, west approximately 3000 feet along Massaponax Creek, terminating just west of Enchanted Woods Way

City and/or County and Zip Code: Fredericksburg, VA, 22407 (Spotsylvania County)

Latitude and Longitude (6-digit, decimal degrees format):

| Latitude: 35.279392 | Longitude: -77.584258 |

C. Construction Activity Entrance Location (description, street address and/or latitude/longitude in decimal degrees):

Section III. Offsite Support Activity Location Information. List all offsite support activities to be included under this permit registration. Enter additional areas on a separate page. Offsite areas not included on this registration may need to obtain coverage under a separate VPDES permit.

A. Offsite Activity Name: N/A

Address:

City and/or County and Zip Code:

Latitude and Longitude (6-digit, decimal degrees format):

B. Offsite Activity Entrance Location (description, street address and/or latitude/longitude in decimal degrees):

Section IV. Site Information.

A. Acreage totals for all land-disturbing activities to be included under this permit coverage. Report to the nearest one-hundredth of an acre.

| Total land area of development (including the entire area to be disturbed as approved in the Stormwater Management Plan): | Varies over many properties |
| Primary estimated area to be disturbed (portions with Erosion and Sediment Control Plan approval only): | 6.6 acres |
| Offsite estimated area to be disturbed (if applicable): |

B. Estimated Project Dates (MM/DD/YYYY)

| Start date: | 07/2019 |
| Completion date: | 07/2020 |

C. Property Owner Status: FEDERAL ☐ STATE ☐ PUBLIC ☒ PRIVATE ☐

D. Nature of the Construction Activity Description (i.e. commercial, industrial, residential, agricultural, environmental):

Municipal - utility project

E. Municipal Separate Storm Sewer System (MS4) name (if discharging to a MS4):

N/A
CONSTRUCTION GENERAL PERMIT (VAR10) REGISTRATION STATEMENT 2019

F. Is this construction activity part of a common plan of development or sale? YES ☐ NO ☒

G. 6th Order Hydrologic Unit Code (HUC) and Receiving Water Name(s). Attach a separate list if needed.

<table>
<thead>
<tr>
<th>HUC</th>
<th>RECEIVING WATERBODY(S)</th>
</tr>
</thead>
<tbody>
<tr>
<td>020801040103</td>
<td>Rappahannock River</td>
</tr>
</tbody>
</table>

Section V. Other Information.

A. A stormwater pollution prevention plan (SWPPP) must be prepared in accordance with the requirements of the General VPDES Permit for Discharges of Stormwater from Construction Activities prior to submitting the Registration Statement. By signing the Registration Statement, the operator is certifying that the SWPPP has been prepared.

B. Has an Erosion and Sediment Control Plan been submitted to the VESCP Authority for review? YES ☐ NO ☒
   Erosion and Sediment Control Plan Approval Date (for estimated area to be disturbed): ______________________

C. Has land disturbance has commenced? YES ☐ NO ☒

D. If this project is using approved Annual Standards and Specifications (AS&S), attach the completed AS&S Entity Form. AS&S Entity Name (if different from the Operator identified in Section II. A.): ______________________

SEE THE FOLLOWING PAGE FOR SIGNATURE
AND CERTIFICATION REQUIREMENTS AND INFORMATION
Section VI. Certification. A person representing the operator as identified in Section I. A. and meeting the requirements of 9VAC25-880-70. Part III. K must physically sign this certification. A typed signature is not acceptable. Please note that operator is defined in 9VAC25-870-10 as follows:

"Operator" means the owner or operator of any facility or activity subject to the Act and this chapter. In the context of stormwater associated with a large or small construction activity, operator means any person associated with a construction project that meets either of the following two criteria: (i) the person has direct operational control over construction plans and specifications, including the ability to make modifications to those plans and specifications or (ii) the person has day-to-day operational control of those activities at a project that are necessary to ensure compliance with a stormwater pollution prevention plan for the site or other state permit or VSMP authority permit conditions (i.e., they are authorized to direct workers at a site to carry out activities required by the stormwater pollution prevention plan or comply with other permit conditions). In the context of stormwater discharges from Municipal Separate Storm Sewer Systems (MS4s), operator means the operator of the regulated MS4 system.

9VAC25-880-70. Part III. K. Signatory Requirements. Registration Statement. All Registration Statements shall be signed as follows:

a. For a corporation: by a responsible corporate officer. For the purpose of this chapter, a responsible corporate officer means: (i) a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy-making or decision-making functions for the corporation; or (ii) the manager of one or more manufacturing, production, or operating facilities, provided the manager is authorized to make management decisions that govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long-term compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for state permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures;
b. For a partnership or sole proprietorship: by a general partner or the proprietor, respectively; or
c. For a municipality, state, federal, or other public agency: by either a principal executive officer or ranking elected official. For purposes of this chapter, a principal executive officer of a public agency includes: (i) the chief executive officer of the agency or (ii) a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency.

