ARLINGTON COUNTY, VIRGINIA
OFFICE OF THE PURCHASING AGENT
2100 CLARENDON BOULEVARD, SUITE 500
ARLINGTON, VA 22201
(703) 228-3410

INVITATION TO BID NO. 21-CPHD-ITB-271

ELECTRONIC SEALED BIDS WILL BE RECEIVED BY ARLINGTON COUNTY VIA VENDOR REGISTRY UNTIL 3:00 P.M. ON THE 29TH DAY OF OCTOBER 2020.

FOR THE PROVISION OF STREET IMPROVEMENT PROJECT ALONG N HIGHLAND STREET FROM ARLINGTON BLVD TO 1ST ROAD N.

VENDORS ARE REQUIRED TO REGISTER ON VENDOR REGISTRY IN ORDER TO SUBMIT A RESPONSE TO THIS INVITATION TO BID. NO RESPONSES WILL BE ACCEPTED AFTER THE BID DUE DATE AND TIME.

The County will conduct a virtual bid opening via Microsoft Teams Application (APP). Bidders interested in viewing the public bid opening must download the APP and join the meeting via the Microsoft Teams APP and enable audio, video or both. The link to join the virtual bid opening is provided below:

Join Microsoft Teams Meeting
+1 347-973-6905 United States, New York City (Toll)
Conference ID: 775 791 641#

Bid Surety in the amount of not less than 5% of the bid must be submitted with the bid. Performance and Payment Bonds in the amount of 100% of the award will be required of the successful bidder.

PREBID CONFERENCE

A virtual prebid conference will be held at 10 a.m., October 8th, 2020 on Microsoft Teams to allow potential Bidders an opportunity to obtain clarification of the specifications and requirements of the solicitation. To join the meeting, please click the following link Join Microsoft Teams Meeting, or join by dialing +1 347-973-6905 and enter Conference ID #563 605 990. ATTENDANCE AT THE PREBID CONFERENCE IS OPTIONAL. Minutes of the prebid conference will be recorded by the County and may be incorporated into the solicitation documents through an Addendum. Interested Bidders are, however, urged to attend.

NOTICE: ANY BIDDER ORGANIZED AS A STOCK OR NONSTOCK CORPORATION, LIMITED LIABILITY COMPANY, BUSINESS TRUST, OR LIMITED PARTNERSHIP OR REGISTERED AS A LIMITED LIABILITY PARTNERSHIP MUST BE AUTHORIZED TO TRANSACT BUSINESS IN THE COMMONWEALTH OF VIRGINIA PRIOR TO SUBMITTING A BID (REFER TO AUTHORITY TO TRANSACT BUSINESS SECTION IN THE SOLICITATION FOR FURTHER INFORMATION)

Arlington County reserves the right to reject any and all bids, cancel this solicitation, and to waive any informalities or irregularities in procedure. A bidder's submission of a bid indicates acceptance of these terms.

Arlington County, Virginia
Office of the Purchasing Agent

Sy Gezachew
Procurement Officer
sgezachew@arlingtonva.us

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I. INFORMATION FOR BIDDERS

1. QUESTIONS AND ADDENDA

BIDDERS MUST BE REGISTERED IN VENDOR REGISTRY TO SUBMIT A QUESTION FOR THIS INVITATION TO BID.

All communications relating to this solicitation must be submitted online using Vendor Registry. For a question to be considered, the question must be entered in the Question Section of the **ITB No. 21-CPHD-ITB-271**. Prior to the award of a contract resulting from this solicitation, bidders are prohibited from contacting any County staff other than those assigned to the Office of the Purchasing Agent.

QUESTIONS REGARDING THE ORIGINAL SOLICITATION MUST BE SUBMITTED BY OCTOBER 15TH, 2020, AT 5:00 PM EASTERN TIME TO BE CONSIDERED FOR AN ADDENDUM. ALL QUESTIONS RECEIVED BY THE QUESTION DEADLINE WILL BE RESPONDED TO WITHIN VENDOR REGISTRY AND POSTED FOR ALL BIDDERS. THE SYSTEM WILL NOT ACCEPT ANY QUESTIONS AFTER THIS DATE AND TIME.

If any questions or responses require revisions to this solicitation, such revisions will be by formal Addendum only. Bidders are cautioned not to rely on any written, electronic, or oral representations made by any County representative or other person, including the County's technical contact, that appear to change any portion of the solicitation unless the change is ratified by a written Addendum to this solicitation issued by the Office of the Purchasing Agent.

2. INTEREST IN MORE THAN ONE BID AND COLLUSION

Reasonable grounds for believing that a Bidder is interested in more than one bid for a solicitation, including both as a Bidder and as a subcontractor for another Bidder, or that collusion exists between two or more Bidders, will result in rejection of all affected bids. However, an individual or entity acting only as a subcontractor may be included as a subcontractor on bids of two or more different Bidders. Bidders rejected under the above provision will also be disqualified if they respond to a re-solicitation for the same work.

3. TRADE SECRETS OR PROPRIETARY INFORMATION

Trade secrets or proprietary information that a bidder or contractor submits in connection with a procurement transaction may be exempted from public disclosure under the Virginia Freedom of Information Act ("VFOIA"). However, the bidder or contractor must invoke VFOIA protection clearly and in writing on the Bid Form for County review. The Bid Form must include at least the following: (1) the data or other materials sought to be protected and (2) specific reasons why the material is confidential or proprietary. It is the bidder's sole responsibility to defend such exemptions if challenged in a court of competent jurisdiction.

4. DEBARMENT STATUS

The Bidder must indicate on the Bid Form whether it or any of its principals is currently debarred from submitting bids to the County or to any other state or political subdivision and whether the Bidder is an agent of any person or entity that is currently debarred from submitting bids to the County or to any other state or political subdivision. An affirmative response may be considered grounds for rejection of the bid.

5. AUTHORITY TO TRANSACT BUSINESS

Any Bidder organized as a stock or nonstock corporation, limited liability company, business trust, or limited partnership or registered as a registered limited liability partnership must be authorized to transact business in the Commonwealth of Virginia as a domestic or foreign business entity if so required by Title 13.1 or Title 50 of the Code of Virginia, or as otherwise required by law. The proper and full legal name of the entity and the identification number issued to the Bidder by the Virginia State Corporation Commission must be included on the Bid Form. Any Bidder that is not required to be authorized to transact business in the Commonwealth must include in its bid a statement describing why the Bidder is not required to be so authorized. The County may require a Bidder to provide documentation that 1) clearly identifies the complete name and legal form of the entity and 2) establishes that the entity is authorized by the State Corporation Commission to transact business in the Commonwealth of Virginia. Failure of a Bidder to provide such documentation will be a ground for rejection of the bid or cancellation of any award. For further information refer to the Commonwealth of Virginia State Corporation Commission website at: www.scc.virginia.gov.

6. ARLINGTON COUNTY BUSINESS LICENSES

The successful Bidder must comply with the provisions of Chapter 11 ("Licenses") of the Arlington County Code, if applicable. For information on the provisions of that Chapter and its applicability to this solicitation, contact the Arlington County Business License Division, Office of the Commissioner of the Revenue, at 2100 Clarendon Blvd., Suite 200, Arlington, Virginia, 22201, tel. (703) 228-3060, or e-mail mailto: business@arlingtonva.us.

7. VIRGINIA CONTRACTOR LICENSE

For all work that is classified as being performed by "Contractors" as defined by the Virginia State Board for Contractors, a Class A, B, or C License is required.

If a contract for performing or managing construction, removal, repair or improvements is for $120,000 or more, or if the total value of all such construction, removal, repair, or improvements undertaken by the bidder within any twelve-month period is $750,000 or more, the bidder is required under Title 54.1, Chapter 11, Code of Virginia, as amended, to be licensed as a "CLASS A CONTRACTOR."

If a contract for performing or managing construction, removal, repair or improvements is for $10,000 or more, but less than $120,000, or if the total value of all such construction, removal, repair, or improvements undertaken by the bidder within any twelve-month period is $150,000 or more, but less than $750,000, the bidder is required under Title 54.1, Chapter 11, Code of Virginia, as amended, to be licensed as a "CLASS B CONTRACTOR."

If a contract for performing construction, removal, repair or improvements is for $1,000 or more, but no more than $10,000 or if the total value of all such construction, removal, repair, or improvements undertaken by the bidder within any twelve-month period is less than $150,000, the bidder is required under Title 54.1, Chapter 11, Code of Virginia, as amended, to be licensed as a "CLASS C CONTRACTOR." Class C contractors shall not include electrical, plumbing, and heating, ventilation and air conditioning contractors.

For further information, contact the State Board for Contractors, 2 South Ninth Street, Richmond, VA 23219, (804) 367-8511.

8. BID FORM SUBMISSION

The submitted Bid Form must be signed and fully executed. The Bid Form must be submitted electronically via Vendor Registry no later than the date and time specified in this solicitation. The Vendor Registry system will not accept bids after the close date and time. The County will not accept emailed or faxed bid

The Bidder name on the electronic bid submittal shall be the same as the Contractor/Vendor name as the registration in Vendor Registry for the upload to be considered a valid bid. ONLY ELECTRONIC SUBMISSION IS ALLOWED, NO BID SUBMITTED OTHER THAN A VENDOR REGISTRY ELECTRONIC UPLOAD WILL BE ACCEPTED. **Arlington County is not responsible for late submissions, missed Addendums, or questions not submitted before the end date and time.**

Timely submission is solely the responsibility of the Bidder. The Vendor Registry System will not accept applications after the publicly posted date and time. A bid may be rejected if the Bid Form is not signed in the designated space by a person authorized to legally bind the Bidder.

Modification of or additions to the Bid Form may be cause for rejection of the bid; however, Arlington County reserves the right to decide, in its sole discretion, whether to reject such a bid as nonresponsive. As a precondition to bid acceptance, Arlington County may request the bidder to withdraw or modify any such modifications or additions, if it does not affect quality, quantity, price, or delivery.

Bids and all documents uploaded/submitted to Arlington County by a Bidder become the property of the County upon receipt.

9. BIDDER CERTIFICATION

Submission of a signed Bid Form is certification by the respective bidder that it is registered with the Virginia State Corporation Commission (SCC), if applicable, it is the legal entity authorized to enter into an agreement with the County, and that it will accept any award made to it as a result of the submission. Entry of a Bidder's SCC number may be required at Vendor Registration.

10. ERRORS IN EXTENSION

If the unit price and the extension price differ, the unit price will prevail.

11. EXCEPTIONS

Conditional or qualified bids containing exceptions, unless specifically allowed in the solicitation, are subject to rejection in whole or in part as nonresponsive.

12. NONCONFORMING TERMS AND CONDITIONS

If a bid contains alternate terms and conditions that do not conform to the terms and conditions in this solicitation, the bid will be subject to rejection for nonresponsiveness. The County reserves the right to permit a bidder to withdraw nonconforming terms and conditions from its bid prior to the County's determination of nonresponsiveness.

13. BIDDERS' RESPONSIBILITY TO INVESTIGATE

Before submitting a bid, each bidder must make all investigations necessary to ascertain all conditions and requirements affecting the full performance of the contract and to verify any representations made by the County upon which the bidder will rely. No pleas of ignorance of such conditions and requirements will relieve the successful bidder from its obligation to comply in every detail with all provisions and

requirements of the contract or will be accepted as a basis for any claim for any monetary consideration on the part of the successful bidder.

14. SITE INVESTIGATION AND CONDITIONS AFFECTING THE WORK

Each bidder is responsible for ascertaining the nature and locations of the Work of the solicitation, and for investigating the general and local conditions and factors which can affect the work or its cost, including but not limited to:

a. conditions bearing upon transportation, disposal, handling, and storage of materials;
b. the availability of labor, water, electric power, and roads;
c. uncertainties of weather, river stage, tides, or similar physical conditions at the site;
d. the conformation and conditions of the ground; and
e. the character of equipment and facilities needed before and during work performance.

Each bidder is responsible for investigating the character, quality, and quantity of surface and subsurface materials or obstacles to be encountered insofar as this information is reasonably ascertainable from an inspection of the site, including all exploratory work publicly or otherwise available, as well as from the drawings and specifications made a part of this solicitation.

The locations of existing utilities, including underground utilities, which may affect the work are indicated on the drawings or in the specifications insofar as their existence and location were known at the time of preparation of the drawings. However, nothing in these drawings or specifications shall be construed as a guarantee that such utilities are in the location indicated or that they actually exist, or that other utilities are not within the area of operations. The bidder shall make all necessary investigations to determine the existence and locations of such utilities.

The County assumes no responsibility for any conclusions or interpretations made by the bidder based on the information made available by the County. The County assumes no responsibility for any understanding reached or representation made concerning conditions which could affect the work by any of its officers or agents before the execution of the contract, unless that understanding, or representation is expressly stated in the Contract.

15. INCOMPLETE DOCUMENTS

Each bidder is responsible for having determined the accuracy and/or completeness of the solicitation documents upon which it relied in making its bid, and has an affirmative obligation to notify the Arlington County Purchasing Agent immediately upon discovery of an apparent or suspected inaccuracy, error in, or omission of any pages, drawings, sections, or addenda whose omission from the documents was apparent from a reference or page numbering or other indication in the solicitation documents.

If a bidder downloads an electronic version of the solicitation documents, that potential bidder is responsible for determining the accuracy and/or completeness of the electronic documents and ensuring that the electronic documents used in preparing the bid are the most current version of solicitation documents issued by the County.

If the successful bidder proceeds with any activity that may be affected by an inaccuracy, error in, or omission in the solicitation documents of which it is aware but has not notified the Arlington County Purchasing Agent, the bidder hereby agrees to perform any activity described in the missing or incomplete documents at bidder's sole expense and at no additional cost to Arlington County.

16. ERRONEOUS OR INFEASIBLE REQUIREMENTS

Each bidder is responsible for having determined the feasibility of the work required and shall notify the County Purchasing Agent immediately upon discovery of any apparent erroneous, contradictory, incomplete, or infeasible requirements or directions contained in the Solicitation Documents. If a bidder fails to notify the County of such conditions immediately upon discovery, the bidder assumes all responsibility for any and all work required to satisfy the contract requirements at no additional cost to the County and within the Time for Completion.

17. QUALIFICATION OF BIDDERS

In order to be considered responsible and responsive Bidders shall have the experience described below and provide the supporting documentation as instructed.

COMPANY QUALIFICATIONS:

Bidders shall have three (3) years of experience conducting public works infrastructure and street improvement projects in an urban environment. The experience shall be work of similar size and scope, construction, re-construction, and maintenance. The Bidder's obtained project experience shall consist of the following:

- State and County streets
- Curbs and gutters
- Sidewalks and walkways
- Driveway aprons
- Storm sewer pipes and inlets
- Wet Utilities
- Pavement markings and signage
- Streetscapes and related site work

Bidders shall provide a list of five (5) similar projects recently completed projects that involving the same material, equal size, and comparable length. For each project, Bidders shall list the following information:

- Project Name
- Project description and Bidder's scope of work within the project
- Project manager's name, telephone number and email address
- Work start date, scheduled completion, and actual completion date
- Initial contract cost and final contract cost

The experience of the contractor owner(s) may be imputed to a newly formed company/Contractor provided the Contractor owner(s) has/have at least five (5) years of demonstrated experience of reliability and meets the criteria set forth herein.

STAFFING QUALIFICATIONS:

Bidders shall have at least one (1) employee certified by VDOT in Basic Work Zone Traffic Control and shall have at least one (1) employee certified in OSHA 10. Bidders shall submit copy of these certificates with their bids.

In addition, the Purchasing Agent may require a bidder to demonstrate that it has the necessary facilities, ability, and financial resources to comply with the contract and furnish the service, material or goods specified herein in a satisfactory manner before the award of any contract. A bidder may also be required to provide past history and references. Failure to qualify according to the foregoing requirements will result in bid rejection.

18. ALTERNATE BID

Bidders who have other items they wish to offer in lieu of, or in addition to, what is required by this solicitation shall submit a separate bid clearly marked "ALTERNATE BID". Alternate bids will be automatically deemed nonresponsive.

19. INFORMALITIES

The County reserves the right to waive minor defects or variations from the exact requirements of the solicitation in a bid insofar as those defects or variations do not affect the price, quality, quantity, or delivery schedule of the services being procured. If insufficient information is submitted for Arlington County to properly evaluate a bid or a bidder; the County may request such additional information after bid opening, provided that the information requested does not change the price, quality, quantity, or delivery schedule for the services being procured.

20. USE OF BRAND NAMES/ "OR EQUIVALENT" BIDS

Unless identified as a "No Equivalent" item in the solicitation, the name of a certain brand, make or manufacturer does not restrict bidders to that specific brand, make or manufacturer. The use of the brand, make or manufacturer's identification is intended to convey the general type, style, character, and quality of the article described. When a brand name is specified and followed by the phrase "or approved equal," the brand name product may be substituted if a suitable equivalent considering quality, workmanship, economy of operation, and suitability for the intended us, is accepted by the County Purchasing Agent.

The County may accept any equivalent item(s) that it considers suitable for the intended use.

For those items not identified as "No Equivalent", and followed by the phrase "or approved equal," the County has established the following procedure for determining the equivalency of a particular item:

Bidder Submission of Proposed Equivalent Item(s):

1) Bidder shall submit to the County its proposed item(s) for determination of their equivalency to the Brand Name(s) specified.

2) Each proposed item must be described on a separate page, indicating the appropriate specification section number, product or fabrication or installation method to be replaced, and specifics of the proposed item. Attach any technical information, photographs, brochures and the relevant data listed below that supports the proposed item and will permit the County to fairly determine acceptability of the item proposed:

a. Reasons why the specified product cannot be provided, if applicable.
b. Coordination information, including a list of changes or modifications needed to other parts of the Work that will be necessary to accommodate proposed substitution.
c. Detailed comparison of significant qualities of proposed substitution with those of the product specified.
d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
e. Samples, where applicable or requested.
f. List of similar installations for completed projects with project names and addresses and names and addresses of Architects and owners, if requested.
g. Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
h. Statement of impact on the construction schedule. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating lack of availability or delays in delivery.
i. Cost information.
j. Contractor's certification that proposed substitution complies with requirements in the Contract Documents and is appropriate for applications indicated.

3) The County will consider factors provided in the project technical specifications, such as relative costs, equivalency of features, serviceability, and the design of the item proposed.

4) All pages of the submission shall be marked with the name, address and contact information of the bidder, and sent via email to the Office of the Purchasing Agent to arrive prior to the question deadline established in Section I., paragraph I. ADDITIONAL INFORMATION. E-mail transmittals will be accepted at sgezachew@arlingtonva.us.

County Review of Proposed Equivalent Item(s):

1) Approved item(s) will be added to the solicitation, in the form of an Addendum to the solicitation, and forwarded to all bidders of record.

2) Bidders whose item(s) have not been approved will be so advised in writing simultaneously with the issuance of the Addendum.

21. NEW MATERIAL

Unless otherwise provided for in this solicitation, all goods, materials, supplies, or components offered to the County under this bid solicitation must be new, not used or reconditioned, and are not of such age or so deteriorated as to impair their usefulness or safety and that the goods, materials, supplies, or components offered are current production models of the respective manufacturer. If a bidder believes that furnishing used or reconditioned goods, materials, supplies or components will be in the County's interest, the bidder shall notify the County Purchasing Agent in writing no later than fifteen (15) calendar days prior to the date set for opening of bids. The notice shall include the reasons for the request and any benefits which may accrue to the County if the Purchasing Agent authorizes the bidding of used or reconditioned goods, materials, supplies or components.

22. BID WITHDRAWAL PRIOR TO BID OPENING

The Bidder may withdraw a bid from Vendor Registry before the opening date and time. It is the sole responsibility of the Bidder to remove and/or resubmit a bid before the bid deadline.

23. WITHDRAWAL OF BID FROM CONSIDERATION AFTER BID OPENING

After the opening of a bid, a bidder may withdraw its bid from consideration if the price of the bid is substantially lower than other bids due solely to a mistake therein, provided the bid is submitted in good faith, the mistake is a clerical mistake as opposed to a judgment mistake, and is actually due to an unintentional arithmetic error or an unintentional omission of a quantity of work, labor or material made directly in the compilation of the bid, which unintentional error or unintentional omission can be clearly shown by objective evidence drawn from inspection of original work papers, documents and materials used in the preparation of the bid sought to be withdrawn. No partial withdrawals of bids will be permitted after the time and date set for the bid opening. The bidder must give an electronic written notice to the Arlington County Purchasing Agent of a claim of right to withdraw a bid and provide all work papers, documents and other materials used in the preparation of the bid sought to be withdrawn, within two (2) business days after the date of bid opening. A bid may also be withdrawn if the County fails to award or issue a notice of intent to award the bid within ninety (90) days after the date fixed for opening bids.

24. METHOD OF AWARD

The County will award to the lowest responsive and responsible bidder. The lowest bidder will be determined by the bidder who provides the lowest project total.

25. NOTICE OF DECISION TO AWARD

When the County has made a decision to award a contract(s), the County will post a Notice of Award or Intent to Award to Vendor Registry.

26. INSURANCE REQUIREMENTS

Each bidder must be able to demonstrate proof of the specific coverage requirements and limits applicable to this solicitation. If the bidder is not able to do so, it may propose alternate insurance coverage for consideration by the County. Written requests for consideration of alternate coverage must be received by the County Purchasing Agent at least 10 working days prior to bid due date. If the County permits alternate coverage, an amendment to the Insurance Checklist will be issued prior to the time and date set for receipt of bids.

27. SURETY REQUIRED

Companies who wish to implement digital signatures during the COVID-19 public health emergency may do so, along with a SURETY BOND SEAL ADDENDUM which contains an electronic corporate seal and states the following:

"Due to logistical issues associated with the use of traditional seals during this COVID-19 pandemic, [Surety Company] has authorized its Attorney-in-Fact to affix [Surety Company's] corporate seal to any bond executed on behalf of [Surety Company] by any such Attorney-in-Fact by attaching this Addendum to said bond.