Certification: "I certify under penalty of law that I have read and understand this Registration Statement and that this document and all attachments were prepared in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is to the best of my knowledge and belief true, accurate, and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment for knowing violations."

Printed Name:  
Benjamin Loveday

Signature (signed in ink):  
[Signature]

Date:  
6/25/2019

Section VII. Submittal Instructions. Submit this form to the Virginia Stormwater Management Program (VSMP) Authority. If the locality is the VSMP Authority, please send your Registration Statement submittal directly to the locality; do NOT send this form to DEQ. A list of local VSMP Authorities is available here: VSMP Authorities.

If DEQ is the VSMP Authority, please send to:

Department of Environmental Quality
Office of Stormwater Management Suite 1400
PO Box 1105
Richmond VA 23218
constructiongp@deq.virginia.gov

If the locality is the VSMP Authority, please send to:

The Local VSMP Authority (insert address below)
CONSTRUCTION GENERAL PERMIT (VAR10) REGISTRATION STATEMENT 2019 INSTRUCTIONS

PLEASE DO NOT PRINT OR SUBMIT

This Registration Statement is for coverage under the General VPDES Permit for Discharges of Stormwater from Construction Activities. The following permit actions are covered by this form: new issuance, re-issuance, modification with an increase in acreage and plan modifications that do not result in an increase in acreage.

Choose NEW ISSUANCE if this Registration Statement submittal is to obtain a new permit coverage, RE-ISSUANCE to renew an active, expiring permit coverage or MODIFICATION to modify an active permit coverage. When modifying permit coverage, indicate if the modification is increasing the amount of acreage previously covered (MODIFICATION WITH ACREAGE INCREASE) or changing the site design with no increase in acreage (MODIFICATION WITHOUT ACREAGE INCREASE).

Existing Permit Coverage Number. Provide the permit number for a modification or reissuance (i.e. VAR10####).

Section I. Operator/Permittee Information.

A. Construction Activity Operator (Permittee). The person or entity that is applying for permit coverage and will have operational control over construction activities to ensure compliance with the general permit. For companies, use the complete, active, legal entity name as registered with a state corporation commission. Entities that are considered operators commonly consist of the property owner, developer of a project (the party with control of project plans and specifications), or general contractor (the party with day-to-day operational control of the activities at the project site that are necessary to ensure compliance with the general permit). If an individual person is named as the operator, that person (or a representative of) must sign the certification in Section VI. An operator can be one of the following:


"Operator" means the owner or operator of any facility or activity subject to the Act and this chapter. In the context of stormwater associated with a large or small construction activity, operator means any person associated with a construction project that meets either of the following two criteria: (i) the person has direct operational control over construction plans and specifications, including the ability to make modifications to those plans and specifications or (ii) the person has day-to-day operational control of those activities at a project that are necessary to ensure compliance with a stormwater pollution prevention plan for the site or other state permit or VSMP authority permit conditions (i.e., they are authorized to direct workers at a site to carry out activities required by the stormwater pollution prevention plan or comply with other permit conditions). In the context of stormwater discharges from Municipal Separate Storm Sewer Systems (MS4s), operator means the operator of the regulated MS4 system.

"Owner" means the Commonwealth or any of its political subdivisions including, but not limited to, sanitation district commissions and authorities, and any public or private institution, corporation, association, firm or company organized or existing under the laws of this or any other state or country, or any officer or agency of the United States, or any person or group of persons acting individually or as a group that owns, operates, charters, rents, or otherwise exercises control over or is responsible for any actual or potential discharge of sewage, industrial wastes, or other wastes or pollutants to state waters, or any facility or operation that has the capability to alter the physical, chemical, or biological properties of state waters in contravention of § 62.1-44.5 of the Code of Virginia, the Act and this chapter.

"Person" means any individual, corporation, partnership, association, state, municipality, commission, or political subdivision of a state, governmental body, including a federal, state, or local entity as applicable, any interstate body or any other legal entity.

B. Billing information. If the person or entity responsible for billing/invoicing is different from the operator, please complete this section. If they are the same, leave this section blank.

C. May we transmit correspondence electronically? If you choose YES to this question and provide an email address in Section I. A., all correspondence, forms, invoices and notifications will be transmitted by email to the operator. This will also allow the operator to pay by credit card and receive permit coverage approval letters immediately upon approval.

Section II. Construction Activity Location Information. Location information related to the project site.

A. A site map indicating the location of the existing or proposed land-disturbing activities, the limits of land disturbance, construction entrances and all water bodies receiving stormwater discharges from the site must be included with the submittal of this form. Aerial imagery maps or topographic maps showing the required items are acceptable. Plan sheet sized site maps are not required. Please consult your Virginia Stormwater Management Program (VSMP) authority if you have additional questions regarding site map requirements.