To the extent this Addendum is attached to a bond that is executed on behalf of [Surety Company] by its Attorney-in-Facts, [Surety Company\ hereby agrees that the seal below shall be deemed affixed to said bond to the same extent as if its raised corporate seal was physically affixed to the face of the bond."

A. BID SURETY:

A fully completed and properly executed original Bid Bond, cashier's check, certified check, money order, or cash escrow in the amount of 5% of the amount of the bid made payable to the Treasurer of Arlington County shall accompany each bid. The Bid Surety will be retained until after the award to the successful bidder. The Bid Surety of the successful bidder will be retained until completion of the Contract or the posting of a Performance Bond, whichever occurs sooner. A bid submitted without a proper bid surety will be rejected.

B. FAILURE TO EXECUTE:

The failure of a bidder to accept an award and file acceptable Performance and Payment Bonds within ten (10) days after award notice will cause cancellation of the award and the forfeiture of the Bid Surety to the County.

C. PERFORMANCE SURETY:

A fully completed and properly executed original Performance Bond in the amount of 100% of the amount of the bid will be required of the successful bidder to ensure satisfactory completion of the work. The bond shall be a corporate surety bond issued by a surety company authorized to do business in the Commonwealth of Virginia and acceptable to the County. Where applicable, the Performance Bond shall be renewable annually in the original amount through the completion of the Contract, including all warranty and guarantee periods.

D. PAYMENT BOND:

A fully completed and properly executed original Payment Bond in the amount of 100% of the amount of the bid, will be required of the successful bidder to ensure payment of all persons who have and fulfill contracts for the Contractor for performing labor, providing equipment, or providing material in the performance of the work provided for in the Contract. The Bond shall be a corporate surety bond issued by a surety company authorized to do business in the Commonwealth of Virginia and acceptable to the County. Where applicable, the Payment Bond shall be renewable annually in the original amount for the duration of the Contract.

28. EXECUTION OF CONTRACT

Within three days after the Contract is presented to the successful Bidder for signature, the Contractor must submit to the County Purchasing Agent the original of the executed Agreement. Within ten days the Contractor must submit executed performance and payment bonds and required certificate of insurance. Failure to do so shall constitute a default, and the County may award the Contract to the next lowest responsive and responsible bidder or solicit new bids. The County may then charge against the Contractor the difference between the amount of the Contract award and the amount for which a Contract is subsequently executed, up to the total amount of the Contractor's bid security.

29. EXPENSES INCURRED IN PREPARING BID

All expenses related to a bid are the sole responsibility of the bidder.

30. NEGOTIATIONS WITH LOWEST RESPONSIVE AND RESPONSIBLE BIDDER

If the bid by the lowest responsive and responsible bidder exceeds available funds, the County reserves the right to negotiate with the apparent low bidder to obtain an acceptable price. Negotiations with the apparent low bidder may involve discussions of reduction of quantity, quality, or other cost saving mechanisms. The final negotiated contract shall be subject to final approval of the County, in its sole discretion.

31. ELECTRONIC SIGNATURE

If awarded, the Bidder may be required to accept an agreement and sign electronically through the County's e-signature solution, DocuSign.

FOLLOWING THIS PAGE IS THE AGREEMENT THAT WILL BE ENTERED INTO BETWEEN THE COUNTY AND THE CONTRACTOR. THE AGREEMENT IS PART OF THIS SOLICITATION. THIS AGREEMENT IS SUBJECT TO REVIEW BY THE COUNTY ATTORNEY PRIOR TO BEING SUBMITTED FOR CONTRACTOR'S SIGNATURE.

II. AGREEMENT AND CONTRACT TERMS AND CONDITIONS

ARLINGTON COUNTY, VIRGINIA
OFFICE OF THE PURCHASING AGENT
SUITE 500, 2100 CLARENDON BOULEVARD
ARLINGTON, VA 22201

AGREEMENT NO. 21-CPHD-ITB-271

THIS AGREEMENT is made, on_____, between ____*Contractor's name*___, _____*Contractor's address*___ ("Contractor") a _____*name of state*_____ __*type of entity*__ authorized to do business in the Commonwealth of Virginia, and the County Board of Arlington County, Virginia. The County and the Contractor, for the consideration hereinafter specified, agree as follows:

1. CONTRACT DOCUMENTS

The Contract Documents consist of:

- Agreement No. 21-CPHD-ITB-271, and all modifications properly incorporated into the Agreement
- Exhibit A – Arlington County Invitation to Bid No. 21-CPHD-ITB-271, including DES General Conditions, Special Conditions, and Supplementary Specifications
- Exhibit B – Specifications, Drawings and Construction Notes
- Exhibit C – Price Bid of Contractor

Where the terms and provisions of this Agreement vary from the terms and provisions of the other Contract Documents, the terms and provisions of this Agreement will prevail over the other Contract Documents, and the remaining Contract Documents will be complementary to each other. If there are any conflicts, the most stringent terms or provisions will prevail.

The Contract Documents set forth the entire agreement between the County and the Contractor. The County and the Contractor agree that no representative or agent of either party has made any representation or promise with respect to the parties' agreement that is not contained in the Contract Documents. The Contract Documents may be referred to below as the "Contract" or the "Agreement".

2. SCOPE OF WORK

The Contractor will furnish all labor, materials, and equipment for the construction of street improvement project along N Highland Street from Arlington Blvd to 1st Road N. and includes improvements within the Virginia Department of Transportation (VDOT) right of way at the intersection of N Highland Street and Arlington Boulevard (the "Project") and all other work shown, described, and required by the Contract Documents (hereinafter "the Work").

The Work shall be performed according to the standards established by the Contract Documents read together as a single specification. It shall be the Contractor's responsibility, at solely the Contractor's cost, to provide sufficient services to fulfill the purposes of the Work. Nothing in the Contract Documents shall be construed to limit the Contractor's responsibility to manage the details and execution of its Work.

3. PROJECT OFFICER

The performance of the Contractor is subject to the review and approval of the County Project Officer identified in Section 53, Notices, unless the Contractor is otherwise notified in writing.

4. TIME FOR COMPLETION

Work under this Agreement shall achieve Substantial Completion no later than two-hundred forty (240) consecutive calendar days after the commencement date given in a Notice to Proceed provided by the County to the Contractor, subject to any modifications made as provided for in the Contract Documents. This two-hundred forty (240) day period shall be the Period of Performance for Substantial Completion. No Work shall be deemed Substantially Complete until it meets the requirements of Substantial Completion set forth in the General Conditions. Final Completion of the Work shall be completed no later than ninety (90) calendar days after the date of acceptance of Substantial Completion by the County Project Officer. Work will not reach Final Completion until it meets the requirements set forth in the General Conditions.

5. CONTRACT AMOUNT

The County will pay the Contractor in accordance with the terms of the Progress Payments and Retainage and Payment Terms sections below and at the prices shown in Exhibit D, but not more than $_____ for the Contractor's completion of the Work as required by the Contract Documents provided the Work is performed to the satisfaction of and is accepted by the Project Officer. The Contractor will complete the Work for the total amount specified in this section ("Contract Amount") unless such amount is modified as provided in this Agreement. The Contract Amount includes all of the Contractor's costs and fees (profit) and is inclusive of all anticipated or known site conditions, anticipated or known materials, labor, and equipment costs, or any other costs which should reasonably have been expected by the Contract Documents.

6. PROGRESS PAYMENTS AND RETAINAGE

The County will make monthly progress payments to the Contractor upon written application by the Contractor, on the basis of a written estimate of the work performed during the preceding calendar month as approved by the Project Officer. However, 5% of each progress payment will be retained by the County until Final Completion and acceptance of all Work covered by the Agreement.

All material and work covered by partial payments will become the property solely of the County at the time the partial payment is made. However, the Contractor will have the sole responsibility, care and custody for all materials and work upon which payments have been made until Substantial Completion.

When calculating payment for materials on-site, the County shall not pay for materials which are not scheduled for incorporation into the Work within sixty (60) days from the date of application for payment.

7. PAYMENT TERMS

The Contractor must submit invoices to the County's Project Officer, who will either approve the invoice or require corrections. Each invoice must certify that the invoice submitted is a true and accurate accounting of the work performed and goods and/or services provided and must be signed and attested to by the Contractor or authorized designee. The County will pay the Contractor 45 days after approval of an invoice for completed work which is reasonable and allocable to the Contract. The number of the County Purchase Order pursuant to work has been performed must appear on all invoices.

8. PAYMENT OF SUBCONTRACTORS

The Contractor is obligated to take one of the two following actions within seven days after receipt of payment by the County for work performed by any subcontractor under this Contract:

a. Pay the subcontractor for the proportionate share of the total payment received from the County attributable to the work performed by the subcontractor under this Contract; or

b. Notify the County and the subcontractor, in writing, of the Contractor's intention to withhold all or a part of the subcontractor's payment with the reason for nonpayment.

The Contractor is obligated to pay interest to the subcontractor on all amounts owed by the Contractor to the subcontractor that remain unpaid after seven days following receipt by the Contractor of payment from the County for work performed by the subcontractor under this Contract, except for amounts withheld as allowed in subsection b., above. Unless otherwise provided under the terms of this Contract, interest will accrue at the rate of 1% per month.

The Contractor must include in each of its subcontracts, if any are permitted, a provision requiring each subcontractor to include or otherwise be subject to the same payment and interest requirements with respect to each lower-tier subcontractor.

The Contractor's obligation to pay an interest charge to a subcontractor pursuant to this section may not be construed to be an obligation of the County. A Contract modification may not be made for the purpose of providing reimbursement for such interest charge. A cost reimbursement claim may not include any amount for reimbursement for such interest charge.

9. RELEASE AND REQUEST FOR FINAL PAYMENT

In order to receive final payment upon Final Completion of the Project and before Final Acceptance, the Contractor must submit to the Project Officer a signed original notarized copy of the Arlington County Release and Request for Final Payment form per the General Conditions.

10. LIQUIDATED DAMAGES

Time is of the essence under this Contract. The Work must be completed within the Time for Completion. The County and the Contractor agree that damages for failure to achieve Substantial Completion of the Work by the date specified under Time for Completion are not susceptible to exact determination but that $1,758.00 per calendar day is in proportion to the actual loss that the County would suffer from such delay. Therefore, the Contractor will pay the County as liquidated damages $1,758.00 per day for each and every day beyond the time for Substantial Completion that the County determines Substantial Completion has not achieved. The County and the Contractor also agree that damages for failure to achieve Final Completion of the Work by the date specified under Time for Completion are not susceptible to exact determination but that $1,758.00 per calendar day is in proportion to the actual loss the County would suffer from such delay. Therefore, the Contractor will pay the County as liquidated damages $1758.00 per day for each and every day beyond the time for Final Completion until Final Completion is achieved.

AND

The County will be entitled to deduct liquidated damages against any sums owed by the County to the Contractor under this Contract. The Contractor hereby waives any defense as to the validity of any liquidated damages on grounds that such liquidated damages are void as penalties or are not reasonably related to actual damages.

11. NON-APPROPRIATION

All payments by the County to the Contractor pursuant to this Contract are subject to the availability of an annual appropriation for this purpose by the County Board of Arlington County, Virginia ("Board"). In the event that the Board does not appropriate funds for the goods or services provided under this Contract, the County will terminate the Contract, without termination charge or other liability to the County, on the last day of the fiscal year or when the previous appropriation has been spent, whichever occurs first.

12. COUNTY PURCHASE ORDER REQUIREMENT

County purchases are authorized only if the County issues a Purchase Order in advance of the transaction, indicating that the ordering County agency has sufficient funds available to pay for the purchase. If the Contractor provides goods or services without a signed County Purchase Order, it does so at its own risk and expense. The County will not be liable for payment for any purchases made by its employees that are not authorized by the County Purchasing Agent.

13. LIEN

It is expressly agreed that after any payment has been made by the County either to the Contractor for work done, or labor or material supplied under the Contract, the County will have a lien upon all material delivered to the site either by the Contractor, or for the Contractor, which is to be used in the performance of the Contract.

14. EMPLOYMENT DISCRIMINATION BY CONTRACTOR PROHIBITED

During the performance of its work pursuant to this Contract:

A. The Contractor will not discriminate against any employee or applicant for employment because of race, religion, color, sex, national origin, age or disability or on any other basis prohibited by state law. The Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices setting forth the provisions of this nondiscrimination clause.

B. Notices, advertisements and solicitations placed in accordance with federal law, rule or regulation will be deemed sufficient for meeting the requirements of this section.

C. The Contractor will state in all solicitations or advertisements for employees that it places or causes to be placed that such Contractor is an Equal Opportunity Employer.

D. The Contractor will comply with the provisions of the Americans with Disabilities Act of 1990 ("ADA"), which prohibits discrimination against individuals with disabilities in employment and mandates that disabled individuals be provided access to publicly and privately provided services and activities.

E. The Contractor must include the provisions of the foregoing paragraphs in every subcontract or purchase order of more than $10,000.00 relating to this Contract so that the provisions will be binding upon each subcontractor or vendor.

15. EMPLOYMENT OF UNAUTHORIZED ALIENS PROHIBITED

In accordance with §2.2-4311.1 of the Code of Virginia, as amended, the Contractor must not during the performance of this Contract knowingly employ an unauthorized alien, as that term is defined in the federal Immigration Reform and Control Act of 1986.

16. DRUG-FREE WORKPLACE TO BE MAINTAINED BY CONTRACTOR

During the performance of this Contract, the Contractor must: (i) provide a drug-free workplace for its 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 violating 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 more than $10,000.00 relating to this Contract so that the provisions will be binding upon each subcontractor or vendor.

For the purposes of this section, "workplace" means the site(s) for the performance of the work required by this Contract.

17. *SEXUAL HARRASSMENT POLICY

If the Contractor employs more than five employees, the Contractor shall (i) provide annual training on the Contractor's sexual harassment policy to all supervisors and employees providing services in the Commonwealth, except such supervisors or employees that are required to complete sexual harassment training provided by the Department of Human Resource Management, and (ii) post the Contractor's sexual harassment policy in (a) a conspicuous public place in each building located in the Commonwealth that the Contractor owns or leases for business purposes and (b) the Contractor's employee handbook.

18. PROJECT STAFF

The County has the right to reasonably reject staff or subcontractors whom the Contractor assigns to the Project. The Contractor must then provide replacement staff or subcontractors satisfactory to the County in a timely manner and at no additional cost to the County. The day-to-day supervision and control of the Contractor's employees and its subcontractors is the sole responsibility of the Contractor.

19. FAILURE TO DELIVER

If the Contractor fails to deliver goods or services in accordance with the Contract terms and conditions, the County, after notice to the Contractor, may procure the goods or services from other sources and hold the Contractor responsible for any resulting additional purchase and administrative costs. The County shall be entitled to offset such costs against any sums owed by the County to the Contractor. However, if public necessity requires the use of nonconforming materials or supplies, they may be accepted at a reduction in price to be determined solely by the County.

20. UNSATISFACTORY WORK

If any of the work done, or material, goods, or equipment provided by the Contractor, is unsatisfactory to the County the Contractor must, upon notice from the County, immediately remove at the Contractor's expense such unsatisfactory work, material, goods, or equipment and replace the same with work, material, goods, or equipment satisfactory to the County. If the Contractor fails to do so after fifteen (15) days the County shall have the right to remove or replace the rejected work, material, goods, or equipment at the expense of the Contractor and offset the expense and administrative costs against any sums owed to the Contractor. This provision applies during the Contract term and during any warranty or guarantee period. At the Project Officer's discretion, rather than correction or replacement of the work, an appropriate adjustment to the Contract Amount may be made.

21. TERMINATION

The County may terminate this Contract at any time as follows: (1) for cause, if, as determined by the County, the Contractor is in breach or default or has failed to perform the Work satisfactorily; or (2) for the convenience of the County.

Upon receipt of a notice of termination, the Contractor must not place any further orders or subcontracts for materials, services or facilities; must terminate all vendors and subcontracts, except as are necessary for the completion of any portion of the Work that the County did not terminate; and must immediately deliver all documents related to the terminated Work to the County.

Any purchases that the Contractor makes after the notice of termination will be the sole responsibility of the Contractor, unless the County has approved the purchases in writing as necessary for completion of any portion of the Work that the County did not terminate.

If any court of competent jurisdiction finds a termination for cause by the County to be improper, then the termination will be deemed a termination for convenience.

A. TERMINATION FOR CAUSE, INCLUDING BREACH AND DEFAULT; CURE

1. Termination for Unsatisfactory Performance. If the County determines that the Contractor has failed to perform satisfactorily, then the County will give the Contractor written notice of such failure(s) and the opportunity to cure them within 15 days or any other period specified by the County ("Cure Period"). If the Contractor fails to cure within the Cure Period, the County may terminate the Contract for failure to provide satisfactory performance by providing written notice with a termination date. Upon such termination, the Contractor may apply for compensation for Contract services that the County previously accepted ("Termination Costs"), unless payment is otherwise barred by the Contract. The Contractor must submit any request for Termination Costs, with all supporting documentation, to the County Project Officer within 30 days after the expiration of the Cure Period. The County may accept or reject the request for Termination Costs, in whole or in part, and may notify the Contractor of its decision within a reasonable time.

   In the event of termination by the County for failure to perform satisfactorily, the Contractor must continue to provide its services as previously scheduled through the termination date, and the County must continue to pay all fees and charges incurred through the termination date.

2. Termination for Breach or Default. If the County terminates the Contract for default or breach of any Contract provision or condition, then the termination will be immediate after notice of termination to the Contractor (unless the County provides for an opportunity to cure), and the Contractor will not be permitted to seek Termination Costs.

   Upon any termination pursuant to this section, the Contractor will be liable to the County for costs that the County must expend to complete the Work, including costs resulting from any related delays and from unsatisfactory or non-compliant work performed by the Contractor or its subcontractors. The County will deduct such costs from any amount due to the Contractor; or if the County does not owe the Contractor, the Contractor must promptly pay the costs within 15 days of a demand by the County. This section does not limit the County's recovery of any other damages to which it is entitled by law.

   Except as otherwise directed by the County, the Contractor must stop work on the date of receipt the notice of the termination.

B. TERMINATION FOR THE CONVENIENCE OF THE COUNTY

The County may terminate this Contract in whole or in part whenever the Purchasing Agent determines that termination is in the County's best interest. The County will give the Contractor at least 15 days' notice in writing. The notice must specify the extent to which the Contract is terminated and the effective termination date. The Contractor will be entitled to Termination Costs, as defined above, plus any other reasonable amounts that the parties might negotiate; but no amount will be allowed for anticipatory profits.

Except as otherwise directed by the County, the Contractor must stop work on the date of receipt of the notice of the termination.

22. INDEMNIFICATION

The Contractor covenants for itself, its employees and its subcontractors to save, defend, hold harmless and indemnify the County and all of its elected and appointed officials, officers, current and former employees, agents, departments, agencies, boards and commissions (collectively the "County Indemnitees") from and against any and all claims made by third parties for any and all losses, damages, injuries, fines, penalties, costs (including court costs and attorneys' fees), charges, liability, demands or exposure resulting from, arising out of or in any way connected with the Contractor's acts or omissions, including the acts or omissions of its employees, vendors, delivery drivers and/or subcontractors, in performance or nonperformance of the Contract. This duty to save, defend, hold harmless and indemnify will survive the termination of this Contract. If the Contractor fails or refuses to fulfill its obligations contained in this section, the Contractor must reimburse the County for any and all resulting payments and expenses, including reasonable attorneys' fees. The Contractor must pay such expenses upon demand by the County, and failure to do so may result in the County withholding such amounts from any payments to the Contractor under this Contract.

23. INTELLECTUAL PROPERTY INDEMNIFICATION

The Contractor warrants and guarantees that in providing services under this Contract neither the Contractor nor any subcontractor is infringing on the intellectual property rights (including, but not limited to, copyright, patent, mask and trademark) of third parties.

If the Contractor or any of its employees or subcontractors uses any design, device, work or material that is covered by patent or copyright, it is understood that the Contract Amount includes all royalties, licensing fees, and any other costs arising from such use in connection with the Work under this Contract.
The Contractor covenants for itself, its employees and its subcontractors to save, defend, hold harmless, and indemnify the County Indemnitees, as defined above, from and against any and all claims, losses, damages, injuries, fines, penalties, costs (including court costs and attorneys' fees), charges, liability or exposure for infringement of or on account of any trademark, copyright, patented or unpatented invention, process or article manufactured or used in the performance of this Contract. This duty to save, defend, hold harmless and indemnify will survive the termination of this Contract. If the Contractor fails or refuses to fulfill its obligations contained in this section, the Contractor must reimburse the County for any and all resulting payments and expenses, including reasonable attorneys' fees. The Contractor must pay such expenses upon demand by the County, and failure to do so may result in the County withholding such amounts from any payments to the Contractor under this Contract.

24. COPYRIGHT

By this Contract, the Contractor irrevocably transfers, assigns, sets over and conveys to the County all rights, title and interest, including the sole exclusive and complete copyright interest, in any and all copyrightable works created pursuant to this Contract. The Contractor will execute any documents that the County requests to formalize such transfer or assignment.

The rights granted to the County by this section are irrevocable and may not be rescinded or modified, including in connection with or as a result of the termination of or a dispute concerning this Contract.

The Contractor may not use subcontractors or third parties to develop or provide input into any copyrightable materials produced pursuant to this Contract without the County's advance written approval and unless the Contractor includes this Copyright provision in any contract or agreement with such subcontractors or third parties related to this Contract.

25. OWNERSHIP AND RETURN OF RECORDS

This Contract does not confer on the Contractor any ownership rights or rights to use or disclose the County's data or inputs.

All drawings, specifications, blueprints, data, information, findings, memoranda, correspondence, documents or records of any type, whether written, oral or electronic, and all documents generated by the Contractor or its subcontractors as a result of this Contract (collectively "Records") are the exclusive property of the County and must be provided or returned to the County upon completion, termination, or cancellation of this Contract. The Contractor will not use or willingly cause or allow such materials to be used for any purpose other than performance of this Contract without the written consent of the County.
The Records are confidential, and the Contractor will neither release the Records nor share their contents. The Contractor will refer all inquiries regarding the status of any Record to the Project Officer or to his or

her designee. At the County's request, the Contractor will deliver all Records, including hard copies of electronic records, to the Project Officer and will destroy all electronic Records.

The Contractor agrees to include the provisions of this section as part of any contract or agreement related to this Contract into which it enters with subcontractors or other third parties.

The provisions of this section will survive any termination or cancellation of this Contract.

26. CONFIDENTIAL INFORMATION

The Contractor and its employees, agents and subcontractors will hold as confidential all County information obtained under this Contract. Confidential information includes, but is not limited to, nonpublic personal information; personal health information (PHI); social security numbers; addresses; dates of birth; other contact information or medical information about a person; and information pertaining to products, operations, systems, customers, prospective customers, techniques, intentions, processes, plans and expertise. The Contractor must take reasonable measures to ensure that all of its employees, agents and subcontractors are informed of and abide by this requirement.

27. ETHICS IN PUBLIC CONTRACTING

This Contract incorporates by reference Article 9 of the Arlington County Purchasing Resolution, as well as all state and federal laws related to ethics, conflicts of interest or bribery, including the State and Local Government Conflict of Interests Act (Code of Virginia § 2.2-3100 et seq.), the Virginia Governmental Frauds Act (Code of Virginia § 18.2-498.1 et seq.) and Articles 2 and 3 of Chapter 10 of Title 18.2 of the Code of Virginia, as amended (§ 18.2-438 et seq.). The Contractor certifies that its bid was made without collusion or fraud; that it has not offered or received any kickbacks or inducements from any other offeror, supplier, manufacturer or subcontractor; and that it has not conferred on any public employee having official responsibility for this procurement 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.

28. COUNTY EMPLOYEES

No Arlington County employee may share in any part of this Contract or receive any benefit from the Contract that is not available to the general public.

29. FORCE MAJEURE

Neither party will be held responsible for failure to perform the duties and responsibilities imposed by this Contract if such failure is due to a fire, riot, rebellion, natural disaster, war, act of terrorism or act of God that is beyond the control of the party and that makes performance impossible or illegal, unless otherwise specified in the Contract.

30. AUTHORITY TO TRANSACT BUSINESS

The Contractor must, pursuant to Code of Virginia § 2.2-4311.2, be and remain authorized to transact business in the Commonwealth of Virginia during the entire term of this Contract. Otherwise, the Contract is voidable at the sole option of and with no expense to the County.

31. RELATION TO THE COUNTY

The Contractor is an independent contractor, and neither the Contractor nor its employees or subcontractors will be considered employees, servants or agents of the County. The County will not be responsible for any negligence or other wrongdoing by the Contractor or its employees, servants or agents. The County will not withhold payments to the Contractor for any federal or state unemployment taxes, federal or state income taxes or Social Security tax or for any other benefits. The County will not provide to the Contractor any insurance coverage or other benefits, including workers' compensation.

32. ANTITRUST

The Contractor conveys, sells, assigns and transfers to the County all rights, title and interest in and to all causes of action under state or federal antitrust laws that the Contractor may have relating to this Contract.

33. REPORT STANDARDS

The Contractor must submit all written reports required by this Contract for advance review in a format approved by the Project Officer. Reports must be accurate and grammatically correct and should not contain spelling errors. The Contractor will bear the cost of correcting grammatical or spelling errors and inaccurate report data and of other revisions that are required to bring the report(s) into compliance with this section.

Whenever possible, proposals must comply with the following guidelines:

- printed double-sided on at least 30% recycled-content and/or tree-free paper
- recyclable and/or easily removable covers or binders made from recycled materials (proposals with glued bindings that meet all other requirements are acceptable)
- avoid use of plastic covers or dividers
- avoid unnecessary attachments or documents or superfluous use of paper (e.g. separate title sheets or chapter dividers)

34. AUDIT

The Contractor must retain all books, records and other documents related to this Contract for at least five years, or such period of time required by the County's funding partner(s), if any, whichever is greater, after the final payment and must allow the County or its authorized agents to examine the documents during this period and during the Contract Term. The Contractor must provide any requested documents to the County for examination within 15 days of the request, at the Contractor's expense. Should the County's examination reveal any overcharging by the Contractor, the Contractor must, within 30 days of County's request, reimburse the County for the overcharges and for the reasonable costs of the County's examination, including, but not limited to, the services of external audit firm and attorney's fees; or the County may deduct the overcharges and examination costs from any amount that the County owes to the Contractor. If the Contractor wishes to destroy or dispose of any records related to this Contract (including confidential records to which the County does not have ready access) within five years after the final payment, or such period of time required by the County's funding partner(s), if any, whichever is greater, the Contractor must give the County at least 30 days' notice and must not dispose of the documents if the County objects.

35. ASSIGNMENT

The Contractor may not assign, transfer, convey or otherwise dispose of any award or any of its rights, obligations or interests under this Contract without the prior written consent of the County.

36. AMENDMENTS

This Contract may not be modified except by written amendment executed by persons duly authorized to bind the Contractor and the County.

37. ARLINGTON COUNTY PURCHASING RESOLUTION AND COUNTY POLICIES

Nothing in this Contract waives any provision of the Arlington County Purchasing Resolution, which is incorporated herein by reference, or any applicable County policy.

38. DISPUTE RESOLUTION

All disputes arising under this Agreement or concerning its interpretation, whether involving law or fact and including but not limited to claims for additional work, compensation or time, and all claims for alleged breach of contract must be submitted in writing to the Project Officer as soon as the basis for the claim arises. In accordance with the Arlington County Purchasing Resolution, claims denied by the Project Officer may be submitted to the County Manager in writing no later than 60 days after the final payment. The time limit for a final written decision by the County Manager is 30 days. Procedures concerning contractual claims, disputes, administrative appeals and protests are contained in the Arlington County Purchasing Resolution. The Contractor must continue to work as scheduled pending a decision of the Project Officer, County Manager, County Board or a court of law.

39. APPLICABLE LAW, FORUM, VENUE, AND JURISDICTION

This Contract is governed in all respects by the laws of the Commonwealth of Virginia; and the jurisdiction, forum and venue for any litigation concerning the Contract or the Work is in the Circuit Court for Arlington County, Virginia, and in no other court.

40. ARBITRATION

No claim arising under or related to this Contract may be subject to arbitration.

41. NONEXCLUSIVITY OF REMEDIES

All remedies available to the County under this Contract are cumulative, and no remedy will be exclusive of any other at law or in equity.

42. NO WAIVER

The failure to exercise a right provided for in this Contract will not be a subsequent waiver of the same right or of any other right.

43. SEVERABILITY

The sections, paragraphs, clauses, sentences, and phrases of this Contract are severable; and if any section, paragraph, clause, sentence or phrase of this Contract is declared invalid by a court of competent jurisdiction, the rest of the Contract will remain in effect.

44. ATTORNEY'S FEES

In the event that the County prevails in any legal action or proceeding brought by the County to enforce any provision of this Contract, the Contractor will pay the County's reasonable attorney's fees and expenses.

45. SURVIVAL OF TERMS

In addition to any statement that a specific term or paragraph survives the expiration or termination of this Contract, the following sections also survive: INDEMNIFICATION; INTELLECTUAL PROPERTY INDEMNIFICATION; RELATION TO COUNTY; OWNERSHIP AND RETURN OF RECORDS; AUDIT; COPYRIGHT; DISPUTE RESOLUTION; APPLICABLE LAW AND JURISDICTION; ATTORNEY'S FEES, AND CONFIDENTIAL INFORMATION.

46. HEADINGS

The section headings in this Contract are inserted only for convenience and do not affect the substance of the Contract or limit the sections' scope.

47. AMBIGUITIES

The parties and their counsel have participated fully in the drafting of this Agreement; and any rule that ambiguities are to be resolved against the drafting party does not apply. The language in this Agreement is to be interpreted as to its plain meaning and not strictly for or against any party.

48. NOTICES

Unless otherwise provided in writing, all legal notices and other formal communications required by this Contract are deemed to have been given when either (a) delivered in person; (b) delivered by an agent, such as a delivery service; or (c) deposited in the United States mail, postage prepaid, certified or registered and addressed as follows:

TO THE CONTRACTOR:

_____
_____
_____
_____

TO THE COUNTY:

_____, Project Officer
_____
_____
_____

AND

Sharon T. Lewis, LL.M, MPS, VCO, CPPB
Purchasing Agent
Arlington County, Virginia
2100 Clarendon Boulevard, Suite 500

Arlington, Virginia 22201

TO COUNTY MANAGER'S OFFICE (FOR PROJECT CLAIMS):

Mark Schwartz, County Manager
Arlington County, Virginia
2100 Clarendon Boulevard, Suite 318
Arlington, Virginia 22201

49. NON-DISCRIMINATION NOTICE

Arlington County does not discriminate against faith-based organizations.

50. INSURANCE, PAYMENT AND PERFORMANCE BONDS

The Contractor shall maintain the required insurance coverage and payment and performance bonds as set forth in the Invitation to Bid through completion of the Contract, including all warranty and guarantee periods.

51. MATERIAL CHANGES

The Contractor shall notify Purchasing Agent within seven days of any material changes in its operation that relate to any matter attested regarding certifications on its bid form.

60. COUNTERPARTS

This Agreement may be executed in one or more counterparts and all of such counterparts shall together constitute one and the same instrument. Original signatures transmitted and received via facsimile or other electronic transmission (e.g., PDF or similar format) are true and valid signatures for all purposes hereunder and shall be effective as delivery of a manually executed original counterpart.

WITNESS these signatures:

THE COUNTY BOARD OF ARLINGTON COUNTY, VIRGINIA	CONTRACTOR
AUTHORIZED SIGNATURE: _____	AUTHORIZED SIGNATURE: _____
NAME: __SY GEZACHEW_____	NAME: _____
TITLE: ___PROCUREMENT OFFICER_____	TITLE: _____
DATE:_____	DATE: _____

III. ARLINGTON COUNTY CONSTRUCTION GENERAL CONDITIONS

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A. INTRODUCTION TO TERMS

1) The term "Agreement" means the completed and signed Form of Contract Agreement.

2) The term “Award Date” means the date of execution of the Agreement by the Purchasing Agent.

3) The term “Business Day” shall refer to any day that the County is open for general business.

4) The term “Calendar Day” means any day of twenty-four hours measured from midnight to the next midnight. Included are weekends and holidays. When the term “Day” is used it shall be assumed to refer to a Calendar Day unless otherwise specified.

5) The term “Change Order” means a written order to the Contractor, signed by the Project Officer and the Contractor, which authorizes a change in the Work, and/or adjustment to the Contract Amount and/or an adjustment to the Time for Completion. A Change Order once signed by all the parties is incorporated into and becomes part of the Contract.

6) The term "Commencement Date" means the date on which the Time for Completion will commence for the Contractor to begin to perform his obligations under the Contract Documents as provided in the Notice to Proceed.

7) The term “Construction Change Directive” means a written order issued by the County directing a change in the Work prior to agreement on adjustment, if any, in the Contract Amount or Contract Time, or both.

8) The term "Contract Documents" means the Agreement and all the documents and Exhibits and/or Attachments identified therein which shall include the Drawings and the Specifications, and all modifications including amendments and subsequent Change Orders thereto properly incorporated in the Contract.

9) The terms "County" and "Contractor" shall mean the respective parties to the Contract. They shall be treated throughout the Contract Documents as though each were of the singular number and masculine gender. Only one Contractor is recognized as a party to this Contract.

10) The term “Critical Path Method or CPM” means a step-by-step project management technique for process planning that defines critical and non-critical tasks with the goal of preventing time-frame problems and process bottlenecks. An activity on the critical path cannot be started until its predecessor activity has been completed.is delayed then the entire project is delayed.

11) The term “Delay” means an event or condition that results in a work activity starting or being completed later than originally planned.

12) The term "Drawings" means all drawings pertaining to the Contract, including the Contract Drawings and Construction Notes which show and describe the locations, character, dimensions, and details of the Work to be performed under the contract.

13) The term “Final Acceptance” shall mean the date on which the County issues the final payment for the Work.

14) The term “Final Completion” shall mean the condition when the County agrees that all the Work has been fully completed in accordance with the Contract Documents and is acceptable. The date of the Final Completion of the Work under the Contract is the date on which Final Completion is accomplished.

15) The term “Float” shall represent the amount of time that a task in a project network or sequence can be delayed without causing a delay to: subsequent tasks ("free float") or project completion date ("total float"). Float shall belong to the County and shall be used for the successful completion of the Project within the Time for Completion.

16) The term “Notice to Proceed” shall mean a written notice issued by the County to the Contractor stating the Commencement Date. The Notice to Proceed will specify the Time for Completion of the Contract.

17) The term “Project” means the entire proposed construction to be executed as stipulated in the Contract Documents

18) The term "Project Officer" means the County Project Officer assigned by the Director of the County Department responsible for the project, or the Director’s designee. When a designee to act on behalf of the Project Officer is used by the County, the name of the designee and the duties and authority of such designee will be identified in the Contract Documents or in a written notice to the Contractor from the Project Officer responsible for the project. The designee may be a professional architect or engineer or other person employed by the County to perform construction services administration, design services, or project oversight.

19) The term “Punch List” means unfinished items of the construction of the Project, which unfinished items of construction are minor or insubstantial details of construction, mechanical adjustment or decoration remaining to be performed, the non-completion of which would not materially affect use of the Project, and which are capable of being completed within the time specified for Final Completion after Substantial Completion has been achieved.

20) The term “Request for Information” (RFI) means a request originated by the Contractor requesting clarification or additional information from the Project Officer and/or Architect/Engineer concerning information in the construction documents where the Contractor believes there is insufficient information or a conflict in the documents. RFI’s shall be submitted by the Contractor sufficiently in advance of the Work to provide time for assessment and response without delay of the Work. Reponses to RFI’s shall not be construed as authorization for a Change Order.

21) The term “Schedule of Values” means a listing of the Contractor’s total contract value by Construction Specifications Institute (CSI) divisions, including Division 1, Contractor’s General Conditions.

22) The term “Site” refers to that portion of the property on which the Work is to be performed or which has otherwise been set aside for use by the Contractor.

23) The terms "Special Conditions" mean the written statements modifying or supplementing the Technical Specifications or General Conditions for requirements or conditions peculiar to the Contract.

24) The term "Specifications" means and shall include the Technical Specifications, the Special Conditions and all written agreements and instructions pertaining to the performance of the Work.

25) When used, the term “Stipulated Price Item” means and includes an item of Work, unanticipated or of unknown quantity at the time of issuance of the solicitation for a Bid and determined to be executed, based on the actual field conditions during the progress of Work under the Contract. The Unit Price for the “Stipulated Price Item”, as identified in the “Stipulated Price Items” section of the Bid Form, is predetermined by the County as the current reasonably workable rate for the Item inclusive of all necessary labor, equipment, materials, overheads (provision and installation), and the contractor’s profit.

26) The term "Subcontractor", shall include only those having a direct contract with the Contractor, and it shall include those who furnish material worked to a special design according to the plans and specifications for this Work but shall not include those who merely furnish material not so worked.

27) The term “Substantial Completion” shall mean the condition when the County agrees that the Work, or a specific portion thereof, is sufficiently complete, in accordance with the Contract Documents, so that it can be utilized by the County for the purposes for which it was intended. The date of Substantial Completion of the Work under the Contract is the milestone date on which Substantial Completion condition is accomplished.

28) The term "Technical Specifications" means that part of the Contract Documents that describe the quality of materials, method of installation, standard of workmanship, and the administrative and procedural requirements for the performance of the Work under the contract.

29) The term “Time for Completion” shall mean the time period set forth in the Agreement.

30) The term "Work" shall mean the services performed under this Contract including, but not limited to, furnishing labor, and furnishing and installing materials and equipment required to complete the Project specified in the Contract Documents.

B. DRAWINGS, SPECIFICATIONS, RELATED DATA AND RECORDS KEEPING

1. INTENT OF THE DRAWINGS AND SPECIFICATIONS

a. It is understood that, except as otherwise specifically stated in the Contract Documents, the Contractor shall provide and pay for all materials, labor, tools, equipment, water, water haulage, light power, transportation, superintendence, temporary construction of

all kinds, and other services and facilities of every nature whatsoever that are necessary to execute and deliver the Work, complete and usable within the scope of the Contract with all parts in working order, and all connections properly made.

b. The general character and scope of the Work are illustrated by the Drawings and listed in the Specifications. Any additional drawings and or other instructions deemed necessary by the Project Officer or designee will be furnished to the Contractor when required for the Work and shall be incorporated into the Contract Documents.

c. Where “as shown”, “as indicated”, “as detailed”, or words of similar import are used, it shall be understood that direction, requirements, permission, or review of Project Officer or designee is intended unless stated otherwise. As used herein, “provide” shall be understood to mean “provide complete in place”, that is, “furnish and install.”

d. Unless otherwise specifically noted, the word "similar" where it occurs in the Drawings, shall be interpreted in its general sense and not as meaning identical, and all details shall be worked out in relation to their locations and their connection with other parts of the Work.

e. Materials or work described in words which, so applied, have a well-known technical, construction industry, or trade meaning, shall be held to refer to the recognized technical or trade meaning.

f. The Contract Documents are complementary, and what is called for by any one document shall be as binding as if called for by all documents. In case of conflicting variance between the Contract Documents, the Order of Precedence stated in the Agreement shall govern. Figured dimensions on the plans shall be used; drawings shall not be scaled.

2. <u>DISCREPANCIES AND ERRORS</u>

If the Contractor discovers any discrepancies between the Drawings and Specifications and the site conditions or any errors or omissions in the Drawings or Specifications, the Contractor shall at once, but in no event later than three calendar days after discovery of the discrepancy or error, report them in writing to the Project Officer or designee. If the Contractor proceeds with any work that may be affected by such discrepancies, errors, or omissions, after their discovery, but before a clarification is provided, such work shall be at the Contractor's risk and expense. Issues affecting critical path activities shall be made known to the Project Officer or designee within one business day after discovery.

3. <u>DIFFERING SITE CONDITIONS</u>

The Contractor shall immediately, and before the conditions are further disturbed, give notice to the Project Officer of subsurface or latent physical conditions at the site which differ materially from those indicated in this Contract, or previously unknown physical conditions discovered at the site of an unusual nature and which differ materially from those ordinarily expected to be encountered at the site. Such notice shall be followed by a written notice provided within 48 hours of discovery.

The Project Officer will investigate the site conditions promptly after receiving the notice. If the conditions do materially differ to the extent that an increase or decrease would result in the Contractor's cost of the Work, or the time required for performing any part of the Work under the contract, an equitable adjustment may be made under this clause and the Contract modified in writing accordingly.

No request by the Contractor for an adjustment to the Contract under this clause shall be allowed, unless the Contractor has given the written notice required. If the Contractor proceeds with any work that may be affected by such differing site conditions before giving notice to the Project Officer as set forth herein, such work shall be at the Contractor's sole risk and expense.

No request by the Contractor for an adjustment to the contract for differing site conditions shall be allowed if made after Final Payment under the Contract.

4. COPIES FURNISHED

Except as provided for otherwise, copies of the Drawings and Specifications reasonably necessary for the execution of the Work will be furnished to the Contractor. One electronic copy of the Contract Drawings and Specifications will be provided by the Project Officer or designee to the Contractor.

5. USE OF CADD FILES

The Contractor may request Electronic CADD files related to the Work or the Project. The CADD files will be provided by the County only if the Contractor completes the Arlington County Electronic CADD Drawing Release Form, which form is then incorporated by reference into this Contract. Use of CADD files is at the Contractor's own risk and in no way alleviates Contractor's responsibility for the Work to conform to the Plans and Specifications.

6. DOCUMENTS ON THE JOBSITE

The Contractor shall keep on the site of the Project a copy of the Drawings and Specifications updated to include all authorized revisions and RFI responses and shall at all times give the County and its authorized representatives access thereto. The Contractor shall mark up the Drawings on a daily basis in red. The drawings shall be submitted to the County at Substantial Completion as the Record marked up set.

7. OWNERSHIP OF DRAWINGS AND SPECIFICATIONS

All Drawings and Specifications and copies thereof furnished by the County are the property of the County and shall not be used on other projects. All copies of the Drawings and Specifications except the signed Contract sets shall be returned to the Project Officer or designee at Final Completion.

8. SUBMITTALS

a. The term "submittals", as used herein, shall include fabrications, erection and setting drawings, manufacturers' standard drawings, schedules, descriptive literature, catalogs, brochures, performance and test data, wiring and control diagrams, and other

descriptive data pertaining to the materials and equipment as required to demonstrate compliance with the Contract requirements.

b. Unless other specified in the Specifications the Contractor shall submit for the review of the Project Officer or designee a listing of all submittals required by the Specifications or requested by the Project Officer or designee within fifteen (15) calendar days after receipt of the Notice to Proceed. This listing shall include due dates for each required submittal, coordinated with the project schedule such that adequate time is allotted for review and potential resubmittals, fabrication and delivery without causing delay. The Contractor bears all risk for delay associated with submittals not received in a timely manner.

c. Submittals shall be submitted in such number of copies as established in the Specifications. Each submission shall be accompanied by a letter of transmittal, listing the contents of the submission and identifying each item by reference to specification section or drawing. All submittals shall be clearly labeled with the name of the project and such information as may be necessary to enable their complete review by the Project Officer or designee. Catalog plates and other similar material that cannot be so labeled conveniently shall be bound in suitable covers bearing the identifying data.

d. Submittals shall be accompanied by all required certifications and other such supporting material and shall be submitted in sequence or groups that all related items can be checked together. When submittals cannot be checked because a submission is not complete, or because submittals on related items have not been received by the Project Officer or designee, then such submittals will be returned without action or will be held, not checked, until the missing material is received. Incomplete or defective submittals shall not be considered to have been submitted. Failure to deliver submittals within the specified time will not be grounds for additional time or compensation.

e. Submittals shall have been reviewed by the Contractor and coordinated with all other related or affected work before they are submitted for review and acceptance and shall bear the Contractor's certification that the Contractor has checked and approved them as complying with all relevant information in the Contract Documents. Submittals submitted without such certification and coordination will be returned to the Contractor without action and will not be considered as a formal submission.

f. If shop drawings show variations from the Drawings and Specifications because of standard shop practice or other reasons, the Contractor shall make specific mention of such variation in the Contractor's letter of transmittal in order that, if acceptable, suitable action may be taken for proper adjustment; otherwise the Contractor will not be relieved of the responsibility for executing the work in accordance with the Drawings and Specifications even though shop drawings have been accepted.

g. The Project Officer or designee shall review the shop drawings with reasonable promptness. Review and/or acceptance of shop drawings will be general for conformance with the design concept of the Project and compliance with the information given in the Contract Documents, and will not include quantities, detailed

dimensions, nor adjustments of dimensions to actual field conditions. Acceptance shall not be construed as permitting any departure from Contract requirements, as authorization of any increase in price nor as relieving the Contractor of the responsibility for any error in details, dimensions or otherwise that may exist. Review is not intended to relieve the contractor of full responsibility for the accuracy and completeness of the plans and calculations, or for the complete compliance with the contract documents. Contractor is solely responsible for the means and methods of the construction, including temporary items proposed for use.