B. Provide a descriptive project name (it is helpful to use the same naming convention as listed on the Stormwater plans), 911 street address (if available), city/county of the construction activity, 6-digit latitude and longitude in decimal degrees format for the centroid, main construction entrance or start and end points for linear projects (i.e. 37.1234N/-77.1234W).

C. Construction Activity Entrance Location. Provide an address or decimal degrees coordinates and a description of the main construction entrance where the permit coverage letter will be posted.
Section III. Offsite Support Activity Location Information.

This general permit also authorizes stormwater discharges from support activities (e.g., concrete or asphalt batch plants, equipment staging yards, material storage areas, excavated material disposal areas, borrow areas) located on-site or off-site provided that (i) the support activity is directly related to a construction activity that is required to have general permit coverage; (ii) the support activity is not a commercial operation, nor does it serve multiple unrelated construction activities by different operators; (iii) the support activity does not operate beyond the completion of the construction activity it supports; (iv) the support activity is identified in the Registration Statement at the time of general permit coverage; (v) appropriate control measures are identified in a SWPPP and implemented to address the discharges from the support activity areas; and (vi) all applicable state, federal, and local approvals are obtained for the support activity.

If requesting permit coverage for offsite activities, please complete this section. List additional offsite areas to be included under this permit coverage on a separate page. Offsite areas not included on this registration will need to obtain coverage under a separate VPDES permit.

A. Offsite activity location information. Provide a descriptive offsite project name, 911 street address (if available) and city/county of all off-site support activities. Provide the 6-digit latitude and longitude in decimal degrees (i.e. 37.1234N, -77.1234W). Please note that off-site activities not covered under this permit may require separate permit coverage.

B. Offsite activity entrance location. Provide an address or decimal degrees coordinates and a description of the main construction entrance.

Section IV. Site Information.

A. Acreage totals for all land disturbing activities, on- and off-site, to be included under this permit. Acreages are to be reported to the nearest one-hundredth acre (two decimal places; i.e. 1.15 acres). Provide the total acreage of the primary development site as approved on the Stormwater Management Plans and the primary on-site estimated acreage to be disturbed by the construction activity as approved under the Erosion and Sediment Control Plans. The off-site estimated area to be disturbed is the sum of the disturbed acreages for all off-site support activities to be covered under this general permit. Do not include the off-site acreage totals in the primary, on-site total and estimated disturbed acreage totals. Permit fees are calculated based on your disturbed acreage total for all on- and off-site areas being disturbed under this permit coverage (the sum of all on-site and off-site disturbed acreages).

B. Estimated Project Dates. Provide the estimated project start date and completion date in Month/Day/Year or MM/DD/YYYY format (i.e. 07/30/2019).

C. Property owner status. The status of the construction activity property owner. Any property not owned by a government entity or agency (i.e. federal, state or local governments) is PRIVATE.

D. Nature of the construction activity description. Choose the designation that best describes the post-construction use of this project (you may choose more than one). (i.e. Residential, Commercial, Industrial, Agricultural, Environmental, Educational, Oil and Gas, Utility, Transportation, Institutional, etc.). Describe the project (i.e. Commercial – one new office building and associated parking and utilities; Transportation – Roads, sidewalks and utilities; Agricultural – 3 Poultry Houses, etc.).

E. Municipal Separate Storm Sewer System (MS4) name(s) if discharging to a MS4. If stormwater is discharged through a MS4 (either partially or completely), provide the name of the MS4(s) that will be receiving water from this construction activity. The MS4 name is typically the town, city, county, institute or federal facility where the construction activity is located.

F. This construction activity is part of a common plan of development or sale. "Common plan of development or sale" means a contiguous area where separate and distinct construction activities may be taking place at different times on different schedules per 9VAC25-870-10. Definitions. I.e. a subdivision, commercial development, business park, etc.

G. 6th Order Hydrologic Unit Code (HUC) and associated Receiving Water Name(s). Provide all 6th order HUCs and receiving waters for the site and offsite areas that could potentially receive stormwater runoff discharging from this activity. The HUC can be either a 12-digit number (i.e. 0208010101) or 2-letter, 2-number code (i.e. JL52). Include additional HUCs or receiving waters on a separate page. You may utilize DEQ's web-based GIS application, VEGIS, to obtain this information.

- VEGIS application link: [DEQ's VEGIS Mapping Application](https://www.deq.virginia.gov/programs/water/permitting/gis-mapping-applications/)
- Instructions for utilizing DEQ's VEGIS application link: [CGP GIS HUC Instructions](https://www.deq.virginia.gov/programs/water/permitting/gis-mapping-applications/)

Rev 04/2019
Section V. Other Information.

A. A stormwater pollution prevention plan (SWPPP) must be prepared prior to submitting the Registration Statement per 9VAC25-880. See 9VAC25-880-70. Part II. of the General Permit for the SWPPP requirements.