9. SAMPLES

The Contractor shall submit to the Project Officer or designee, all samples required by the Specifications or requested by the Project Officer or designee. Samples shall be submitted in single units only, unless the Contractor desires additional units for the Contractor's own use. Each sample shall bear a label indicating what the material represented, the name of the producer and the title of the Project. Acceptance of a sample shall be only for conformance with the design concept of the Project and compliance with the information given in the Contract Documents, and only for the characteristics or use named in such acceptance. Such acceptance shall not be construed to change or modify any Contract requirements or the Contract Price. Materials and equipment incorporated in the Work shall match the accepted samples. The Contractor shall be responsible for researching the availability of the specified product in the dimensions and colors specified at no additional cost to the County. Failure of the Contractor to identify specified products that are not commercially produced within the time required for submittal transmittal in order to meet the project schedule shall not be entitled to additional time or compensation.

10. TESTS

Any specified tests of materials and finished articles shall be made by bureaus, laboratories or agencies approved by the Project Officer or designee and the certified reports of such tests shall be submitted to the Project Officer or designee. All tests shall be in compliance with the Specifications. All costs in connection with the testing and test failures shall be borne by the Contractor. Failure of any material to pass the specified tests or any test performed by the Project Officer or designee, will be sufficient cause for refusal to consider, under this Contract, any further materials of the same brand or make of that material. Samples of various materials delivered on the site or in place may be taken by the Project Officer or designee for testing. Samples failing to meet the Contract requirements will automatically void previous acceptance of the items tested. The Contractor will not be compensated for additional time and/or cost incurred in finding an acceptable replacement or the removal and replacement of the defective item.

11. MATERIALS AND EQUIPMENT LIST

a. Unless otherwise specified in the Specifications, within thirty (30) days of the Commencement Date the Contractor shall submit to the Project Officer or designee a complete list of materials and equipment proposed for use in connection with the Project. Partial lists submitted from time to time will not be considered unless specifically approved by the Project Officer or designee.

b. After any material or piece of equipment has been approved through submittal process, no change in brand or make will be permitted unless satisfactory written evidence is presented to prove that the manufacturer cannot make scheduled delivery of the accepted material, or that material delivered has been rejected and the substitution of a suitable material is an urgent necessity, or that other conditions have become apparent which indicate that acceptance of such other material is in the best interest of the County. The Contractor is solely responsible for the cost and time required to obtain and install a suitable replacement.

12. STANDARDS, SUBSTITUTIONS

a. Any material specified by reference to the number, symbol or title of a specific standard, such as a Commercial Standard, a Federal Specification, a Trade Association Standard, or other similar standard, shall comply with the requirements in the latest revision of the standards or specification and any amendment or supplement, except as limited to type, class or grade, or as modified in such reference. The standard referred to, except as modified in the Specifications, shall have full force and effect as though printed in the Specifications.

b. Reference in the Specifications or on the Drawings to any article, device, product, material, fixture, form or type of construction by name, make or catalog number shall be interpreted as establishing a standard of quality and shall not be construed as eliminating from competition other products of equal or better quality by other approved manufacturers. Otherwise, applications for acceptance of substitutions for the specified items will be considered only upon request of the Contractor, not of individuals, trades or suppliers, and only for a specific purpose; no blanket acceptance will be granted. No acceptance of a substitution shall be valid unless it is in written form and signed by the Project Officer or designee.

c. If any proposed substitution will affect a correlated function, adjacent construction or the work of other contractors, then the necessary changes and modifications to the affected work shall be considered as an essential part of the proposed substitution, to be accomplished by the Contractor without additional expense to the County or an extension of the contract time, if and when accepted. Detail drawings and other information necessary to show and explain the proposed modifications shall be submitted with the request for acceptance of the substitution.

13. SURVEYS AND CONTROLS

Unless otherwise specified, the Contractor shall establish all baselines for the location of the principal component parts of the Work, establish a suitable number of benchmarks adjacent to the Work, and develop all detail surveys necessary for construction by a professional land surveyor licensed in the Commonwealth of Virginia. The Contractor shall carefully preserve benchmarks, reference points and stakes, and in the case of destruction thereof by the Contractor or due to the Contractor's negligence or the negligence of any subcontractor or supplier, the Contractor shall be responsible for expense and damage resulting therefrom and shall be responsible for any mistakes that may be caused by the loss or disturbance of such benchmarks, reference points and stakes. The Contractor shall within 30 days of NTP perform a full site survey to verify all control points shown on the drawings against existing conditions

within the site limits. Any discrepancies found during this effort shall be made known immediately to the Project Officer. Failure to perform this survey and provide proof and acceptance of Project datum, control points, and existing benchmarks will not give rise to any extensions to contract time or amount. The cost of all necessary surveying services shall be considered incidental to the work and, unless otherwise specified, shall be included in the cost of the Work.

14. RECORD DRAWINGS

Record drawings shall be the responsibility of the Contractor. The Contractor shall maintain and mark up one set of prints of the applicable Contract Drawings to portray record construction. The prints shall be neatly and clearly marked in red to show all variations between the Work actually provided and that indicated on the Contract Drawings, and all utilities encountered in the Work. All drafting shall conform to good drafting practice and shall include such supplementary notes, legends and details as may be necessary for legibility and clear portrayal of the record construction. These drawings shall be marked promptly upon any approved change to the Work or discovery of any undocumented utility or obstruction and shall be submitted to the Project Officer or designee in sufficient time to be approved no later than thirty (30) calendar days after the Substantial Completion Date. The final record drawings approved by the Project Officer or designee shall be submitted in paper copy and .pdf format electronic files prior to Final Completion. Unless otherwise required under the Contract Documents, incorporation of red-lined changes into CADD format shall be the responsibility of the Architect and/or Engineer of Record, with the exception being any documents prepared by the Contractor in CADD, the record version of which shall also be provided to the County in CADD format by the Contractor. Final payments will be held until the complete set of red-line drawings are submitted to and approved by the Project Officer.

C. COUNTY, COUNTY PROJECT OFFICER, AND CONTRACTOR RELATIONS

1. STATUS OF COUNTY PROJECT OFFICER OR DESIGNEE

The Project Officer or designee shall be the County's representative during the construction period. All Contractor instructions or requests shall be issued from or submitted through the Project Officer or designee. The Project Officer or designee shall have authority to suspend the Work whenever such suspension may be necessary in the responsible opinion of the Project Officer or designee to ensure the proper execution of the Contract. The Project Officer or designee shall also have authority to reject all work and materials that do not conform to the Contract and to decide questions that arise in the execution of the Work. The County Project Officer or designee will, within a reasonable time, make decisions on all matters relating to the execution and progress of the Work.

2. LIMITATION ON COUNTY'S RESPONSIBILITIES

The County shall not supervise, direct, or have control or authority over, nor be responsible for: The Contractor's means, methods, techniques, sequences or procedures of construction; the safety precautions and programs related to safety, or the Contractor's failure to perform or furnish the Work in accordance with the Contract Documents.

3. DISPUTES

a. All disputes or claims arising under this Contract or its interpretation, whether involving law or fact or both, or extra work, and all claims for alleged breach of Contract shall be submitted in writing to the Project Officer or designee as set forth in these General Conditions. Such claims must set forth in detail the amount of the claim and shall state the facts surrounding it in sufficient detail to identify it together with its character and scope.

b. Claims denied by the Project Officer shall be processed in accordance with the procedures outlined in Sections 7-107, Contractual Disputes and 7-108, Legal Actions of the Arlington County Purchasing Resolution and the Dispute Resolution paragraph in the Agreement.

c. The Contractor shall not cause a delay in the work pending a decision of the Project Officer or designee, County Manager, County Board, or court, except by prior written approval of the Project Officer or designee.

4. INSPECTION OF WORK

The Project Officer or designee and representatives of any public authority having jurisdiction shall, at all times, have access to the Work while in progress. The Contractor shall provide suitable facilities for such access and for proper observation of the Work and shall conduct all special tests required by the Specifications, the Project Officer or designee's instructions, and any laws, ordinances or the regulations of any public authority applicable to the work. Nothing in this section shall abrogate or otherwise limits or relieves the Contractor's independent duty to inspect the Work.

5. INSPECTION OF MATERIALS

All articles, materials, and supplies purchased by the Contractor for the Work are subject to inspection upon delivery to the site and during manufacturing or fabrication The County reserves the right to return for full credit, at the risk and expense of the Contractor, all or part of the articles, materials, or supplies furnished contrary to Specifications and instructions. Nothing in this section shall abrogate or otherwise limit or relieve the Contractor's independent duty to inspect materials.

6. EXAMINATION OF COMPLETED WORK

If the Project Officer or designee requests it, the Contractor, at any time before acceptance of the Work, shall remove or uncover such portions of the finished work as may be directed. After examination, the Contractor shall restore said portions of the work to the standard required by the Specifications. Should the work thus exposed or examined prove acceptable, then the uncovering or removing, and the replacing of the covering or making good of the parts removed shall be paid for as extra work but should the work so exposed or examined prove unacceptable, then the uncovering, removing and replacing shall be at the Contractor's expense.

7. RIGHT TO SUSPEND WORK

The County shall have the authority to suspend the Work, in whole or in part, for such periods and such reasons as the County may deem necessary or desirable. Any such suspension shall be in writing to the Contractor and the Contractor shall obey such order immediately and not resume the Work until so ordered in writing by the County. No such suspension of the Work shall be the basis for a claim by the Contractor for any increase in the Contract Amount provided that the suspension is for a reasonable time under the circumstances then existing. If the suspension of Work is caused by the County's belief that non-conforming work is being installed, and subsequent investigation proves that the Work was non-conforming, the Contractor shall not be awarded additional time or costs.

8. RIGHT TO CARRY OUT THE WORK

If the Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents and fails within a 10-day period after receipt of written notice from the County or such shorter time as may be reasonable under the circumstances, to commence and continue correction of such default or neglect with diligence and promptness, the County may, without prejudice to other remedies the County may have, correct such deficiencies. In such case an appropriate Change Order shall be issued deducting from payments then or thereafter due the Contractor the reasonable cost of correcting such deficiencies, including the County's expenses, and any additional architect or engineering costs necessary by Contractor's default, neglect or failure. If payments then or thereafter due the Contractor are not sufficient to cover such amounts, the Contractor shall pay the difference to the County upon demand.

9. CONTRACTOR MANAGEMENT PERSONNEL

The Contractor shall keep a competent superintendent and any necessary assistants on the Site at all times during progress of the Work and such persons shall be satisfactory to the Project Officer or designee. The superintendent or project manager shall not be changed except with the Project Officer or designee's consent. If the Project Officer determines that the superintendent or project manager is no longer satisfactory, then the superintendent or project manager must be replaced within 15 days of the Project Officer's written notice with a replacement superintendent or project manager with equal or superior qualifications and subject to Project Officer approval.

The superintendent and project manager shall represent the Contractor and all directions given to such persons shall be as binding as if given to the Contractor. The Contractor shall at all times enforce strict discipline and good order among the workers performing under this Contract and shall not employ on the Work any person not reasonably proficient in the Work assigned. Persons permitted to perform Work under Contractor, or any subcontractor, or sub-subcontractor, shall meet all employment eligibility, safety training, security or drug/alcohol testing requirements required by law or by the County. Any person not complying with all such requirements shall be immediately removed from the Site.

10. DRUG-FREE POLICY

The Contractor is responsible for ensuring that the Site remains a drug-free site. Contractor will require that employees undergo random drug/alcohol screening on a quarterly interval. Any employee who fails the test must be removed from the Site immediately. Random

screening shall be performed by a third party licensed to do so in the Commonwealth of Virginia. The Contractor shall provide its random testing policy and schedule to the Project Officer within 30 days of Notice to Proceed. The Contractor will include this provision in every subcontract relating to this Contract. Any infraction by an employee of the Drug-Free policy shall be reported to the Project Officer within 24 hours.

11. LANDS BY COUNTY

The County shall provide access to the lands shown on the Drawings upon which the Work under the Contract is to be performed and to be used for rights of way and for access. In case all the lands, rights-of-way or easements have not been obtained as herein contemplated before construction begins, then the Contractor shall begin its work on such lands and rights-of-way that the County has acquired access to. No additional time or compensation shall be awarded to the Contractor for modifying work location and sequence provided other locations are available for work.

Contractor shall verify the acquisition of all off-site easements and Rights-of-Way prior to the start of off-site construction. Restore all off-site easements to the conditions existing prior to the start of work.

12. LANDS BY CONTRACTOR

If the Contractor requires additional land or lands for temporary construction facilities and for storage of materials and equipment other than the areas available on the site or right-of-way, or as otherwise furnished by the County, then the Contractor shall provide such other lands and access thereto entirely at the Contractor's own expense and without liability to the County. The Contractor shall not enter upon private property for any purpose without prior written permission of all of the persons and entities who own the property. The Contractor shall provide copies of all agreements to the County and shall include language in the agreement indemnifying and holding the County harmless for any damages, repairs, restoration or fees associated with the use of the property. Upon termination of the agreement, the Contractor shall provide to the County a fully executed release from the property owner.

13. PROTECTION OF WORK AND PROPERTY

a. The Contractor shall continuously maintain and protect all of its Work from damage and shall protect the County's property from damage or loss arising in connection with this Contract until Substantial Completion. After Substantial Completion, the maintenance or protection of any incomplete or remedial Work identified on the punch list that requires maintenance or protection in order to allow for the final completion and acceptance of such Work shall be the responsibility of the Contractor until Final Completion. The Contractor shall make good any such damage or loss, except such as may be caused by agents or employees of the County. Failure to adequately protect the Work shall not be grounds for additional compensation for any maintenance and/or repairs to such Work.

b. The Contractor shall not place upon the Work, or any part thereof, any loads which are not consistent with the design strength of that portion of the Work.

c. The Contractor shall be responsible for the preservation of all public and private property, trees, monuments, etc., along and adjacent to the street and/or right-of-way, and shall use every precaution to prevent damage to pipes, conduits and other underground structures, curbs, pavements, etc., except those to be removed or abandoned in place and shall protect carefully from disturbance or damage all monuments and property marks until an authorized agent has witnessed or otherwise referenced their location and shall not remove them until directed. Any damage which occurs by reason of the operations under this Contract, whether shown or not on the approved construction plans, shall be completely repaired or replaced to the County's satisfaction by the Contractor at the Contractor's expense.

d. Prior to commencing construction activity at the Site, the Contractor shall videotape the Site and an additional fifty (50) feet outside the perimeter of the Site. Contractor shall submit a copy of high-resolution digital recording on a DVD or flash drive to the County. The recording shall be stable, continuous, and contain all items within the limits of Work. Submission of the DVD to the County shall be a condition precedent to any obligation of the County to consider an Application for Payment. The DVD shall be the property of the County, and the County shall be permitted to reproduce such DVD's and use the same for any purpose without limitation or claim of ownership or compensation from any party. Contractor shall incorporate the cost of the preconstruction survey in the bid amount or the unit prices of the bid items, as applicable. No additional payment will be made by the County.

e. The Contractor shall shore, brace, underpin, secure, and protect, as may be necessary, all foundations and other parts of existing structures adjacent to, adjoining, and in the vicinity of the site that may be affected in any way by excavations or other operations connected with the work required under this Contract. The Contractor shall be responsible for giving any and all required notices to owners or occupants of any adjoining or adjacent property or other relevant parties before commencement of any work. Contractor shall provide all engineering (signed and sealed) for items listed in this section per the Specifications. The Contractor shall indemnify and hold the County harmless from any damages on account of settlements or loss of all damages for which the County may become liable in consequence of such injury or damage to adjoining and adjacent structures and their premises.

f. In an emergency affecting the safety of life or of the Work, or of adjoining property, the Contractor, without special instruction or authorization from the Project Officer or designee, or the County, is hereby permitted to act, at the Contractor's discretion, to prevent such threatened loss or injury, and the Contractor shall so act without appeal, if so instructed or authorized.

14. <u>SEPARATE CONTRACTS</u>

a. The County reserves the right to let other contracts in connection with this Project. The Contractor shall afford other contractors' reasonable access to the Project including storage of their materials and the execution of their work and shall properly connect and coordinate its work with the work of other such contractors.

b. If any part of the Contractor's work depends, for proper execution or results, upon the work of any other contractor, the Contractor shall inspect and promptly report to the Project Officer or designee any defects in such work that renders it unsuitable for such proper execution and results. The Contractor's failure to so inspect and report shall constitute an acceptance of the other contractor's work as fit and proper for the reception of the Contractor's work, except as to defects which may develop in other contractor's work after its execution.

c. If the Contractor or any of the Contractor's subcontractors or employees cause loss or damage to any separate contractor on the Work, the Contractor agrees to settle or make every effort to settle or compromise with such separate contractor. If such separate contractor sues the County on account of any loss so sustained, the County shall notify the Contractor, who shall indemnify and save the County harmless against any expense, claim or judgment arising therefrom, including reasonable attorney's fees.

d. In case of a dispute arising between two or more separate contractors engaged on adjacent work as to the respective rights of each under their respective contracts, the Project Officer shall determine the rights of the parties.

15. <u>SUBCONTRACTS</u>

a. Unless otherwise specified, the Contractor shall, within fifteen (15) calendar days after the execution of the Contract by the County, provide to the Project Officer or designee, in writing, the names of all subcontractors proposed for the principal parts of the Work and for such others as requested by the Project Officer or designee, and shall not employ any subcontractors that the Project Officer or designee may object to as incompetent or unfit after an appropriate determination of the subcontractor's ability. No proposed subcontractor will be disapproved except for cause.

b. The Contractor shall make no substitutions for any subcontractor previously selected/approved unless first submitted to the County for approval.

c. The Contractor shall be as fully responsible to the County for the acts and omissions of the Contractor's subcontractors as the Contractor is for the acts and omissions of persons directly employed by the Contractor.

d. The Contractor shall cause appropriate provisions to be inserted in all subcontracts relative to the Work to bind subcontractors to the Contractor by the terms of the General Conditions of the Contract, Special Provisions and other Contract Documents comprising the Contract insofar as such documents are applicable to the work of subcontractors.

e. Nothing contained in the Contract shall be construed to create any contractual relation between any subcontractor and the County, nor shall it establish any obligation on the part of the County to pay to or see to the payment of any sums to any subcontractor. The County will not discuss, negotiate or otherwise engage in any contractual disputes with any subcontractor.

f. If requested by the County, the Contractor shall replace any subcontractor at no cost to the County within 30 days of the Project Officers written notice or as otherwise specified. No additional time or compensation will be provided in the event a subcontractor is removed due to non-compliance of the requirements outlined within the Contract.

16. ELIMINATED ITEMS

If any item(s) in the Contract are determined to be unnecessary for the proper completion of the Work contracted, the Project Officer or designee may, upon written notice to the Contractor, eliminate such item(s) from the Contract. Payment will not be made for such item(s) so eliminated; except that the Contractor will be compensated for the actual cost of any work performed and the net cost of materials purchased before the item(s) was eliminated from the Contract, including freight and tax costs, as evidenced by invoice. No additional compensation will be made for overhead or anticipated profit. The County will receive the full unit price credit for work eliminated prior to production or installation.

17. COUNTY ORDINANCES

The Contractor shall comply with all applicable County ordinances, including but not limited to: The *Noise Control, Erosion & Sediment Control, Storm Water Management, and Chesapeake Bay Preservation ordinances (Chapters 15, 57, 60, and 61 of the County Code).*

D. MATERIALS AND WORKMANSHIP

1. MATERIALS FURNISHED BY THE CONTRACTOR

Unless otherwise specified, all materials and equipment incorporated in the Work under the Contract shall be new. All work shall be accomplished by persons qualified in the respective trades.

2. IBC AND VUSBC REQUIREMENTS

The Contractor certifies that all material supplied or used under this Contract meets all current International Building Code (IBC) requirements and the requirements of the Virginia Uniform Statewide Building Code (VUSBC); and further certifies that, if the material delivered or used in the performance of the work is found to be deficient in any of the applicable state or national code requirements, all costs necessary to bring the material into compliance with the requirements shall be borne by the Contractor. The County shall be entitled to offset such costs against any sums owed by the County to the Contractor under this Contract.

3. ADA COMPLIANCE

The Contractor shall ensure that all Work performed under this Agreement is completed in accordance with the Contract Documents, including Work intended to meet the accessibility requirements of the Americans with Disabilities Act (ADA).

The Contractor is not required to ascertain whether the Contract Documents meet ADA design standards and guidelines. However, should the Contractor discover any non-conformity with such requirements, the Contractor shall immediately inform the County and its design consultant, if applicable, to allow for corrective action.

The Contractor shall defend and hold the County harmless from any expense or liability arising from the Contractor's non-compliance in meeting its obligations herein. The Contractor shall be responsible for all costs related to permitting delays, redesign, corrective Work, and litigation relating to such non-compliance.

4. MANUFACTURER'S DIRECTIONS

Manufactured articles, material, and equipment shall be applied, installed, connected, erected, used, cleaned, and conditioned in accordance with the manufacturer's directions as accepted by the Project Officer or designee, unless herein specified to the contrary.

5. WARRANTY

All material provided to the County shall be fully guaranteed by the Contractor against manufacturing defects within the period of the manufacturer's standard warranty. Such defects shall be corrected by the Contractor at no expense to the County. The Contractor shall provide all manufacturers' warranties to the Project Officer by the date of Final Completion.

All Work is guaranteed by the Contractor against defects resulting from the use of inferior or faulty materials. The Contractor warrants that the Work will conform to the requirements of the Contract Documents and will be free from defects or inferior or faulty workmanship, or work not in accordance with the Contract Documents for one (1) year from the date of Substantial Completion or as set forth in the Specifications of the work by the County in addition to and irrespective of any manufacturer's or supplier's warranty.

No date other than Substantial Completion or as set forth in the Specifications shall govern the effective date of the Warranty, unless that date is agreed upon by the County and the Contractor in advance and in a signed writing.

The Contractor shall promptly correct any defective work or materials after receipt of a written notice from the County to do so. If the Contractor fails to proceed promptly or use its best efforts and due diligence to complete such compliance as quickly as possible, the County may have the materials or work corrected and the Contractor and its Sureties shall be liable for all expenses and costs incurred by the County.

Nothing contained in this section shall be construed to establish a period of limitations with respect to other obligations the Contractor may have under this Contract.

6. INSPECTION AND ACCEPTANCE OF MATERIALS

Inspection and acceptance by the County will be at the work site in Arlington County, Virginia and within ten (10) calendar days of delivery unless otherwise provided for in the Contract Documents. The County will not inspect, accept, or pay for any materials stored or delivered off-site by the Contractor, except as provided by the Payment for Stored Materials clause of these General Conditions and other requirements of the Contract Documents. The County's right of inspection shall not be deemed to relieve the Contractor of its obligation to ensure that all articles, materials and supplies are consistent with Specifications and instructions and are fit for their intended use. The County reserves the right to conduct any tests or inspections

it may deem appropriate before acceptance. The Contractor shall be responsible for maintaining all materials and supplies in the condition in which they were accepted until they are used in the work.

The Contractor is to coordinate its work and request inspections in such a manner as to minimize the cost to the County without impacting the overall schedule of the Project within reason. All costs associated with re-inspection shall be borne by the Contractor.

7. CONTRACTOR'S TITLE TO MATERIALS

No materials or supplies for the work shall be purchased by the Contractor or any subcontractor subject to any chattel mortgage or under a conditional sale or other agreement by which an interest is retained by the seller. The Contractor warrants that it has good title to, and that it will require all subcontractors to warrant that they have good title to, all materials and supplies for which the Contractor invoices for payment. The County may request proof of title or payment prior to acceptance of the Contractors invoice.

8. TITLE TO MATERIALS AND WORK COVERED BY PARTIAL PAYMENTS

All material and work covered by partial payments made by the County will become the property solely of the County at the time the partial payment is made. However, risk of loss or damage to all items shall be the responsibility of the Contractor until Final Acceptance by the County. This provision will not be construed as relieving the Contractor from having sole responsibility for all materials and work upon which payments have been made and for the restoration of any damaged work or replacement or repair at the County's option of any damaged materials. This provision will not be construed as a waiver of the County's right to require fulfillment of all terms of the Agreement, including full rights under the terms of the Warranty provisions of the Agreement, nor shall payment indicate acceptance of the materials or work.

9. CONNECTING WORK

The Contractor shall do all cutting, patching, or digging of the Contractor's work that may be required to make its several parts come together properly and fit it to receive or be received by work of other contractors as shown upon or reasonably implied by the Drawings and Specifications for the completed Project and shall make good after them as the Project Officer or designee may direct. This work will be performed in a workmanlike manner utilizing proper care and equipment to achieve proper line and grade. The Contractor shall not endanger any work by cutting, patching, or digging, or otherwise, and shall not cut or alter the work of any other contract except with the prior written consent of the Project Officer or designee.

10. REJECTED WORK AND MATERIALS

a. Any of the Work or materials, goods, or equipment which do not conform to the requirements of the Contract Documents, or are not equal to samples accepted by the Project Officer or designee, or are in any way unsatisfactory or unsuited to the purpose for which they are intended, shall be rejected and replaced immediately so as not to cause delay to the Project or work by others. Any defective work, whether the result of poor workmanship, use of defective materials, damage through carelessness or any other cause, shall be removed and the work shall be re-executed by the Contractor at

the Contractor's expense. The fact that the Project Officer or designee may have previously overlooked such defective work shall not constitute acceptance of any part of it.

b. If the Contractor fails to proceed at once with the replacement of rejected material and/or the correction of defective workmanship when notified to do so by the Project Officer or designee, the County may, by contract or otherwise, replace such material or correct such workmanship and charge the cost to the Contractor. This clause applies during the Contract and during any warranty or guarantee period.

c. The Contractor shall be responsible for managing, addressing within a timely manner, and formally closing out all notices of non-compliance issued by the inspector of record, Arlington County Inspection Services, or the Design Team. The Contractor shall be solely liable for any costs or time associated with the corrective action to address any notices of non-compliance. The Contractor must work directly with the entity issuing the notice of non-compliance.

d. If the Project Officer or designee deems it expedient not to require correction of work which has been damaged or not done in accordance with the Contract, an appropriate adjustment to the Contract Price may be made.

11. PROHIBITION AGAINST ASBESTOS CONTAINING MATERIALS

No goods or equipment provided to the County or construction material installed shall contain asbestos. If a Contractor or supplier provides or installs any goods, equipment, supplies, or materials that contain asbestos in violation of this prohibition, the Contractor shall be responsible for all costs related to the immediate removal and legal disposal of the goods, equipment or materials containing asbestos and replacement with County-approved alternate. The Contractor shall be responsible for all goods, equipment, supplies or materials installed or provided by any of its employees, agents or subcontractors in connection with the work under this contract. The Contractor shall also reimburse to the County all costs of such goods, equipment, supplies or materials installed if not corrected by the Contractor.

E. LEGAL RESPONSIBILITY AND PUBLIC SAFETY

1. SITE INVESTIGATION AND CONDITIONS AFFECTING THE WORK

The Contractor acknowledges that it has taken steps reasonably necessary to ascertain the nature and locations of the work of the Contract, and that it has investigated and satisfied itself as to the general and local conditions and factors which can affect the Work or its cost, including but not limited to:

a. conditions bearing upon transportation, disposal, handling, and storage of materials;
b. the availability of labor, water, electric power, and roads;
c. uncertainties of weather, river stages, tides, or similar physical conditions at the site;
d. the information and conditions of the ground; and

e. the character of equipment and facilities needed before and during work performance.

The Contractor, by executing the Contract, represents that it has reviewed and understands the Contract Documents and has notified the County of and obtained clarification of any discrepancies which have become apparent during the bidding period. During the Contract, the Contractor must promptly notify the County in writing of any apparent errors, inconsistencies, omissions, ambiguities, construction impracticalities or code violations discovered as a result of the Contractor's review of the Contract Documents including any differences between actual and indicated dimensions, locations and descriptions, and must give the County timely notice in writing of same and of any corrections, clarifications, additional Drawings or Specifications, or other information required to define the Work in greater detail or to permit the proper progress of the Work. The Contractor must provide similar notice with respect to any variance between its review of the Site and physical data and Site conditions observed. If the Contractor performs any Work involving an apparent error, inconsistency, ambiguity, construction impracticality, omission or code violation in the Contract Documents of which the Contractor is aware, or which could reasonably have been discovered, without prompt written notice to the County and request for correction, clarification or additional information, as appropriate, the Contractor does so at its own risk and expense and all related claims are specifically waived.

The Contractor also acknowledges that it has satisfied itself as to the character, quality, and quantity of surface and subsurface materials or obstacles to be encountered insofar as this information is reasonably ascertainable from an inspection of the site, including all exploratory work done by the County, as well as from the Drawings and Specifications made a part of this Contract. Unless otherwise specified, all existing structures, materials and obstructions that interfere with the new construction shall be removed and disposed of as part of this Contract. Any failure of the Contractor to take the actions described and acknowledged in this paragraph will not relieve the Contractor from responsibility for estimating properly the difficulty and cost of successfully performing the Work without additional expense to the County.

The locations of existing utilities, including underground utilities, which may affect the Work, are indicated on the Drawings or in the Specifications insofar as their existence and location were known at the time of preparation of the drawings. However, nothing in these Drawings or Specifications shall be construed as a guarantee that such utilities are in the location indicated or that they actually exist, or that other utilities are not within the area of the operations. The Contractor shall make all necessary investigations to determine the existence and locations of such utilities. Should uncharted or incorrectly charted utilities be encountered during performance of the Work, notify the Project Officer or designee immediately for instructions. The Contractor will be held responsible for any damage to and maintenance and protection of existing utilities and structures, of both public and private ownership. However, if it is determined that such existing utility lines or structures require relocation or reconstruction or any other work beyond normal protection, then such additional work will be ordered under the terms of the clause entitled "Changes in Work." At all times, cooperate with the County and utility companies to keep utility services and facilities in operation.

The County assumes no responsibility for any conclusions or interpretations made by the Contractor based on the information made available by the County. The County assumes no responsibility for any understanding reached or representation made concerning conditions which can affect the Work by any of its officers or agents before the execution of this Contract, unless that understanding, or representation is expressly stated in this Contract.

2. PUBLIC CONVENIENCE

The Contractor shall at all times so conduct its Work as to ensure the least possible obstruction to traffic (vehicular, bicycle and pedestrian) and inconvenience to the general public, County employees, and the residents in the vicinity of the Work. Traffic shall be maintained in accordance with the approved MOT plan. No road, street or sidewalk shall be closed to the public except with the permission of the Project Officer or designee and or proper governmental authority. Fire hydrants on or adjacent to the Work shall be kept accessible to firefighting equipment at all times. Temporary provisions shall be made by the Contractor and included in the cost of the Work to ensure the use of sidewalks, trails, and transit facilities compliant with all applicable ADA and other regulations, as well as the proper functioning of all gutters, drainage inlets, drainage ditches, and irrigation ditches, which shall not be obstructed except as approved by the Project Officer or designee.

3. SAFETY AND ACCIDENT PREVENTION

The Contractor shall comply with, and ensure that the Contractor's employees and subcontractors comply with, all current applicable local, state and federal policies, regulations and standards relating to safety and health, including, by way of illustration and not limitation, the U.S. Department of Labor’s Occupational Safety and Hazard Administration (OSHA) Construction Industry Regulations, the standards of the Virginia Occupational Safety and Health program of the Department of Labor and Industry for General Industry and for the Construction Industry, the Federal Environmental Protection Agency Standards and the applicable standards of the Virginia Department of Environmental Quality.

The Contractor shall provide, or cause to be provided, all technical expertise, qualified personnel, equipment, tools and material to safely accomplish the Work specified to be performed by the Contractor and subcontractor(s).

The Contractor shall identify to the County Project Officer at least one on-site person who is the Contractor's competent, qualified, and authorized safety officer on the worksite and who is, by training or experience, familiar with and trained in policies, regulations and standards applicable to the work being performed. The competent, qualified and authorized person must be capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous or dangerous to employees, shall be capable of ensuring that applicable safety regulations are complied with, and shall have the authority and responsibility to take prompt corrective measures, which may include removal of the Contractor's personnel from the work site.

The Contractor shall provide to the County, within 7 days of issuance of the Notice to Proceed, a copy of the Contractor's written safety policies and safety procedures applicable to the

scope of work. Failure to provide this information within may result in cancellation of the Contract.

The Contractor shall exercise proper precaution at all times for the protection of persons and property and shall be responsible for all injury to persons and damage to property either on or off the site, which occur as a result of the Contractor's prosecution of the Work.

The Contractor shall take or cause to be taken such additional safety and health measures as the County may determine to be reasonably necessary. Machinery, equipment, and all hazards shall be guarded in accordance with the safety provisions of the current version of "Manual of Accident Prevention" published by the Associated General Contractors of America, Inc., to the extent that such provisions are not in conflict with applicable local laws. The Contractor is directed to the "Rules and Regulations Governing Construction, Demolition and All Excavation" and adopted by the Safety Codes Commission of Virginia, 1966, or latest edition, covering requirements for shoring, bracing, and sheet piling of trench excavations.

4. HAZARDOUS MATERIALS

Arlington County is subject to the Hazard Communication Standard, 29 CFR §1910.1200 (Standard). The Contractor agrees that it will provide or cause to be provided Safety Data Sheets (SDS) required under the Standard for all hazardous materials supplied to the County or used in the performance of the work. Such SDS shall be delivered to the County no later than the time of actual delivery of any hazardous materials to the County or use of such material in the performance of work under the Contract by the Contractor or its subcontractors, whichever occurs first. Container labeling meeting the requirements of the Standard shall be appropriately affixed to the shipping or internal containers. The County reserves the right to refuse shipments of hazardous materials not appropriately labeled, or when SDS have not been received prior to or at the time of receipt of the shipment for use by the County or for use by the Contractor in the performance of the Contract, or whenever the material is delivered in a manner inconsistent with any applicable law or regulation. Any expenses incurred due to the refusal or rejection of SDS are the responsibility of the Contractor. The Contractor shall comply with all federal, state, and local laws governing the storage, transportation, and use of toxic and hazardous materials. The Contractor shall maintain onsite an up to date SDS binder for all material used and delivered to the Project. The County Project Officer or his designee shall be allowed access to the SDS book at all times.

5. HAZARDOUS WASTE

Hazardous Waste Generator/Hazardous Waste Disposal: The County Board of Arlington County, Virginia and the Contractor shall be listed as Co-generators. The Contractor shall assume all the duties pertaining to the Waste Generator, including signing the Waste Shipment Record ("WSR") and manifest. The Contractor shall supply the County Project Officer with the executed original Owner's Copy of the WSR, as required by applicable regulatory agencies within 35 days from the time the waste was accepted by the initial waste transporter, and prior to request for final payment. A separate WSR shall be submitted for each shipment to the disposal site.

Delayed Waste Shipment Records: The Contractor shall report in writing to the EPA Region III office within 45 days if an executed copy of the WSR is not received from the operator of the

disposal site. The report to the EPA regional office shall include a copy of the original WSR and a cover letter signed by the Contractor stating the efforts taken to locate the hazardous waste shipment and the results of those efforts.

Temporary Hazardous Waste Storage Prohibited: The Contractor shall not temporarily store hazardous waste unless pre-approved by the County in writing. If so approved, hazardous waste stored off-site in a temporary facility shall be monitored and records shall be kept on the number of containers, size, and weight. The Contractor shall inform the County when the hazardous waste is to be transported to the final disposal site. The County has the right to inspect the temporary site at any time. The Contractor shall submit copies of all relevant manifests, Waste Shipment Record(s), and landfill receipts to the County Project Officer prior to the request for final payment. All paperwork shall be signed by the Contractor and disposal site operator as required.

6. ASBESTOS

Whenever and wherever during the course of performing any work under this Contract the Contractor discovers the presence of asbestos or suspects that asbestos is present, the Contractor shall stop work immediately, secure the area, notify the County Project Officer immediately and await positive identification of the suspect material. During the downtime in such a case, the Contractor shall not disturb any surrounding surfaces but shall protect the area with suitable dust covers. Work shall not proceed without an Asbestos-Related Work Authorization executed by the County Asbestos Program Manager.

7. CROSSING UTILITIES

When construction crosses highways, railroads, streets, waterways, or utilities under the jurisdiction of State, County, City, or other public agency, public utility, or private entity, the Contractor shall secure written permission where necessary from the proper authority before executing such new construction. A copy of such written permission must be filed with the County before any work is started. The Contractor shall be required to furnish a release from the proper authority before Final Acceptance of the Work.

8. OVERHEAD HIGH VOLTAGE LINES SAFETY ACT

If any work required herein will be performed within ten feet of an overhead high voltage line, the provisions of Virginia Statute 59.1-406, et. seq., "Overhead High Voltage Line Safety Act" (Act) shall apply. The "person or contractor responsible for the work to be done", as that term is used in the Act, will be interpreted to mean the Contractor. The Contractor shall notify the owner or operator of the high voltage line in the manner prescribed in Section 59.1-411 of the Act in sufficient time prior to the time work is to be commenced to avoid any delays in the work. The County will not pay for lost time, profits, or permit any extension of the work for any delays caused by the failure of the Contractor to make such arrangements in a timely manner. All costs for the work shall be paid by the Contractor. The County shall reimburse the Contractor for the actual reasonable cost paid to the owner or operator of the high voltage line by the Contractor on presentation to the County by the Contractor of original invoices from the owner or operator of the high voltage line in the same manner as for other Contractor invoices submitted for work performed. Retention, if applicable to the Contract, shall not be withheld from the payment to the Contractor by the County for this work. No

processing, administrative, or other charges above the actual amount charged by the owner or operator of the high voltage line shall be paid to the Contractor by the County.

9. SANITARY PROVISIONS

The Contractor shall provide and maintain such sanitary accommodations for the use of the Contractor's employees and those of its subcontractors as may be necessary to comply with the requirements and regulations of OSHA and of the local and State departments of health.

10. SITE CLEAN-UP AND WASTE DISPOSAL

The Contractor shall frequently remove and properly dispose of all refuse, rubbish, scrap materials, and debris from the site resulting from the Contractor's operations during the performance of this contract. The Contractor shall ensure the work site presents a neat and orderly appearance at all times. The Contractor shall isolate any and all dumpsters, trash cans and recycling bins provided for the Project from public use until Final Acceptance.

Unless otherwise stated, the Contract Amount and any unit prices shall include all costs and fees for removal and disposal of all waste and debris, whether disposed of at a County site or at any other location.

The Contractor shall remove all surplus material, false work, temporary structures including foundations thereof, and debris resulting from the Contractor's operations at work completion and before Final Acceptance. The County shall reserve the right to remove the surplus material, false work, temporary structures including foundations and debris. The County will restore the site to a neat, orderly condition if the Contractor fails to do so. The County shall be entitled to offset such cost against any sums owed by the County to the Contractor under this Contract.

11. STORMWATER POLLUTION PREVENTION PLAN (SWPPP)

When the Project includes an approved SWPPP, the Contractor shall strictly abide by this plan which includes: A Pollution Prevention (P2) Plan, an Erosion and Sediment Control (E&S) Plan, and a Stormwater Management Plan. If the Contractor proposes to deviate from this approved plan, it shall be the Contractor’s responsibility to coordinate and obtain approval from the County Project Officer prior to implementing any changes.

No separate payment shall be made by the County for SWPPP implementation, with the exception of E&S items as specified on the E&S plans or listed as pay items. The Contractor shall not be entitled to any additional payment for changes to the SWPPP which are the result of the Contractor’s work schedule or resource allocation, weather delays, or other factors not controlled by the County.

F. PROGRESS AND COMPLETION OF THE WORK

1. NOTICE TO PROCEED

The Contractor shall be given written Notice to Proceed with the Work. Such Notice to Proceed shall state the date on which the Work is to be commenced, and every calendar day thereafter shall be counted in computing the actual Time for Completion.

2. TIME FOR COMPLETION

It is hereby understood and mutually agreed by and between the Contractor and the County that the Commencement Date, the rate of progress, and the Time for Completion of the Work to be done hereunder are essential conditions of the Contract. The Contractor agrees that the Work shall be started promptly upon receipt of a written Notice to Proceed in accordance with the accepted schedule. The Work shall be prosecuted regularly, diligently, and uninterruptedly at a rate of progress that will ensure full completion of the Project within the Time for Completion specified in the Contract Documents.

3. SCHEDULE OF COMPLETION

Unless otherwise specified, the Contractor shall within 10 business days after the Award Date, or prior to the pre-construction meeting, whichever occurs first, submit schedules which show the order in which the Contractor proposes to carry on the Work, with dates for starting and completing the various activities of the Work. The Contractor shall submit an updated schedule monthly with the request for partial payment. Review and acceptance by the County of the Contractor's schedule of completion shall in no way relieve the Contractor of its responsibility to complete the Work within the contract time. If the Work falls behind the schedule, the County may require the Contractor to prepare and submit, at no extra cost to the County, a recovery schedule indicating by what means the Contractor intends to regain compliance with the schedule. The recovery schedule must be submitted to the County for review by the date indicated in the County's written demand.