B. If the Erosion and Sediment Control Plan for the estimated area to be disturbed listed in Section IV. A. has been submitted to the Virginia Erosion and Sediment Control Program (VESCP) Authority for review and plan approval, choose YES. If you are submitting this application to reissue an existing permit coverage, please provide the date that the VESC Authority approved the Erosion and Sediment Control Plan for the estimated area to be disturbed.

C. If land disturbance has commenced, choose YES. "Land disturbance" or "land-disturbing activity" means a man-made change to the land surface that may result in soil erosion or has the potential to change its runoff characteristics, including construction activity such as the clearing, grading, excavating, or filling of land per §62.1-44.15:24. Definitions.

D. If this project is using approved Annual Standards and Specifications (AS&S), attach the completed AS&S Entity Form.
If the AS&S Entity is different from the operator identified in Section I. A., list the AS&S Entity Name. The AS&S entity is the entity or agency that holds the approved annual standards & specification.
- AS&S Entity Form link: Annual Standards and Specifications Entity Information Form

Section VI. Certification.

A properly authorized individual associated with the operator identified in Section I. A. of the Registration Statement is responsible for certifying and signing the Registration Statement. A person must physically sign the certification, a typed signature is unacceptable. State statutes provide for severe penalties for submitting false information on the Registration Statement. State regulations require that the Registration Statement be signed as follows per 9VAC25-880-70 Part III. K. 1.:

a. For a corporation: by a responsible corporate officer. For the purpose of this part, a responsible corporate officer means:
(i) A president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy-making or decision-making functions for the corporation, or
(ii) the manager of one or more manufacturing, production, or operating facilities, provided the manager is authorized to make management decisions that govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long-term compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.

b. For a partnership or sole proprietorship: by a general partner or the proprietor, respectively.

c. For a municipality, state, federal, or other public agency: by either a principal executive officer or ranking elected official. For purposes of this part, a principal executive officer of a public agency includes:
(i) The chief executive officer of the agency, or
(ii) A senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency.

Section VII. Submittal Instructions.

Submit this form to the VSMP Authority that has jurisdiction for your construction activity. The VSMP Authority may be either DEQ or your locality depending on the location and type of project. If your project is under the jurisdiction of a Local VSMP Authority, please contact the locality for additional submittal instructions. A blank area is provided for the Local VSMP Authority to include their mailing address.

Who is the VSMP Authority for my project? DEQ or the locality?

- **DEQ**: DEQ is the VSMP Authority and administers permit coverage for land-disturbing activities that are:
  - within a locality that is not a VSMP Authority;
  - owned by the State or Federal government; or
  - utilizing approved Annual Standards and Specifications.

- **The Locality**: The local government (locality) is the VSMP Authority and administers permit coverage for all other projects not covered by DEQ as listed above. For these projects, please submit permit forms directly to the Local VSMP Authority. A list of Local VSMP Authorities is available on DEQ’s website here: Local VSMP Authority List.

DEQ’S CONSTRUCTION GENERAL PERMIT WEBSITE

I. SUMMARY

The project consists of furnishing and installing approximately 5,300 linear feet of 24-inch, 60 linear feet of 18-inch, 130 linear feet of 12-inch, and 200 linear feet of 8-inch diameter sanitary sewer line and the eliminate one pump station and approximately 2,000 linear feet of 12-inch water line, and all necessary appurtenances. This project will occur between Gordon Rd and Enchanted Woods Way in Spotsylvania County, VA.

II. WORK COVERED BY THE CONTRACT DOCUMENTS

A. Work under this contract includes furnishing and installing sewer line, water line and associated appurtenances as follows:

i. Furnish, erect, maintain and remove erosion and sediment control measures including silt fencing, construction entrances, and other items as required.

ii. Clear and grub the area of construction of the new sewer and water lines.

iii. Furnish and install sanitary sewer mains, manholes, and service lateral connections at locations and grades shown on the plans.

iv. Furnish and install water lines, hydrants, valves, service connections and meter barrels at locations and grades shown on the plans.

v. Furnish and install all other appurtenances shown or required to complete the sanitary sewer and water line work.

vi. Abandon and removal of the pump station and other items as required on the plans.

B. Contingent Items – If contingent items are included in the project, they shall not be performed without written direction and authorization by ENGINEER, if agreed to by the OWNER.
C. Work consists of providing labor, materials, equipment, services and administration required in conjunction with or properly incidental to construction of the project. All work shall be performed in accordance with Federal, State and Local regulations and OSHA requirements.

III. SPOTSYLVANIA COUNTY SPECIFICATIONS – General information


B. All excavation is considered Unclassified. Spotsylvania County has not conducted an underground investigation of the site.

C. The Contractor shall provide initial stakeout of water and sewer line project and will be the responsible for any further stakeout.

D. The County will perform the as-built survey plans for the project. The contractor shall provide the County with the construction plans with redline mark ups.

E. Spotsylvania County Land Disturbance permit to be obtained by the Contractor.

F. Wetland restoration shall be performed per requirements on the plans and within the permits.
ATTACHMENT C

DRAWINGS

Massaponax Interceptor Replacement Phase IV

INVITATION FOR BID (IFB #20-03-EG)

August 27, 2019
PROPOSED INTERCEPTOR
MASSAPONAX CREEK
Old Plank Road       Rt. 610
Gordon Road      Rt. 627
Road Rt. 674
Road Rt. 674
Chancellor
Thorburn
Lewis Rt. 743

PROPOSED WATER MAIN

INDEX SHEET

SCALE: 1" = 500'

SHEET NOT IN THIS CONTRACT

SHEET NUMBER AND VIEW ORIENTATION

COUNTY OF SPOTSYLVANIA, VIRGINIA
DEPARTMENT OF UTILITIES
600 HUDGINS ROAD  FREDERICKSBURG, VIRGINIA 22408

WHITMORE, REQUARDT & ASSOCIATES, LLP
9030 STONY POINT PARKWAY, SUITE 220, RICHMOND, VIRGINIA 23235
MATCH LINE   STA. 51+50 SEE SHEET 8
MATCH LINE   STA. 39+50 SEE SHEET 6

MASSAPONAX CREEK
NOT IN THIS CONTRACT
CUT-IN MANHOLE DETAIL (CMH)

MANHOLE VENT DETAIL

MANHOLE BASE DETAIL

NOTES:
1. Float vent valve ball check shall be DR. 280-130-05 in stainless steel. Connection shall be a 3/4" NPT.

MANHOLE DETAIL
SCALE: N.S.

SHEET

County of Spotsylvania, Virginia
Department of Utilities
600 Mask Drink Road
Fredericksburg, Virginia 22408

Whitman, Requardt & Associates, LLP
9030 Stony Point Parkway, Suite 220
Richmond, Virginia 23235

DETAILS

Sheet 14 of 22
WETLAND CONSTRUCTION NOTES

WETLAND SEEDING REQUIREMENTS

LIVESTAKES, SPACED 2' O.C. IN TWO STAGGERED ROWS, EACH BANK (108 TOTAL)

STREAM CROSSING CONSTRUCTION NOTES

SEEDING NOTES
REGENCY GLEN DRIVE
(RTE. 1809)

20 TRANSPORTATION MANAGEMENT PLAN

County of Spotsylvania, Virginia
Department of Utilities
600 Hudgins Road
Fredericksburg, Virginia 22408

Whitman, Requardt & Associates, LLP
9030 Stony Point Parkway, Suite 220
Richmond, Virginia 23235

REGENCY GLEN DRIVE
NOT IN THIS CONTRACT

Public Communications Plan Notes

Notification of construction started dates and work zone information will be entered into the VA Traffic system.

Transportation Operations Plan

1. The process to notify the Regional Traffic Operations Center to place lane closure information on the 911 system and VDOT Traffic will be:
   a. VDOT traffic center personnel will contact the Regional Traffic Operations Center and will input lane closure information.
   b. Construction Manager is to advise the VDOT project manager that lane closures have been placed.
   c. VDOT Traffic Operations Center is to advise the Regional Traffic Operations Center.
   d. Notification will be made to Regional Traffic Operations Center.

2. The following is a list of Local Emergency contact agencies:
   a. Virginia State Police
   b. State Police District
   c. State Police District
   d. State Police District
   e. State Police District

3. The following is a list of Local Emergency contact agencies:
   a. Virginia State Police
   b. State Police District
   c. State Police District
   d. State Police District
   e. State Police District

4. Process of notification of incident to follow:
   a. Contractor to call:
      i. Regional Traffic Operations Center
      ii. State Police District
      iii. State Police District
      iv. State Police District
      v. State Police District
   b. Depending upon severity of incident, contractor may call 911.
   c. If incident is severe, contractor should call 911.

5. Incident or any change in traffic operations plan.

6. Incident or any change in traffic operations plan.

NOT IN THIS CONTRACT

Sheet 20 of 29

County of Spotsylvania, Virginia
Department of Utilities

WRA
Whitman, Requardt & Associates, LLP
9030 Stony Point Parkway, Suite 220
Richmond, Virginia 23235

Masseponax Intercepter Replacement, American Central Branch-Phase 4
TRANSPORTATION MANAGEMENT PLAN

NOT IN THIS CONTRACT
ATTACHMENT D
Bid Form
IFB #20-03-EG
Massaponax Interceptor Replacement Phase IV

In compliance with this Invitation for Bid, Addenda and to all the Terms and Conditions imposed therein and hereby incorporated by reference, the authorized undersigned offers and agrees to furnish the goods/services at the price(s) indicated on the Bid Form, in accordance with this Signed Bid Form.