4. CONDITIONS FOR COMPLETION

a. SUBSTANTIAL COMPLETION: The Work will be considered Substantially Complete when all of the following conditions have been met and accepted by the Project Officer, and a Certificate of Substantial Completion has been issued:

1. The Contractor has provided formal notice that the Work is substantially complete, and the Project Officer has agreed that the condition of the Work warrants a Substantial Completion inspection;

2. The Contractor has provided a Punch List and that list has been reviewed and approved by the Project Officer. Failure to include an item on the Punch List does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents;

3. Final test reports as required by the Contract and certificates of inspection and approval required for use and occupancy;

4. Fire Marshal's report, if applicable;

5. Approval forms and transfer documents for all utilities;

6. All life safety systems, including fire alarms, visual and audios alarms, fire detectors and fire alarm annunciator system, sprinkler systems, and all

mechanical and electrical systems are complete and working in an automatic mode, and the County has been adequately trained in the operation of the systems;

7. The HVAC system Testing and Balancing Report and build air quality test results as required for LEED certification have been accepted by the Project Officer;

8. Operation and Maintenance Manuals have been submitted for review;

9. All documents and verification of training required in accordance with any Commissioning Plan;

10. Mark-ups of construction drawings showing the Record or "Record" condition have been submitted for review and approval by the Project Officer;

12. Entrances and egress pathways have been constructed and can remain clear of construction activities;

13. A Certificate of Occupancy has been issued for the space by the County's Inspection Services Division;

14. All Commissioning has performed and completed to the satisfaction of the Project Officer; and

15. Schedule to complete the Punch List and value of Work not yet complete.

b. Upon the Contractor providing notice that the Work is substantially complete, the Project Officer or designee will invite all relevant parties to perform an inspection of the Work, and any noted deficiencies or incomplete items not indicated on the Contractor's punch list will be added. All punch list items, whether generated by the Contractor or any other party on behalf of the County, shall be completed within thirty (30) days of the date of Substantial Completion, unless otherwise agreed to by the County due to seasonal or other extenuating circumstances.

c. FINAL COMPLETION: The Work will be considered Finally Complete when all of the following conditions have been met and accepted and a Final Completion Notice has been issued by the Project Officer:

1. The Contractor has provided formal notice that the Work is complete, and the Project Officer has agreed that the condition of the Work warrants a Final Completion inspection;

2. All construction deficiencies and punch list items have been closed and all construction deficiencies corrected and accepted by the Project Officer;

3. All spare parts and attic stock have been delivered, stored in an orderly manner in a space designated by the Project Officer and a complete inventory list has been verified and accepted by the Project Officer;

4. All warranties and manufacturer certificates and contact information for parties providing warranties have been delivered and accepted by the Project Officer;

5. All final Operating and Maintenance manuals have been delivered and approved and accepted by the Project Officer;

6. All final Record Drawings in .pdf format on a CD delivered and accepted by the Project Officer;

7. All commissioning has been completed and any open construction items in the commissioning agent's report have be closed and accepted by the Project Officer; and

8. All LEED documents and submittals, if applicable, to be provided by the Contractor or sub-contractors have been submitted and accepted by the Project Officer.

5. USE OF COMPLETED PORTIONS

The County shall have the right to take possession of and use any completed or partially completed portions of the Work, notwithstanding that the time for completing the entire Work or such portions may not have expired; but taking such possession and use shall not be deemed an acceptance of any work not done in accordance with the Contract Documents. If the Contractor claims that such prior use increases the cost or delays, the completion of remaining work, or causes refinishing of completed work, the Contractor may submit a claim for compensation or extension of time, or both.

G. MEASUREMENT AND PAYMENT

1. PAYMENTS TO CONTRACTOR

The County will make partial payments, less retainage, to the Contractor monthly on the basis of the Contractor's written estimate of the work performed during the preceding calendar month as approved by the Project Officer or designee.

The Contractor's application for payment shall indicate the amount of work completed to date in a format consistent with the accepted bid and as indicated below:

a. Lump Sum: For lump sum contracts, the Contractor shall provide to the Project Officer a Schedule of Values, and the application for payment will reflect the Schedule of Values and the amount of work completed in those units.

For contracts that include multiple lump sum line items, the application for payment shall reflect the percentage of work completed for each lump sum item. If requested

by the Project Officer, the Contractor shall provide a Schedule of Values for each lump sum line item in the contract.

b. Unit Price: The schedule of unit prices in the accepted bid shall be used as the basis for preparing the estimates, and each partial payment shall represent the total value of all units of work completed, computed at the unit prices stated in the Contract, less the aggregate of previous payments.

At the discretion of the Project Officer, payments may alternatively be based on actual quantities and site measurements taken in the field by County staff using the Contract Unit Prices.

If Stipulated Price Items are included in the contract, Work on such Stipulated Price Items shall be carried out only upon written order by the Project Officer. The payment for a Stipulated Price Item shall be made by the County to the Contractor at the related unit price specified in the 'Stipulated Price Items' section of the Bid Form on the same basis as the payment for any other regular Bid Item.

In addition to the amount of work completed to date, the application for payment shall indicate the aggregate of all previous payments for each line item, the retainage previously withheld, and the total payment requested this period.

The Contractor's application for payment will not be reviewed or processed unless an updated schedule is attached. The pay application shall also contain a certification by the Contractor that due and payable amounts have been paid by the Contractor, including payments to subcontractors, for work which previous payment was received by the Contractor from the County.

5. PAYMENT FOR STORED MATERIALS

When requested in writing by the Contractor, payment allowances may be made for material secured for use on the Project and secured at the project site. Such payments will only be made for materials scheduled for incorporation into the work within sixty (60) days.

Payment for materials stored offsite may be considered at the discretion of the Project Officer. Any such request shall be made in writing, and the Contractor shall provide photographs of materials stored offsite, bills of sale, and proof of insurance on the premises at which off-site materials are stored with the application for payment. Payment for stored materials may also be subject to additional requirements contained elsewhere in the Contract Documents.

6. PAYMENTS WITHHELD

The Project Officer or designee may withhold or, on account of subsequently discovered evidence, nullify the whole or a part of any certificate for payment to the extent necessary to protect the County from loss on account of defective work not remedied or withhold payment for violation of any contract term or condition not remedied after sufficient notice given to the Contractor.

Any such withholding shall not result in any liability to the Contractor for damages.

7. COUNTY ORDERED CHANGES IN WORK

The County, without invalidating the Contract, may order extra Work or make changes by addition, deletion or revision in the Work, with the total Contract Amount being adjusted accordingly if applicable. Any change that will increase the Contract Amount more than 10% will require notice to sureties and require that Performance and Payment Bonds be increased by the Contractor. The increased Performance and Payment Bonds must be sent to the County's Office of the Purchasing Agent within 15 calendar days of the County's approval of such change. All such work shall be executed under the conditions of the original Contract, except that modification of the Time for Completion caused thereby shall be made at the time of approving such change.

a. The Project Officer or designee shall have authority to make minor changes in the Work by verbal order when such changes do not involve extra cost and are not inconsistent with the purpose of the Project. Otherwise, except in an emergency endangering life or property, no extra Work or change shall be made unless in pursuance of a written Construction Change Directive or Change Order and no claim for an addition to the Contract Amount or Contract Time shall be valid unless so ordered.

b. The Contractor shall review any County requested or directed change and shall respond in writing within 14 days after receipt of the proposed change stating the effect of the proposed change upon Contractor's work, including any increase or decrease in Contract time and price. The Contractor shall furnish the County an itemized breakdown of the quantities and prices used in computing the proposed change. The Contractor shall also furnish any sketches, drawings, and or pictures to properly explain the change or impact to the Project Officer. It is the sole responsibility of the Contractor to provide adequate change order backup to satisfy the Project Officer.

c. The value of any such extra work or change shall be proposed by the Contractor in one or more of the following ways: (a) by estimate in a lump sum; (b) by cost and fixed fee; (c) by unit price additions or deletions of quantities stated in the unit price contract; or (d) by any other method permitted under the Arlington County Purchasing Resolution. The Project Officer will determine the method appropriate based on the nature of the changes.

d. If none of the aforementioned methods is agreed upon the Contractor shall proceed with the work without delay under force account, provided the Contractor receives a Construction Change Directive. In such case, the Contractor shall keep and present in such form as the Project Officer or designee may direct, a correct account of the cost, together with vouchers. The Project Officer or designee shall be permitted to verify such records on a daily basis and may require such additional records as are necessary to determine the cost of the change to the Work. The Project Officer or designee shall certify to the amount due to the Contractor, including a reasonable lump sum allowance for overhead and profit. A complete accounting of the extra cost shall be made within 14 days after completion of the work involved in the claim. Refer to Paragraph G.5,

Force Account Work, below for a description of allowable costs when work is performed under force account.

e. A cost proposal for a change in the Work shall provide a complete breakdown itemizing the estimated quantities and costs of labor, materials, and equipment (base cost) required in addition to any markup used. The allowable percentage markups for overhead and profit for a non-force account change to the Work performed by the Contractor's own forces or performed by the Subcontractor shall be negotiated based on the nature, size, and complexity of the Work involved but shall not exceed the percentages for each category listed below.

   1) Subcontractor's markup for overhead and profit for the work it performs in a change to the Work shall be a maximum of fifteen (15%).

   2) Contractor's markup for overhead and profit on the Subcontractor's base cost in a change to the Work shall be a maximum of ten percent (10%).

   3) Contractor's markup for overhead and profit (including bonds and insurance) for work it performs in a change to the Work shall be a maximum of fifteen percent 15%.

   4) The markup for overhead and profit of a sub-subcontractor at any tier on a change to the Work it performs shall be a maximum of fifteen percent (15%). The Contractor and all intervening tiers of subcontractors' markup on such sub-subcontractor's base cost in the change to the Work shall not exceed a total of ten percent (10%).

f. Base Cost is defined as the total of labor, material, and equipment costs, it does not include markup for overhead and profit. The labor costs include only the costs of employees directly constructing or installing the change in the Work and exclude the costs of employees coordinating or managing the work.

g. The allowable percentage markups for overhead and profit stated above shall compensate the Contractor, subcontractor, and sub-subcontractor for all other costs associated with or relating to the change to the Work including by way of illustration and not limitation, general conditions, supervision, field engineering, coordination, insurance, bond(s), use of small tools, incidental job costs, and all other general and administrative home and field office expenses.

h. Allowable costs for changes in the Work shall not include home office expenses including payroll costs for the Contractor's officers, executives, administrators, project managers, estimators, clerks' timekeepers, and other administrative personnel employed by the Contractor, whether at the Site or in the Contractor's principal or branch office for general administration of the Work. These costs are deemed overhead included in the percentage markups in Subsection (e) above.

i. If the change to the Work also changes the Time for Completion by adding days to perform the Work, an itemized accounting of the following Site direct overhead expenses for the change to the time may be considered as allowable costs for compensation in addition to the base cost indicated above:

1) site superintendent's pro-rata salary
2) temporary site office trailer expense
3) temporary site utilities including basic telephone service, electricity, heat, water, and sanitary/toilet facilities.

All other direct and indirect overhead expenses are considered covered by and included in Subsection (e) markups above. In no case shall subcontractor extended overhead be submitted or considered. The County does not have a direct contractual relationship with any subcontractor or supplier and therefore will not direct, discuss or negotiate with subcontractors employed by the Contractor.

j. If Contractor requests an extension to the Time for Completion due to changes in the Work it must provide to the Project Officer adequate documentation substantiating its entitlement for the time extension. The documentation must demonstrate an anticipated actual increase in the time required to complete the Work beyond that allowed by the Contract as adjusted by prior changes to the Work, not just an increase or decrease in the time needed to complete a portion of the total Work. In the event a Critical Path Method (CPM) schedule is required by the Contract, no extension to the Time for Completion shall be granted unless the additional or change to the Work increases the length of the critical path beyond the Time for Completion as demonstrated on the approved CPM schedule or bar chart schedule. Any Float belongs to Arlington County. A written statement in addition to a CPM analysis shall be prepared explaining how no other sequence of work activities could have been performed to decrease the impact or eliminate the impact altogether. If requested by the Project Officer, the Contractor must provide alternate documentation detailing the claim to the County's satisfaction.

8. <u>FORCE ACCOUNT WORK</u>

A Force Account may be used at the County's discretion and only when either 1) agreement on the valuation of a change cannot be made using the methods described in the preceding paragraph, *County Ordered Changes in the Work*, or 2) the County cannot firmly establish an applicable and acceptable estimate for the cost of the work because the level of effort necessary to perform and complete the work cannot be reasonably estimated or anticipated but can only be determined by performing the work. Because of the significant burden on the County to monitor and control the work, Force Account work is not a preferred method, and it shall be the responsibility of the Contractor to provide all necessary documentation and justification of costs. The rates for labor, equipment and materials to be used in cases of work performed on a force account basis will be compensated as documented below. No costs other than those explicitly listed below shall be allowed:

a. Labor: Before any Force Account work begins, the Contractor shall submit for approval to the Project Officer the proposed hourly rates and associated labor costs (benefits

and payroll burden) for all laborers and forepersons to be engaged in the work. The number of laborers and forepersons engaged in the work will be subject to regulation by the Project Officer and shall not exceed the number that the Project officer deems most practical and economical for the work. For all labor and forepersons in direct charge of the force account work, excluding general superintendence, compensation will be as follows:

1) Certified Pay Rate: The Contractor will receive the actual rate of wage or scale as set forth in his most recent payroll for each classification of laborers, and forepersons who are in direct charge of the specific operation. The time allowed for payment will be the number of hours such workers are actually engaged in the work. If overtime work is authorized by the County, payment will be at the normal overtime rate set forth in the Contractor's most recent payroll.

2) Benefits: The Contractor will be entitled to receive the actual cost for any fringe benefits that are regularly provided to the classes of laborers and forepersons engaged in the work and that are not included in the certified pay rate.

3) Payroll Burden: The Contractor will be entitled to receive the actual cost for all costs associated with required payroll taxes and payroll benefits not covered in 2) above, including:
    - Social Security Tax
    - Medicare Tax
    - Unemployment Tax
    - Worker's Compensation Insurance
    - Contractor's Public Liability Insurance
    - Contractor's Property Damage Liability Insurance

4) If the Contractor is unable to provide the necessary documentation for Benefits and Payroll Burden as identified above, the Contractor will be entitled to an additive of 20% of the Certified Hourly Pay Rate as full and final compensation for Benefits and Payroll Burdens

5) Overhead and Profit: The Contractor will be entitled to an additive of 10% on all properly documented and approved costs established in paragraphs 1), 2), 3), and 4) above for all administrative, overhead, and profit associated with labor costs.

6) Subsistence and lodging allowances may be allowed by the Project Officer at the actual and documented costs for lodging and meals if the following conditions are met and the applicable rates and authorization for such costs are established prior to beginning the work. No additives for overhead, administrative, profit, or any other costs will be permitted for subsistence and lodging.

    i. The specific Force Account work is outside the scope of the original contract, requires mobilization of a separate crew not intended to be used on the original contract, and the Contractor's base location is more than 50

miles from the work site, or

ii. Forces which have been working on the Contract will be used for the Force Account work and have been routinely staying overnight during the life of the Project, and the Force Account Work will warrant an extension of the contract time, and the distance from the Contractor's base location to the work site is more than 50 miles

b. Materials: The Contractor will receive the actual cost of materials accepted by the Project Officer that are delivered and used for the work including taxes, transportation, and handling charges paid by the Contractor, not including labor and equipment rentals as herein set forth, to which 15 percent (15%) of the cost will be added for administration and profit. The Contractor shall make every reasonable effort to take advantage of trade discounts offered by material suppliers. Any discount received shall pass through to the County. Salvageable temporary construction materials will be retained by the County, or their appropriate salvage value shall be credited to the County, at the County's discretion.

c. Equipment: For all equipment other than small tools, the Contractor will be entitled to rental rates as established herein and agreed to in writing before the work is begun. Transportation costs directly attributable to Force Account work will be as stated below. Small tools will be considered any equipment which has a new cost of $1000 or less and will not be eligible for any compensation. The Contractor shall provide the Project Officer a list of all equipment to be used in the work. For each piece of equipment, the list shall include the serial number; date of manufacture; location from which equipment will be transported; and, for rental equipment, the rental rate and name of the company from which it is rented. The number and types of equipment engaged in the work will be subject to regulation by the Project Officer as deemed to be the most practical and economical for the work. No compensation will be allowed for equipment which is inoperable due to mechanical failure. Compensation for equipment shall be as follows:

1) Hourly Base Equipment Rental Rates (Owned Equipment) – For equipment authorized for use in the Force Account work that is owned by the Contractor, the Contractor shall be entitled to an Hourly Base Rental Rate as detailed in the following paragraphs. The Hourly Base Rental Rate for Contractor owned equipment will not exceed 1/176 of the monthly rates of the schedule shown in the *Rental Rate Blue Book* modified in accordance with the *Rental Rate Blue Book* rate adjustment tables that are current at the time the force account is authorized. The rates for equipment not listed in the *Rental Rate Blue Book* schedule shall not exceed the hourly rate being paid for such equipment by the Contractor at the time of the force account authorization. In the absence of such rates, prevailing rates being paid in the area where the authorized work is to be performed shall be used.

2) Hourly Base Equipment Rental Rates (Rented Equipment) – If the Contractor does not possess or have readily available equipment necessary for performing the

force account work and such equipment is rented from a source other than a company that is an affiliate of the Contractor, payment will be based on actual invoice rates when the rates are reasonably in line with established rental rates for the equipment in question and are approved by the Project Officer.

3) Hourly Operating Rates – Hourly Operating Rates shall be as established in the Blue Book estimated operating cost per hour. This operating cost will be full compensation for fuel, lubricants, repairs, servicing (greasing, fueling, and oiling), small tools, and any and all incidentals. If rental rates for the equipment being used in the work are not listed in the Blue Book or otherwise readily available, the Hourly Operating Cost will be 15% of the established Hourly Base Rental Rate. If invoices for Rental Equipment include the furnishing of fuel, lubricants, repair, and servicing, then the Contractor will not be entitled to any Hourly Operating costs for that equipment.

4) Equipment Usage - Equipment usage will be measured by time in hours of actual time engaged in the performance of the work. The Contractor shall be entitled to the applicable Hourly Base Equipment Rental Rate and Hourly Operating Rate for all approved Equipment Usage.

5) Equipment Standby – Standby time is defined as the period of time equipment authorized for Force Account work by the Project Officer is available on-site for the work but is idle for reasons not the fault of the Contractor or normally associated with the efficient and necessary use of that equipment in the overall operation of the work at hand. Hourly rates for Contractor owned equipment on standby, will be at 50 percent (50%) of the rate paid for equipment performing work. Operating costs will not be allowed for equipment on Standby. When equipment is performing work less than 40 hours for any given week and is on standby, payment for standby time will be allowed for up to 40 hours, minus hours performing work. Payment for Standby will be allowed only for working days. Payment for Standby will not be made for the time that equipment is on the Project in excess of 24 hours prior to its actual performance in the force account work.

6) Transporting Costs – When it is necessary to obtain equipment exclusively for Force Account work from sources beyond the Project limits and the Project Officer authorizes the transporting of such equipment to the Project site, the cost of transporting the equipment will be allowed as an expense. Where the transport requires the use for a hauling unit, the allowable expense will consist only of the actual cost incurred for the use of the hauling equipment, or the applicable Blue Book cost, whichever is less. When equipment is transferred under its own power, the allowable Transporting cost shall be 50% of the Hourly Base Equipment Rental Rate.

7) Overhead and Profit – The Contractor shall be entitled to an additive of 10% on all appropriate and approved Equipment Rental, Operating, and Transporting

costs as defined above.

d. Subcontracting: The Contractor shall receive the cost of work performed by a subcontractor as determined in (a), (b), and (c) above. In addition, the Contractor will be allowed an allowance per the schedule below for administrative costs and profit.

Total Cost of Subcontract Work:	Rate Schedule
$0 - $10,000	10%
> $10,000	$1,000 + 5 % above $10,000

e. Other Costs: The Contractor shall not be entitled to any costs associated with Force Account Work other than those specifically identified in this section.

f. Statements: Payments will not be made for work performed on a force account basis until the Contractor has furnished the Project Officer duplicate itemized statements of all costs of such work detailed as follows:

1. Payroll indicating name, classification, date, daily hours, total hours, rate, and extension of each laborer, foreperson
2. Designation, dates, daily hours, total hours, rental rate, and extension for each unit of equipment
3. Quantities of materials, prices, and extensions
4. Transportation of materials
5. Statements shall be accompanied and supported by invoices for all materials used and transportation charges. However, if materials used on the Force Account work are not specifically purchased for such work but are taken from the Contractor's stock, then in lieu of the invoices, the Contractor shall furnish an affidavit certifying that such materials were taken from his stock; that the quantity claimed was actually used; and that the price, transportation, and handling claimed represented his actual cost.

9. CLAIMS FOR EXTRA COST

If the Contractor claims that any event will give rise to a claim for an increase in the Contract Amount or that any instructions from the Project Officer, by drawings or otherwise, will incur him extra cost under the Contract, then, except in emergencies endangering life or property, it shall give the Project Officer written notice thereof no later than three (3) days of the event or instruction. The Contractor thereafter must provide to the Project Officer a full cost proposal within 14 days detailing the amount of additional compensation claimed, together with the basis therefore and documentation supporting the claimed amount. No such claims shall be valid unless so made. If the Project Officer agrees that such event or instructions involve extra cost to the Contractor, any additional compensation will be determined by one of the methods provided in the Changes in Work paragraph of these General Conditions as selected by the Project Officer. All pricing and supporting documentation requirements of the Changes in the Work clause shall apply to claims for extra cost deemed valid under this paragraph.

10. DAMAGES FOR DELAY; EXTENSION OF TIME OTHER THAN FOR WEATHER

The Contractor's relief for any claim for delay which is unreasonable, or caused by the acts and omissions of the County, or due to causes within the County's control, shall be an extension of the Time for Completion and/or the Contractor's direct costs which result from the delay, but only to the extent any damages for delay were actually caused by the County. The Contractor must give the Project Officer written notice of such delay and damages at the time they were incurred but in no event later than three (3) calendar days following the perceived onset of the delay. The Contractor's written notice shall specify the nature the delay claimed by the Contractor, the cause of the delay, and the anticipated impact of the delay on the Contractor's work schedule. The Contractor thereafter must provide to the Project Officer a full claim within 14 days after cessation of the delay detailing the amount of additional contract time or compensation claimed, together with the basis therefor and documentation supporting the claim.

If the Contractor is entitled to compensation for delay which is unreasonable, or caused by the acts and omissions of the County, or due to causes within the County's control, and where there is no change in the Work, an itemized accounting of the following direct site overhead expenses will be considered as allowable costs to be used in determining the compensation due the Contractor: site superintendent prorata salary, temporary site office expense, temporary site facilities, and temporary site utilities including basic telephone service, electricity, heat, water, and sanitary/toilets. A fifteen percent (15%) markup of these expenses will be allowed to compensate the Contractor for home office and other direct or indirect overhead expenses.

If the Contractor submits a claim for damages pursuant to this Section, the Contractor shall be liable to the County for a percentage of all costs incurred by the County in investigating, analyzing, negotiating and litigating the claim, which percentage shall be equal to the percentage of the Contractor's total delay claim that is determined through litigation to be false or to have no basis in law or fact (Virginia Code §2.2-4335).