The signer of this bid form must be an authorized officer of the company.
(Please include any documentation of authority. For example, resolution of the board of directors, articles of incorporation, etc.)

Name and Address of Firm: _____________________________________________ Date: _____________________________________________

___________________________________________ By: _____________________________________________

(Signature In Ink)

___________________________________________ Name: _____________________________________________

(Please Print)

_________________________Zip Code: __________ Title: _____________________________________________

EIN: _________________________________________ E-mail: ____________________________________________

Phone: (_____)______________________________ Fax: (_____)________________________________________

If Corporation or LLC, list State of Incorporation or Corporation: _____________________________________________

Contractors License Number: _____________________________

Commonwealth of Virginia State Corporation Commission Number: _____________________________________________

(ATTACH A COPY OF YOUR STATE CORPORATION COMMISSION CERTIFICATE AND A LIST OF OFFICERS)

D-U-N-S Number: _________________________________________

The named party hereby submits a bid in response to this Spotsylvania County IFB to furnish construction services and materials as described in the Specification and bid form to this IFB. The entire Bid form, including Response Statement, license certifications, and any supplemental materials required to be provided by the bidder pursuant to the terms and conditions of the IFB, constitute the entire bid submission.

The party hereby certifies that such bid is genuine and not collusive or sham; that said bidder has not colluded, conspired, connived or agreed, directly or indirectly, with any bidder or person, to put in a sham bid or to refrain from bidding, and has not in any manner, directly or indirectly, sought by agreement or collusion or communication or conference, with any person to fix the bid price or affiant or any bidder, or to fix any overhead, profit or cost element of said bid price, or of that of any other bidder, or to secure any advantage against Spotsylvania County or any person interested in the proposed contract.

The party submitting the forgoing bid acknowledges the provisions, terms and conditions of this IFB including all attachments and addenda, and agrees to be bound by those provisions, terms and conditions. Further, the party certifies that all information submitted in response to this IFB is correct and true.

Receipt of the following Addenda are acknowledged:

Addendum No. ____________, dated ____________ Addendum No. ____________, dated ____________

Addendum No. ____________, dated ____________ Addendum No. ____________, dated ____________

Addendum No. ____________, dated ____________ Addendum No. ____________, dated ____________

(ATTACH A COPY OF YOUR STATE CORPORATION COMMISSION CERTIFICATE AND A LIST OF OFFICERS)

D-U-N-S Number: _________________________________________

The named party hereby submits a bid in response to this Spotsylvania County IFB to furnish construction services and materials as described in the Specification and bid form to this IFB. The entire Bid form, including Response Statement, license certifications, and any supplemental materials required to be provided by the bidder pursuant to the terms and conditions of the IFB, constitute the entire bid submission.

The party hereby certifies that such bid is genuine and not collusive or sham; that said bidder has not colluded, conspired, connived or agreed, directly in directly, with any bidder or person, to put in a sham bid or to refrain from bidding, and has not in any manner, directly or indirectly, sought by agreement or collusion or communication or conference, with any person to fix the bid price or affiant or any bidder, or to fix any overhead, profit or cost element of said bid price, or of that of any other bidder, or to secure any advantage against Spotsylvania County or any person interested in the proposed contract.

The party submitting the forgoing bid acknowledges the provisions, terms and conditions of this IFB including all attachments and addenda, and agrees to be bound by those provisions, terms and conditions. Further, the party certifies that all information submitted in response to this IFB is correct and true.

Receipt of the following Addenda are acknowledged:

Addendum No. ____________, dated ____________ Addendum No. ____________, dated ____________

Addendum No. ____________, dated ____________ Addendum No. ____________, dated ____________

Addendum No. ____________, dated ____________ Addendum No. ____________, dated ____________

(ATTACH A COPY OF YOUR STATE CORPORATION COMMISSION CERTIFICATE AND A LIST OF OFFICERS)

D-U-N-S Number: _________________________________________

The named party hereby submits a bid in response to this Spotsylvania County IFB to furnish construction services and materials as described in the Specification and bid form to this IFB. The entire Bid form, including Response Statement, license certifications, and any supplemental materials required to be provided by the bidder pursuant to the terms and conditions of the IFB, constitute the entire bid submission.

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Addendum No. ____________, dated ____________ Addendum No. ____________, dated ____________

Addendum No. ____________, dated ____________ Addendum No. ____________, dated ____________

(RETURN THIS FORM)
Response Statement

This Response Form is to be completed by the Bidder to more specifically describe and define the proposed services. Any deviations from the IFB specifications shall be stated on this form or attached to this form.

1. **Item Description**

    Massaponax Interceptor Replacement Phase IV

2. **Deviations from IFB Specifications**

Sign here to confirm accuracy of Bid Form and conformity with provisions of IFB #20-03-EG

Signature: ___________________________ Name of Firm ___________________________

(RETURN THIS FORM)
ATTACHMENT D
Bid Form
IFB #20-03-EG
Massaponax Interceptor Replacement Phase IV

A list of 3 References for which the Contractor has provided similar work over the last 5 years similar in Scope to that which is described herein shall be provided with the Bid Package. **Spotsylvania County cannot be listed as a reference.**

**Please list references below:**

Company Name: _________________________
Address: ______________________________________
Phone Number: _________________________
Email Contact: _________________________
Project Name: _________________________
Location Address: _________________________
Additional Information: _________________________

Company Name: _________________________
Address: ______________________________________
Phone Number: _________________________
Email Contact: _________________________
Project Name: _________________________
Location Address: _________________________
Additional Information: _________________________

Company Name: _________________________
Address: ______________________________________
Phone Number: _________________________
Email Contact: _________________________
Project Name: _________________________
Location Address: _________________________
Additional Information: _________________________

**Sign here to confirm accuracy of Bid Form and conformity with provisions of IFB #20-03-EG**

Signature: _________________________
Name of Firm: _________________________

(RETURN THIS FORM)
ATTACHMENT D
Bid Form
IFB #20-03-EG
Massaponax Interceptor Replacement Phase IV

Provide construction services and materials to complete the Massaponax Interceptor Replacement Phase IV project as described in the Spotsylvania County IFB #20-03-EG Specifications, and Construction Drawings.

PART A – LUMP SUM AND UNIT PRICE ITEMS

<table>
<thead>
<tr>
<th>ITEM</th>
<th>DESCRIPTION</th>
<th>UNIT</th>
<th>QTY</th>
<th>UNIT PRICE</th>
<th>TOTAL PRICE</th>
</tr>
</thead>
<tbody>
<tr>
<td>A-1</td>
<td>Mobilization</td>
<td>L.S.</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A-2</td>
<td>Construction Entrance, Complete, In-Place</td>
<td>EA.</td>
<td>2</td>
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<tr>
<td>A-3</td>
<td>Clearing and Grubbing, Complete</td>
<td>AC.</td>
<td>6.6</td>
<td></td>
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</tr>
<tr>
<td>A-4</td>
<td>Silt Fence, Complete, In-Place</td>
<td>L.F.</td>
<td>884</td>
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</tr>
<tr>
<td>A-5</td>
<td>Super Silt Fence, Complete, In-Place</td>
<td>L.F.</td>
<td>5,494</td>
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<tr>
<td>A-6</td>
<td>Dewatering Structure, Complete</td>
<td>EA.</td>
<td>4</td>
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<tr>
<td>A-7</td>
<td>Utility Stream Crossing, Complete, In-Place</td>
<td>EA.</td>
<td>2</td>
<td></td>
<td></td>
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<tr>
<td>A-8</td>
<td>Temporary Vehicular Stream Crossing, Complete, In-Place</td>
<td>EA.</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A-9</td>
<td>Turbidity Curtain, Complete, In-Place</td>
<td>L.F.</td>
<td>69</td>
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</tr>
<tr>
<td>A-10</td>
<td>Permanent Seeding, Complete, In-Place</td>
<td>AC.</td>
<td>6.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A-11</td>
<td>24&quot; Dia. PS 115 PVC Gravity Sewer, Complete, In-Place</td>
<td>L.F.</td>
<td>5,341</td>
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<tr>
<td>A-12</td>
<td>18&quot; Dia. PS 115 PVC Gravity Sewer, Complete, In-Place</td>
<td>L.F.</td>
<td>61</td>
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<tr>
<td>A-13</td>
<td>12&quot; Dia. SDR 26 PVC Gravity Sewer, Complete, In-Place</td>
<td>L.F.</td>
<td>136</td>
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<td>A-14</td>
<td>8&quot; Dia. SDR 26 PVC Gravity Sewer, Complete, In-Place</td>
<td>L.F.</td>
<td>218</td>
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</tbody>
</table>