The Contractor's sole relief on any claims for delay which is reasonable, or not caused by the acts or omissions of the County, or due to causes not within the County's control, or Force Majeure, shall be an extension of the Time for Completion provided the Contractor gave the Project Officer timely written notice at the inception of such delay.

No extension of the Time for Completion or additional compensation, if applicable, will be granted for any delay unless the Contractor demonstrates the claimed delay directly impacts the Critical Path of the accepted CPM schedule or bar chart schedule, whichever is applicable, and any float has been consumed. Claims for compensation for direct costs which result from delay must be substantiated by adequate documentation clearly showing that the Work delayed was on the critical path of the approved CPM schedule or on the sequence of Work on the approved bar chart schedule, as modified, and that the additional costs incurred by the Contractor are directly attributable to the delay in the Work claimed.

11. TIME EXTENSIONS FOR WEATHER

The Contractor's sole relief on any claims for delay which is caused by abnormal weather shall be an extension of the Time for Completion provided the Contractor gave the Project Officer written notice no later than five (5) calendar days after the onset of such delay and provided the weather affected the Critical Path. A fully-documented claim for a time extension under this Section must be submitted no later than thirty (30) calendar days after the cessation of the delay. It shall be the Contractor's responsibility to provide the necessary documentation to satisfy the Project Officer that the weather conditions claimed were encountered, which may include daily reports by the Contractor, copies of notification of weather days to the Project Officer, NOAA backup, and pictures from each day claimed.

The Time for Completion will not be extended due to inclement weather conditions which are normal, as defined below, for Arlington County. The Time for Completion includes an allowance for workdays (based on five (5) day workweek) which according to historical data may not be suitable for construction work. The Contractor may request extension to the Time for Completion if it can demonstrate unusual and disruptive weather conditions per the requirements below:

a. That one or more of the Weather Conditions listed below was encountered; and,
b. The occurrence of the Weather Condition(s) resulted in an inability to prosecute work which would have otherwise been performed on the day(s) the Weather Condition(s) occurred; and,
c. The work which was not able to be completed was on the Critical Path and could not be completed ***only*** due to the Weather Condition(s) claimed.

The Project Officer will determine the Contractor's entitlement to an extension of the Time for Completion. A time extension of no more than one (1) day will be granted for one (1) day of lost work which satisfies the requirements above, regardless of the number of Weather Conditions encountered. The Contractor's sole relief shall be an extension of the Time for Completion and no claim for an increase in Contract Amount will be allowed.

The Weather Conditions listed below will be the only basis for consideration by the County, based upon the requirements listed above, as an extension of the Time for Completion due to inclement weather or weather-related site conditions.

Weather Condition #1: Unusually Heavy Precipitation - Figure 1 illustrates the anticipated monthly inclement weather due to precipitation (Rain Days). If the number of days with precipitation in excess of 0.10", as recorded at Washington Reagan National Airport, exceeds the anticipated Rain Days, the Contractor will be entitled to an extension of one (1) day on the Time for Completion for every day in excess of the Rain Days illustrated in Figure 1. The anticipated value of Rain Days for partial months at the beginning and end of the Contract shall be evaluated on a pro-rated basis.

FIGURE 1

Average days with precipitation of 0.1" or more

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
7	6	7	6	8	6	7	6	6	5	6	6

Weather days are not exclusive to the individual months that they represent in Figure 1. If weather days are not used in a previous month(s) they can be used to offset weather delays in subsequent months. This will be reviewed on a case by case basis and is subject to reconciliation at the end of the Project.

Condition #2: Temperature – The Contractor may be entitled to an additional day for every day that the recorded high temperature at Washington Reagan National Airport is 32 degrees Fahrenheit or less, that has not already been incurred under Weather Condition #1 above. This condition does not apply to vertical construction as defined by the Arlington County Vertical Construction Standards.

12. RELEASE OF LIENS

The County, before making final payment, shall require the Contractor to furnish a complete release of all liens arising out of this Contract. The Contractor may, if any subcontractor refuses to furnish a release or receipt in full, furnish a bond satisfactory to the County, to indemnify him against any lien. If any lien remains unsatisfied after all payments have been made, the Contractor shall refund to the County all money that the latter may be compelled to pay in discharging such lien. However, the County may make payments in part or in full to the Contractor without requiring the releases or receipts, and the payments so made shall not impair the obligations of any Surety or Sureties on any bond or bonds furnished under this Contract.

13. FINAL PAYMENT

After the Contractor has completed all work and corrections to the satisfaction of the Project Officer or designee and delivered all maintenance and operating instructions, schedules, quantities, bonds, certificates of inspection maintenance record documents, and other items required as final payment submittal documents, the Contractor may make application for final payment following the procedure for progress payments. The Final Application for Payment shall be accompanied by all documents required in the Contract, including a complete and signed and notarized copy of the Final Payment Release Form as follows:

RELEASE AND REQUEST FOR FINAL PAYMENT

CONTRACT NUMBER: _____ CONTRACTOR NAME:_____

FINAL PAYMENT AMOUNT:_____

The Contractor hereby requests final payment in the amount indicated on the above referenced Contract. The Contractor agrees that its acceptance of final payment releases and forever discharges Arlington County and its officers, employees, servants and agents from any and all actions, claims, demands and liability of whatever nature now existing or which may hereafter arise as a result of or in connection with the above referenced Contract.

The Contractor certifies that all of the debts for labor, materials, and equipment incurred in connection with the above referenced Contract have been fully paid.

AUTHORIZED SIGNATURE DATE: _____

The date of Final Acceptance is the date on which the County issues the final payment for the work performed.

COMMONWEALTH OF VIRGINIA

COUNTY OF ARLINGTON

On this the _____ day of _____, 20___, before me, personally appeared _____, who acknowledged himself/herself to be _____ in the above instrument, and that he/she, as such _____, being authorized so to do, executed the foregoing instrument for the purposes therein contained, by signing his/her name by himself/herself as _____.

IN WITNESS WHEREOF, I hereunto set my hand and official seal.

_____
Notary Public

My Commission Expires: _____

IV. INSURANCE REQUIREMENTS

Review this section carefully with your insurance agent or broker prior to submitting a bid or proposal. See the Insurance Checklist (part of the Bid or Proposal Forms) for specific coverages applicable to this Contract. The term "Contract," as used in this section, shall mean the fully executed Agreement covering the work entered into between the County and the Contractor.

1. General

1.1 The Contractor shall provide insurance as specified in the Insurance Checklist found on the last page of the bid or proposal form.

1.2 The Contract with the Contractor will not be executed by the County until the Contractor has obtained, at its own expense, all of the insurance called for hereunder and such insurance has been approved by the County; additionally, the Contractor shall not allow any subcontractor to start work on any subcontract until all insurance required of the subcontractor has been so obtained and approved by the Contractor. The Contractor shall submit to the County Purchasing Agent copies of all required endorsements and documentation of coverage consistent with the requirements herein or, alternately, at the County's request, certified copies of the required insurance policies in compliance with the insurance requirements. All endorsements and documentation shall state this Contract's number and title.

1.3 The Contractor shall require all subcontractors to maintain during the term of this Agreement, Commercial General Liability insurance, Business Automobile Liability insurance, and Workers' Compensation, Employers' Liability insurance, or any other insurance required by the Contract in the same manner and form as specified for the Contractor. The Contractor shall furnish subcontractors' evidence of insurance and copies of endorsements to the County Purchasing Agent immediately upon request by the County and/or prior to the subcontractor's performance of work related to this Contract.

1.4 If there is a material change or reduction in coverage, nonrenewal of any insurance coverage or cancellation of any insurance coverage required by this contract, the Contractor shall notify the Purchasing Agent immediately. It is the Contractor's responsibility to notify the County upon receipt of a notice indicating that the policy will not be renewed or will be materially changed. Any policy on which the Contractor has received notification from an insurer that the policy has or will be cancelled or materially changed or reduced must be immediately replaced with another policy consistent with the terms of this Contract and in such a manner that there is no lapse in coverage, and the County immediately notified of the replacement. Not having the required insurance throughout the Contract is considered a material breach of this Contract and grounds for termination. The Contractor shall also obtain an endorsement providing to the County thirty (30) days advance notice of cancellation or nonrenewal (ten days for nonpayment of premium. A copy of that endorsement shall be provided to the County Purchasing Agent prior to the execution of this Contract or any Contract extension thereafter.

1.5 No acceptance and/or approval of any insurance by the County shall be construed as relieving or excusing the Contractor, any surety, or any bond, from any liability or obligation imposed under this Agreement.

1.6 Arlington County, and its officers, elected and appointed officials, employees, and agents are to be named as additional insureds under all coverages except Workers' Compensation, Professional Liability, and Automobile Liability, and the endorsement must clearly identify the County as an additional insured permitted to enjoy all the benefits under the applicable policy of insurance. The certified policy, if requested, must so state coverage afforded under this paragraph shall be primary as respects the County, its officers, elected and appointed officials, agents and employees. The following definition of the term "County" applies to all policies issued under the Contract and to all applicable endorsements:

> "The County Board of Arlington County and any affiliated or subsidiary Board, Authority, Committee, or Independent Agency (including those newly constituted), provided that such affiliated or subsidiary Board, Authority, Committee, or Independent Agency is either a Body Politic created by the County Board of Arlington County, Virginia, or one in which controlling interest is vested in Arlington County; and Arlington County Constitutional Officers."

1.7 The Contractor shall be responsible for the work performed under the Contract Documents and every part thereof, and for all materials, tools, equipment, appliances, and property of any description used in connection with the work. The Contractor assumes all risks for direct and indirect damage or injury to the property or persons used or employed on or in connection with the Work contracted for, and of all damage or injury to any person or property wherever located, resulting from any action, omission, commission or operation under the Contract, or in connection in any way whatsoever with the contracted work.

1.8 The insurance coverage required shall remain in force throughout the Contract or as otherwise stated in the Contract Documents or these Insurance Requirements. If the Contractor fails to provide acceptable evidence of current insurance within seven (7) days of written notice at any time during the Contract, the County shall have the absolute right to terminate the Contract without any further obligation to the Contractor.

1.9 Contractual and other liability insurance provided under this Contract shall not contain a supervision, inspection or engineering services exclusion that would preclude the County from supervising or inspecting the work as to the end result. The Contractor shall assume all on-the-job responsibilities as to the control of persons directly employed by it and of the subcontractors and any persons employed by the subcontractor and/or carriers delivering and receiving materials from the Project.

1.10 If any policy contains a warranty stating that coverage is null and void (or words to that effect) if the Contractor does not comply with the most stringent regulations governing the work, such policy shall be modified so that coverage shall be afforded in all cases except for the Contractor's willful or intentional noncompliance with applicable government regulations.

1.11 All policies shall include the following language: "The insolvency or bankruptcy of the insured or of the insured's estate will not relieve the insurance company of its obligations under this policy."

1.12 All policy forms must "Pay on behalf of" rather than "Indemnify" the insured.

1.13 Nothing contained in these Insurance Requirements or the Contract Documents shall be construed as creating any contractual relationship between any subcontractor and the County. The Contractor shall be as fully responsible to the County for the acts and omissions of its subcontractors and of persons employed by them as it is for acts and omissions of persons directly employed by it.

1.14 Precaution shall be exercised by the Contractor at all times for the protection of persons, (including employees) and property. All existing structures, utilities, roads, services, trees and shrubbery shall be protected against damage or interruption of service at all times by the Contractor and its subcontractors during the term of the Contract, and the Contractor shall be held responsible for any damage to property occurring by reason of its work under the Contract whether identified on the Contract Documents or not.

1.15 For any claims related to this work, The Contractor's insurance shall be deemed primary and non-contributory to all other applicable coverage and in particular with respect to Arlington County, its representatives, officials, employees, and agents. Any insurance or self-insurance maintained by Arlington County shall be excess and noncontributory of the Contractor's insurance. The Contractor shall waive its right of subrogation for all insurance claims.

1.16 If the Contractor does not meet the insurance requirements set forth by the Contract Documents, alternate insurance coverage or self-insurance, satisfactory to the Purchasing Agent, may be considered. Written requests for consideration of alternate coverages including the Contractor's most recent actuarial report and a copy of its self-insurance resolution to determine the adequacy of the insurance funding must be received by the County Purchasing Agent at least ten (10) working days prior to the date set for receipt of bids or proposals. If the County denies the request for alternate coverages, the specified coverages will be required to be submitted. If the County permits alternate coverage, an Addendum to the Insurance Requirements will be prepared and distributed prior to the time and date set for receipt of bids or proposals.

1.17 All required insurance coverages must be acquired from insurers authorized to do business in the Commonwealth of Virginia and acceptable to the County. The insurers must also have a policyholders' with a rating of "A-VII" in the latest edition of the A.M. Best Co.'s Insurance Reports, unless the County grants specific approval for an exception, in the same manner as described in 1.16 above.

1.18 The Contractor shall be responsible for payment of any deductibles applicable to the coverages.

1.19 The Contractor must disclose the amount of any deductible or self-insurance component applicable to the General Liability, Automobile Liability, Professional Liability, Intellectual Property or any other policies, if any. The County reserves the right to request additional information to determine if the Contractor has the financial capacity to meet its obligations under a deductible. Thereafter, at its option, the County may require a lower deductible, funds equal to the deductible be placed in escrow, a certificate of self-insurance, collateral, or other mechanism in the amount of the deductible to ensure additional protection for the County.

2. Contractor's Insurance:

2.1 The Contractor shall purchase the following insurance coverages, including the terms, provisions and limits shown in the Insurance Checklist.

2.1.1 Commercial General Liability - Such Commercial General Liability policy shall include any or all of the following as indicated on the Checklist:

i. General aggregate limit is to apply per project;

ii Premises/Operations;

iii. Actions of Independent Contractors;

iv. Products/Completed Operations to be maintained for five (5) years after completion of the Work;

v. Contractual Liability, including protection for the Contractor from claims arising out of liability assumed under this Contract;

vi. Personal Injury Liability including, including but not limited to, coverage for offenses related to employment and copyright infringement;

vii. Explosion, Collapse, or Underground (XCU) hazards.

2.1.2 Business Automobile Liability, including coverage for any owned, hired, or non-owned motor vehicles, Uninsured Motorists coverage, and automobile contractual liability.

2.1.3 Workers' Compensation - statutory benefits as required by Virginia law or the U.S. Longshoremen's and Harbor Workers' Compensation Act, or other laws as required by labor union agreements, including standard Other States coverage; Employers' Liability coverage. The policy shall not contain any provision or definition which would serve to eliminate third party action over claims, including exclusion for bodily injury to an employee of the insured, employees of the premises owner, or employees of the general contractor to which the insured is subcontracted; or employees of the insured’s subcontractor.

2.2 The Contractor shall take reasonable precautions for the safety of, and shall provide all reasonable protection to prevent damage, injury or loss to, its employees on the job, and others. The Contractor shall comply with all applicable provisions of federal, state and municipal safety laws, insurance requirement’s, standard industry practices, the requirements of the operations and this contract, the Contractor, directly through its subcontractors, shall effect and properly maintain at all times, as required by the conditions and progress of the work, necessary safeguards for safety and protection of the public, including securing areas, posting danger signs, placarding, labeling or posting other forms of warning against hazards.

3. Commercial General or other Liability Insurance - Claims-made Basis:

3.1 If Commercial General or other liability insurance purchased by the Contractor has been issued on a claims-made basis, the Contractor must comply with the following additional conditions. The limits of liability and the extensions to be included as described in the Insurance Checklist remain the same. The Contractor must either:

i. Agree to provide insurance, copies of the endorsement and certified documentation evidencing the above coverages and naming the County as an additional insured for a period of five (5) years after final payment under the Contract. Such documentation shall evidence a retroactive date, no later than the beginning of the Contractors or subcontractors' work under this Contract, or

ii. Purchase an extended (minimum five [5] years) reporting period endorsement for the policy or policies in force during the term of this Contract and evidence the purchase of this extended reporting period endorsement by means of a copy of the endorsement itself. The extended reporting period will begin upon final payment under the Contract.

4. Builder's Risk Insurance

4.1 The Contractor shall purchase and maintain builders risk insurance with a limit equal to the initial Contract Amount and any amendments to the Contract which affect the project cost on a replacement cost basis. Builder's risk insurance shall be maintained until Final Payment under the Contract has been made or until no person or entity other than the County has an insurable interest in the covered property, whichever is earlier. The builders risk insurance shall include the County as defined in Section 1.6, Contractor, subcontractors and sub-subcontractors as named insureds.

4.2 Insurance shall be on an all-risks policy form including the perils of fire, theft, vandalism, malicious mischief, lightning, wind, force majeure, collapse, and earthquake. Coverage is to apply for demolition occasioned by enforcement of any applicable legal requirements, and Architect's fees. Coverage for the peril of flood shall not be required unless otherwise required in the Contract Documents.

4.3 Unless otherwise provided in the Contract Documents, the builders risk insurance shall also cover materials to be incorporated into the project which are stored off the site.

4.4 The Contractor shall purchase and maintain Boiler and Machinery insurance, if required by the contract documents or by law, with a limit satisfactory to the County. The Boiler and Machinery insurance shall cover objects during installation and until Final Acceptance by the County. The County shall be included as a named insured.

4.5 Any loss under builder's risk insurance shall be payable to the County as fiduciary for the insureds, as their interests may appear, subject to any mortgagee clause. The Contractor shall pay subcontractors their just shares of insurance proceeds received by the Contractor, and by appropriate agreements, written where legally required for validity, shall require subcontractors to make payments to their sub-subcontractors in similar manner. The County, as fiduciary, shall have the right to adjust and settle a loss with insurers.

4.6 The insurance company providing the builders risk coverage shall grant permission for the County to partially occupy or use the premises under construction prior to final acceptance without removing or affecting the coverage.

V. ATTACHMENTS AND FORMS

ARLINGTON COUNTY, VIRGINIA
OFFICE OF THE PURCHASING AGENT

INVITATION TO BID NO. 21-CPHD-ITB-271

B I D F O R M

ELECTRONIC BIDS WILL BE RECEIVED BY THE COUNTY VIA VENDOR REGISTRY NOT LATER THAN 3:00 P.M., OCTOBER 29TH, 2020.

FOR PROVIDING CONSTRUCTION SERVICES IDENTIFIED HEREIN IN ACCORDANCE WITH THE DRAWINGS, SPECIFICATIONS, TERMS AND CONDITIONS OF THIS SOLICITATION

THE FULL LEGAL NAME OF THE ENTITY SUBMITTING THIS BID MUST BE WRITTEN IN THE SPACE BELOW. THIS BID FORM AND ALL OTHER DOCUMENTS THAT REQUIRE A SIGNATURE MUST BE FULLY AND ACCURATELY COMPLETED AND SIGNED BY A PERSON WHO IS AUTHORIZED TO BIND THE BIDDER, OR THE BID MAY BE REJECTED.

SUBMITTED BY:
(legal name of entity) _____

AUTHORIZED SIGNATURE: _____

PRINT NAME AND TITLE: _____

ADDRESS: _____

CITY/STATE/ZIP: _____

TELEPHONE NO.: _____ **E-MAIL ADDRESS:** _____

THIS ENTITY IS INCORPORATED IN: _____

THIS ENTITY IS A:
(check the applicable option)

CORPORATION	❑	LIMITED PARTNERSHIP	❑
GENERAL PARTNERSHIP	❑	UNINCORPORATED ASSOCIATION	❑
LIMITED LIABILITY COMPANY	❑	SOLE PROPRIETORSHIP	❑

IS BIDDER AUTHORIZED TO TRANSACT BUSINESS IN THE COMMONWEALTH OF VIRGINIA? YES ❑ NO ❑

IDENTIFICATION NO. ISSUED TO THE ENTITY BY THE SCC: _____

Any Bidder exempt from Virginia State Corporation Commission (SCC) authorization requirement must include a statement with its bid explaining why it is not required to be so authorized.

VIRGINIA CONTRACTOR'S LICENSE NUMBER: _____

ENTITY'S DUN & BRADSTREET D-U-N-S NUMBER: *(if available)*

HAS YOUR FIRM OR ANY OF ITS PRINCIPALS BEEN DEBARRED FROM SUBMITTING BIDS TO ARLINGTON COUNTY, VIRGINIA, OR ANY OTHER STATE OR POLITICAL SUBDIVISION WITHIN THE PAST THREE YEARS?	YES	❑	NO	❑
HAS YOUR FIRM DEFAULTED ON ANY PROJECT IN THE LAST THREE YEARS?	YES	❑	NO	❑
HAS YOUR FIRM HAD ANY TYPE OF BUSINESS, CONTRACTING OR TRADE LICENSE, REGISTRATION OR CERTIFICATION REVOKED OR SUSPENDED IN THE PAST THREE YEARS?	YES	❑	NO	❑
HAS YOUR FIRM AND ITS PRINCIPALS/OWNERS BEEN CONVICTED OF ANY CRIME RELATING TO ITS CONTRACTING BUSINESS IN THE PAST TEN YEARS?				
HAS YOUR FIRM BEEN FOUND IN VIOLATION OF ANY LAW APPLICABLE TO ITS CONTRACTING BUSINESS (LICENSING LAWS, TAX LAWS, WAGE AND HOUR LAWS, PREVAILING WAGE LAWS, ENVIRONMENTAL) WHERE THE RESULT OF SUCH VIOLATION WAS THE PAYMENT OF A FINE, BACK PAY DAMAGES, OR ANY OTHER PENALTY IN THE AMOUNT OF $5000 OR MORE?	YES	❑	NO	❑

BIDDER STATUS: MINORITY OWNED: ❑ WOMAN OWNED: ❑ NEITHER: ❑

The undersigned certifies that (Bidder Name)_____
is currently registered with the Virginia State Board of Contractors as required by the Code of Virginia. Certificate Number_____ for a Class_____ License was issued on the_____day of _____, 20____. The undersigned further certifies that the registration fee and all renewal fees required under law have been paid.