Name of Firm: __________________________  

(RETURN THIS FORM)
<table>
<thead>
<tr>
<th>ITEM</th>
<th>DESCRIPTION</th>
<th>UNIT</th>
<th>QTY</th>
<th>UNIT PRICE</th>
<th>TOTAL PRICE</th>
</tr>
</thead>
<tbody>
<tr>
<td>A-15</td>
<td>12&quot; Dia. DI Class 52 Water Main, Complete, In-Place</td>
<td>L.F.</td>
<td>2,086</td>
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<tr>
<td>A-16</td>
<td>12&quot; Gate Valve and Box, Complete, In-Place</td>
<td>EA</td>
<td>3</td>
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<tr>
<td>A-17</td>
<td>Fire Hydrant Assembly, Complete, In-Place</td>
<td>EA</td>
<td>3</td>
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<tr>
<td>A-18</td>
<td>4'-0&quot; Dia. Precast Conc. Manhole with Watertight Frame and Cover, Complete, In-Place</td>
<td>EA.</td>
<td>9</td>
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<tr>
<td>A-19</td>
<td>5'-0&quot; Dia. Precast Conc. Manhole with Watertight Frame and Cover, Complete, In-Place</td>
<td>EA.</td>
<td>10</td>
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<tr>
<td>A-20</td>
<td>4'-0&quot; Dia. Precast Conc. Drop Manhole with Watertight Frame and Cover, Complete, In-Place</td>
<td>EA.</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A-21</td>
<td>5'-0&quot; Dia. Precast Conc. Drop Manhole with Watertight Frame and Cover, Complete, In-Place</td>
<td>EA.</td>
<td>3</td>
<td></td>
<td></td>
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<tr>
<td>A-22</td>
<td>Remove and Replace Existing Manhole with 4'-0&quot; Dia. Precast Conc. Manhole and Watertight Frame and Cover, Complete, In-Place</td>
<td>EA.</td>
<td>6</td>
<td></td>
<td></td>
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<tr>
<td>A-23</td>
<td>Remove and Replace Existing Manhole with 4'-0&quot; Dia. Precast Conc. Drop Manhole and Watertight Frame and Cover, Complete, In-Place</td>
<td>EA.</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A-24</td>
<td>Decommission PS 20 Pumping Station, Complete</td>
<td>L.S.</td>
<td>1</td>
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</tr>
<tr>
<td>A-25</td>
<td>1” Air Release Valve, Complete, In-place</td>
<td>EA.</td>
<td>1</td>
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<tr>
<td>A-26</td>
<td>Class I Rip Rap for Stream Bank Stabilization Measures</td>
<td>C.Y.</td>
<td>34</td>
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<tr>
<td>A-27</td>
<td>Coir Fiber Matting for Stream Bank Stabilization Measures</td>
<td>S.Y.</td>
<td>50</td>
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<tr>
<td>A-28</td>
<td>Live Steaks for Stream Bank Stabilization Measures</td>
<td>EA.</td>
<td>614</td>
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<tr>
<td>A-29</td>
<td>Stream Restoration, Complete</td>
<td>L.S.</td>
<td>1</td>
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</table>

Total – Part A

Name of Firm: ________________________________

(RETURN THIS FORM)
### PART B - CONTINGENT ITEMS

<table>
<thead>
<tr>
<th>ITEM</th>
<th>DESCRIPTION</th>
<th>UNIT</th>
<th>QTY</th>
<th>UNIT PRICE</th>
<th>TOTAL PRICE</th>
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</thead>
<tbody>
<tr>
<td>B-1</td>
<td>Unclassified Excavation, Complete</td>
<td>C.Y.</td>
<td>100</td>
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<tr>
<td>B-2</td>
<td>Porous Backfill, Complete, In-Place</td>
<td>C.Y.</td>
<td>100</td>
<td></td>
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</tr>
<tr>
<td>B-3</td>
<td>Borrow Material (AASHTO M145), Complete, In-Place</td>
<td>C.Y.</td>
<td>150</td>
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</tr>
<tr>
<td>B-4</td>
<td>Additional Test Pits, As Directed by the Engineer</td>
<td>EA.</td>
<td>5</td>
<td></td>
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<tr>
<td>B-5</td>
<td>Over-Excavation of Unsuitable Subgrade w/ Porous Refill, Complete</td>
<td>C.Y.</td>
<td>450</td>
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</tr>
<tr>
<td>B-6</td>
<td>Testing and Laboratory Testing Services (ALLOWANCE)</td>
<td>LS</td>
<td>1</td>
<td>$20,000.00</td>
<td>$20,000.00</td>
</tr>
<tr>
<td>B-7</td>
<td>EC-2 Geotextile, Complete, In-Place</td>
<td>S.Y.</td>
<td>20</td>
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</tr>
<tr>
<td>B-8</td>
<td>Remove and Replace Existing 6 ft. Wooden Stockade Fence, Complete, In-Place</td>
<td>L.F.</td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B-9</td>
<td>Remove and Replace Existing 4 ft. Chain Link Fence, Complete, In-Place</td>
<td>L.F.</td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B-10</td>
<td>Remove and Replace Existing 6 ft. Chain Link Fence, Complete, In-Place</td>
<td>L.F.</td>
<td>100</td>
<td></td>
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</tr>
<tr>
<td>B-11</td>
<td>Remove and Replace Existing Wooden Split Rail Fence, Complete, In-Place</td>
<td>L.F.</td>
<td>100</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Total – Part B**

**TOTAL BID PRICE**

Total Part A + Total Part B = TOTAL BID PRICE

Sign here to confirm accuracy of Bid Form and conformity with provisions of IFB #20-03-EG

Signature: __________________________ Name of Firm: __________________________

(RETURN THIS FORM)