TIME LIMIT FOR PROJECT: SUBSTANTIAL COMPLETION – __240___ **CALENDAR DAYS**
FINAL COMPLETION – ___90___ **CALENDAR DAYS** FROM SUBSTANTIAL COMPLETION

LIQUIDATED DAMAGES: SUBSTANTIAL COMPLETION - **$____1758.00** PER DAY
FINAL COMPLETION - **$_____1758.00** PER DAY

MINIMUM BIDDER QUALIFICATIONS:
In a separate attachment, Bidders shall provide the following documentation:

COMPANY QUALIFICATIONS:

Proof of three (3) years of experience conducting public works infrastructure and street improvement projects in an urban environment. The experience shall be work of similar size and scope, construction, re-construction, and maintenance. The Bidder's obtained project experience shall consist of the following:

- State and County streets
- Curbs and gutters
- Sidewalks and walkways
- Driveway aprons
- Storm sewer pipes and inlets
- Wet Utilities
- Pavement markings and signage
- Streetscapes and related site work

- List of five (5) similar projects recently completed projects that involving the same material, equal size, and comparable length. For each project, Bidders shall list the following information:
  - Project Name
  - Project description and Bidder's scope of work within the project
  - Project manager's name, telephone number and email address
  - Work start date, scheduled completion, and actual completion date
  - Initial contract cost and final contract cost

STAFFING QUALIFICATIONS:

Bidders shall have at least one (1) employee certified by VDOT in Basic Work Zone Traffic Control and shall have at least one (1) employee certified in OSHA 10. Bidders shall submit copy of these certificates with their bids.

COMPLETE THE PRICING SHEET PROVIDED WITH THE BID DOCUMENTS AS ATTACHMENT A TO ITB NO. 21-CPHD-ITB-271 AND SUBMIT IT WITH YOUR BID.

FAILURE TO SUBMIT THE PRICING SHEET WITH THE BID WILL DEEM THE BIDDER NONRESPONSIVE.

STIPULATED PRICE ITEMS

The Contractor agrees to perform related work for the following items at the stipulated prices shown:

#	ITEM DESCRIPTION	UNIT	QTY
1	CONCRETE PIER, CRADLE, OR ENCASEMENT	CY	$200.00
2	ROCK EXCAVATION	CY	$150.00
3	CRUSHER RUN VDOT #25 OR APPROVED EQUAL	CY	$100.00
4	OVER EXCAVATION	CY	$65.00
5	TEST PITS	EA	$550.00
6	SELECT BORROW	CY	$70.00
7	ADDITIONAL ROOT PRUNING	LF	$25.00

THE UNDERSIGNED UNDERSTANDS AND ACKNOWLEDGES THE FOLLOWING:

THE OFFICIAL COPY OF THE SOLICITATION DOCUMENTS, WHICH INCLUDES ANY ADDENDA, IS THE ELECTRONIC COPY THAT IS AVAILABLE FROM THE VENDOR REGISTRY WEBSITE AT: HTTPS://VRAPP.VENDORREGISTRY.COM/BIDS/VIEW/BIDSLIST?BUYERID=A596C7C4-0123-4202-BF15-3583300EE088.

VENDORS ARE REQUIRED TO REGISTER ON VENDOR REGISTRY IN ORDER TO SUBMIT A RESPONSE TO THIS INVITATION TO BID. **NO RESPONSES WILL BE ACCEPTED AFTER THE BID DUE DATE AND TIME**.

POTENTIAL BIDDERS ARE RESPONSIBLE FOR DETERMINING THE ACCURACY AND COMPLETENESS OF ALL SOLICITATION DOCUMENTS THEY RECEIVE FROM ANY SOURCE, INCLUDING THE COUNTY.

The undersigned acknowledges receipt of the following Addenda:

ADDENDUM NO. 1 DATE:_____ INITIAL:_____

ADDENDUM NO. 2 DATE:_____ INITIAL:_____

ADDENDUM NO. 3 DATE:_____ INITIAL:_____

TRADE SECRETS OR PROPRIETARY INFORMATION:
Trade secrets or proprietary information submitted by a Bidder in connection with a procurement transaction will not be subject to public disclosure under the Virginia Freedom of Information Act. Pursuant to Section 4-111 of the Arlington County Purchasing Resolution, however, a Bidder seeking to protect submitted data or materials from disclosure must, before or upon submission of the data or materials, identify the data or materials to be protected and state the reasons why protection is necessary.

Please mark one:

❑ No, the bid that I have submitted does not contain any trade secrets and/or proprietary information.

❑ Yes, the bid that I have submitted does contain trade secrets and/or proprietary information.

If Yes, you must clearly identify below the exact data or materials to be protected and list all applicable page numbers, sections, and paragraphs of the bid that contain such data or materials:

_____

_____

_____

State the specific reason(s) why protection is necessary and why the identified information constitutes a trade secret or is proprietary:

_____

_____

_____

_____

If you fail above to identify the data or materials to be protected or to state the reason(s) why protection is necessary, you will not have invoked the protection of Section 4-111 of the Purchasing Resolution. Accordingly, upon the award of a contract, the bid will be open for public inspection consistent with applicable law.

CERTIFICATION OF NON-COLLUSION: The undersigned certifies that this bid is not the result of or affected by (1) any act of collusion with another person engaged in the same line of business or commerce (as defined in Virginia Code §§ 59.1-68.6 *et seq*.) or (2) any act of fraud punishable under the Virginia Governmental Frauds Act (Virginia Code §§ 18.2-498.1 *et seq*.).

CONTACT PERSON AND MAILING ADDRESS FOR DELIVERY OF NOTICES

Provide the name and address of the person who is designated to receive notices and other communications regarding this solicitation. Refer to the "Notices" section in the draft Contract Terms and Conditions for information regarding delivery of notices.

NAME: _____

ADDRESS: _____

_____

E-MAIL: _____

REFERENCES

Bidders should provide _3_ references for similar goods that have been provided by the Bidder within the past _3_ years. The County reserves the right to evaluate the quality of Contractor's work through site visits with Contractor's references.

REFERENCE 1: Contact Name:_____

Organization: _____

Phone Number:_____

E-mail Address:_____

Contract/Project Name:_____

Contract/Project Dates (from-to):_____

Contract/Project Description:_____

_____

REFERENCE 2: Contact Name:_____

Organization: _____

Phone Number:_____

E-mail Address:_____

Contract/Project Name:_____

Contract/Project Dates (from-to):_____

Contract/Project Description:_____

_____

REFERENCE 3: Contact Name:_____

Organization: _____

Phone Number:_____

E-mail Address:_____

Contract/Project Name:_____

Contract/Project Dates (from-to):_____

Contract/Project Description:_____

_____

BIDDER NAME: _____

INSURANCE CHECKLIST

CERTIFICATE OF INSURANCE MUST SHOW ALL COVERAGE AND ENDORSEMENTS MARKED "X".

COVERAGES REQUIRED **COVERAGE MINIMUM(S)**

_X_1. Workers' Compensation .....Statutory limits of Virginia
__2. Employer's Liability ..... $100,000 accident, $100,000 disease, $500,000 disease policy limit
_X_3. Commercial General Liability.....$1,000,000 CSL BI/PD each occurrence, $2 Million annual aggregate
__4. Premises/Operations .....$500,000 CSL BI/PD each occurrence, $1 Million annual aggregate
_X_5. Automobile Liability.....$1 Million BI/PD each accident, Uninsured Motorist
__6. Owned/Hired/Non-Owned Vehicles.....$1 Million BI/PD each accident, Uninsured Motorist
__7. Independent Contractors .....$500,000 CSL BI/PD each occurrence, $1 Million annual aggregate
__8. Products Liability.....$500,000 CSL BI/PD each occurrence, $1 Million annual aggregate
__9. Completed Operations.....$500,000 CSL BI/PD each occurrence, $1 Million annual aggregate
__10. Contractual Liability (Must be shown on Certificate) .....$500,000 CSL BI/PD each occurrence, $1 Million annual aggregate
__11. Personal and Advertising Injury Liability..... $1 Million each offense, $1 Million annual aggregate
_X_12. Umbrella Liability..... $1 Million Bodily Injury, Property Damage and Personal Injury
_X_13. Per Project Aggregate
__14. Professional Liability
_a. Architects and Engineers ..... $1 Million per occurrence/claim
_b. Asbestos Removal Liability ..... $2 Million per occurrence/claim
_c. Medical Malpractice ..... $1 Million per occurrence/claim
_d. Medical Professional Liability ..... $ Limits as set forth in Virginia Code 8.01.581.15
__15. Miscellaneous E&O ..... $1 Million per occurrence/claim
__16. Motor Carrier Act End. (MCS-90).....$1 Million BI/PD each accident, Uninsured Motorist
__17. Motor Cargo Insurance
__18. Garage Liability ..... $1 Million Bodily Injury, Property Damage per occurrence
__19. Garagekeepers Liability ..... $500,000 Comprehensive, $500,000 Collision
__20. Inland Marine-Bailee's Insurance ..... $_____
__21. Moving and Rigging Floater .....Endorsement to CGL
__22. Crime and Employee Dishonesty Coverage ..... $_____
_X_23. Builder's Risk..... Provide Coverage in the full amount of Contract, including any amendments
_X_24. XCU Coverage .....Endorsement to CGL
__25. USL&H ..... Federal Statutory Limits
__26. Carrier Rating shall be A.M. Best Co.'s Rating of A-VII or better or equivalent
__27. Notice of Cancellation, nonrenewal or material change in coverage shall be provided to County at least 30 days prior to action.
__28. The County shall be an Additional Insured on all policies except Workers Compensation and Auto and Professional Liability.
__29. Certificate of Insurance shall show Bid Number and Bid Title.
__30. OTHER INSURANCE REQUIRED: _____

INSURANCE AGENT'S STATEMENT:

I have reviewed the above requirements with the bidder named below and have advised the bidder of required coverages not provided through this agency.

AGENCY NAME:_____ AUTH. SIGNATURE:_____

BIDDER'S STATEMENT:
If awarded the Contract, I will comply with all Contract insurance requirements.

BIDDER NAME:_____ AUTH. SIGNATURE:_____

ARLINGTON COUNTY, VIRGINIA
OFFICE OF THE PURCHASING AGENT
INVITATION TO BID NO. 21-CPHD-ITB-271
PROJECT NO.: Z261

THE UNDERSIGNED CERTIFIES THAT (CONTRACTOR NAME)_____
IS CURRENTLY REGISTERED WITH THE VIRGINIA STATE BOARD OF CONTRACTORS AS REQUIRED BY THE CODE OF VIRGINIA. CERTIFICATE NUMBER _____ WAS ISSUED ON THE _____DAY OF _____, 20XX. THE UNDERSIGNED FURTHER CERTIFIES THAT THE REGISTRATION FEE AND ALL RENEWAL FEES REQUIRED UNDER LAW HAVE BEEN PAID. THE CONTRACTOR AGREES TO FURNISH ALL NECESSARY LABOR, EQUIPMENT, MATERIALS, AND ALL THINGS NECESSARY TO PERFORM THE WORK AS SET FORTH IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS. THE CONTRACTOR AGREES TO PERFORM RELATED WORK FOR THE FOLLOWING ITEMS AT THE FOLLOWING STIPULATED PRICES: (ALL PRICES INCLUDE PROVISION AND INSTALLATION).

MASTER ITEM #	DESCRIPTION	QTY	UNIT	UNIT PRICE	TOTAL
C1	**GENERAL EARTH WORK**				
MASTER ITEM #	**DESCRIPTION**	**QTY**	**UNIT**	**UNIT PRICE**	**TOTAL**
02200-C1-00050	Select Borrow (VDOT Section 207 - Select Material, Type I)	70	CY		$0.00
02200-C1-00130	Aggregate, VDOT #21-A (Compacted in Place per VDOT standards & Specs)	480	CY		$0.00
				SUBTOTAL	**$0.00**

C2	**CONCRETE WORK**				
MASTER ITEM #	**DESCRIPTION**	**QTY**	**UNIT**	**UNIT PRICE**	**TOTAL**
02750-C2-00020	Concrete Curb, Standard Header Curb C-3 (Arlington County Detail R-2.0), includes curb for aprons, ramps, etc.	125	LF		$0.00
02750-C2-00060	Concrete Curb & Gutter, Standard C-2 and C-2R (Arlington County Detail R-2.0), includes curb & gutter for aprons, ramps, etc.	1400	LF		$0.00
02611-C2-00110	Concrete Sidewalk, 4" Thickness (Arlington County Detail R-2.0)	371	SY		$0.00
02611-C2-00190	CG-12 Detectable Warning Surface - Truncated Domes	12	SY		$0.00
02611-C2-00170	Concrete Driveway Entrance, 6" Thick Residential (Arlington County Details R-2.4A, R-2.4B, R-2.4C, R-2.4D)	165	SY		$0.00
03100-C2-00200	Concrete Steps Each (Arlington County Detail R-3.0, including all reinforcing bars as shown in detail)	6	LF-W		$0.00
				SUBTOTAL	**$0.00**

C3	**ASPHALT WORK**				
MASTER ITEM #	**DESCRIPTION**	**QTY**	**UNIT**	**UNITPRICE**	**TOTAL**
02600-C3-00030	Asphalt Concrete, Base Course (VDOT BM-25.0A)	630	TON		$0.00
02600-C3-00060	Asphalt Concrete, Surface Course (VDOT SM-9.5A) For Asphalt Driveway only.	11	TON		$0.00
				SUBTOTAL	**$0.00**

C6	**WATERMAIN WORK**				
MASTER ITEM #	**DESCRIPTION**	**QTY**	**UNIT**	**UNITPRICE**	**TOTAL**
02550-C6-00670	Water Meter Relocations - - 3/4-inch and 1-inch (INSTALL COPPER TUBING, CONNECT TO EXISTING COUNTY AND PRIVATE SERVICE LINES, PROVIDE NEW ANGLE VALVES, RELOCATE METER HOUSING AND METER YOKE, BACKFILL AND EXCAVATION)--UP TO 10 FT.	7	EA		$0.00
02550-SP-00010	Adjust Water Manhole to New Grade	1	LF		$0.00
02550-SP-00020	Spiked Water Meter Cover for Water Meters Cast in Concrete, Per Detail on Sheet C051.1	9	EA		$0.00
				SUBTOTAL	**$0.00**

C10	**PAVEMENT MARKING AND SIGNAGE WORK**				
MASTER ITEM #	**DESCRIPTION**	**QTY**	**UNIT**	**UNITPRICE**	**TOTAL**

02900-C10-00050	Twenty Four (24) Inch Transverse Markings, Note: Used For Continental (Ladder) Crosswalk	64	LF		$0.00
02900-C10-00410	Traffic Control Sign (Typical Stop, Yield, No Parking, Speed Limit, or Similar), Install per Detail SG-1.0	5	EA		$0.00
02900-C10-00430	Traffic Control Sign (Typical Stop, Yield, No Parking, Speed Limit, or Similar), Relocate with New Post	4	EA		$0.00
				SUBTOTAL	**$0.00**

C11 **LANDSCAPE AND HARDSCAPE RESTORATION WORK**

MASTER ITEM #	DESCRIPTION	QTY	UNIT	UNITPRICE	TOTAL
02200-C11-00010	Imported Topsoil	105	CY		$0.00
02800-C11-00030	Topsoil for Street Trees, Purchased Mixture (per Arlington County DPR Specification and Special Condition 21 Tree Pits)	25	CY		$0.00
02801-C11-00060	Sod, Tall Fescue/Bluegrass Mixture	950	SY		$0.00
02800-C11-00500	Tree/Stump Removal - Class A. Remove and Dispose, Up to 6" DBH to 12" DBH (Diameter at Breast Height)	11	EA		$0.00
02800-C11-00110	Brick Pavers, Remove and Reset (Arlington County Detail R-2.1)	18	SY		$0.00
02800-C11-00120	Flagstone Walkway, Remove & Reset or Replace to Match Existing	24	SY		$0.00
02800-SP-00030	Wooden or Vinyl Fence (Typical Privacy, Picket, or Similar), Reset or Replace to Match Existing	300	LF		$0.00
02800-SP-00040	Metal Fence, Remove and Reset, at 101 N Highland St.	30	LF		$0.00
				SUBTOTAL	**$0.00**

C13 **EROSION AND SEDIMENT CONTROL WORK**

MASTER ITEM #	DESCRIPTION	QTY	UNIT	UNITPRICE	TOTAL
01500-C13-10000	Temporary Erosion and Sediment Controls	1	LS		$0.00
				SUBTOTAL	**$0.00**

CONTRACT TOTAL (EXCLUDING PERCENTAGE ITEMS)	**$0.00**

PCT **PERCENTAGE LINE ITEMS**

MASTER ITEM #	DESCRIPTION	QTY	UNIT	UNITPRICE	TOTAL
01000-C16-00010	Maintenance of Traffic (MOT)	NA	%		**$0.00**
01000-C16-00030	Mobilization and De-Mobilization	NA	%		**$0.00**
01500-SA-00200	SWPPP Administration	NA	%		**$0.00**
				PERCENTAGE LINE ITEMS SUBTOTAL	**$0.00**

PRIMARY CONTRACT :	**$0.00**

II. ARLINGTON COUNTY DES ENGINEERING SPECIAL CONDITIONS

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PROJECT SUMMARY

Project Z261 is a pedestrian safety and street improvement project which includes but is not limited to the installation of curb & gutter, sidewalk along the west side of the street, curb ramps, driveway aprons, full-depth asphalt pavement, tree removals and various other improvements. The project is along N Highland Street from Arlington Boulevard to 1st Road N and includes improvements within the Virginia Department of Transportation (VDOT) Right-of-Way at the intersection of N Highland Street and Arlington Boulevard.

Majority of the project construction work that is to be performed along N Highland Street is located within the Arlington County Right-Of-Way and VDOT Right-of-Way. However, a small portion of the work is located within private property. Therefore, temporary construction easements have been requested for the portion of the work on private property.

The Contractor shall provide all resources to successfully perform the terms of this contract in accordance with project plans, and in compliance with Arlington County and VDOT Standards and Specifications. The Contractor shall perform the work complete, in place, tested, and ready for continuous service.

All work within the VDOT Right-Of-Way shall be performed in accordance with the VDOT Standards and Specifications, unless otherwise noted. All work within the County Right-Of-Way shall be in accordance with the Arlington County Standards and Specifications, unless otherwise noted.

At the time of bid, the utility relocations are under construction. The Contractor shall not start the project until all utility works completed. **The commencement of the construction is scheduled in July 2021.** The start date is subjected to change due to the utility construction progress. The Contractor will be notified if the construction schedule changes.

At the time of bid, new 2-inch gas main is under construction by Washington Gas from south of the intersection of N Highland Street and 1st Street N to north of the intersection of N Highland Street and 1st Road N. Refer to Attachment J for the Washington Gas final design plans indicating the approximate location of the new gas main. The Contractor shall request as-built plan from Washington Gas before the construction. The Contractor is solely responsible for coordinating with Washington Gas to ensure the safe removal of the abandoned gas valves and is also responsible for verifying the location of the active gas valves prior to performing any excavation in that area.

Arlington County will construct new 8-inch water main and abandon existing 6-inch water main before the project from north of the intersection of N Highland Street and Arlington Boulevard to the intersection of N Highland Street and 2nd Street N. Refer to Attachment I for the water main final design plans indicating the approximate location of the new water

main. Arlington County will provide as-built plan per the Contractor request. The water main design shown on Sheets C041.6 and C051.1 will be constructed along with the water main project by others before the project.

At **19 N Highland Street**, the Contractor shall take extra measures to safely preserve the two trees #26 and #27 that flank the proposed driveway apron (See Plan Sheet C031.1), and excavation within that area shall be dug by hand or by light hand equipment. The contractor shall follow the guidance of the Project Officer to perform work on the proposed driveway apron.

At **25 N Highland Street**, the Contractor shall coordinate with the Project Officer regarding existing brick pavers removal and reinstallation. An agreement shall be reached between the Contractor and the property owner on the new brick paver configuration prior to performing any excavation on the property.

At **101 N Highland Street**, the Contractor shall work with the property owner regarding the location of existing lawn sprinkler system. The Contractor shall not disturb the sprinkler system while working around. The Contractor shall restore the sprinkler system to the original condition if any impact on the system during the construction.

At the following addresses **19**, **24, 25, 29, 31, 101, 108, and 109 N Highland Street & 3100 1st Street N**, temporary construction easements have been requested by the County but not yet obtained. If temporary construction easements cannot be obtained, then a slightly modified design along the property frontage will be provided to the Contractor prior to construction. The Contractor shall be required to construct the improvements per the modified design within the County ROW and tie into the existing features without trespassing onto the subject properties.

SUPPLEMENTS TO THE GENERAL CONDITIONS

These Conditions modify the Arlington County Construction General Conditions. All provisions that are not modified or deleted by these Supplemental Conditions shall remain in full force and effect.

The address system used in these Supplemental Conditions is the same as the address system used in the General Conditions, with the prefix "SC" added thereto.

ARTICLE B – DRAWINGS, SPECIFICATIONS AND RELATED DATA

SC-B.10 TESTS

Add the following new language to Paragraph B.10:

All materials testing shall be in compliance with the Arlington County Materials Testing Specification Reference Guide. This document specifies the method and frequency of testing for Arlington County projects. A copy of this document is included in the bid documents. This shall be incidental to the work and no separate payment will be made.

The Contractor shall engage the services of a geotechnical company, acceptable to both the County and VDOT, to conduct all materials testing per the County and VDOT Specifications.

If it is observed that samples for testing are being improperly taken or that samples are being taken from an area that is not fully representative of all project conditions, then Contractor shall take and test additional samples at the County Project Officer's request from areas designated by the County Project Officer and at the Contractor's expense.

In addition, the Contractor shall provide the County with unfettered site access as needed for VDOT/County personnel or VDOT/County consultants to enter the site, inspect, and perform any additional testing for any and all materials (including soil, concrete, asphalt, etc.).

Compaction results must meet VDOT Specifications and be certified by a Geotechnical Engineer licensed in Virginia. This work shall be at no cost to the County.

SC-B.13 SURVEYS AND CONTROLS

Delete Paragraph B.13 in its entirety and insert the following in its place:

Unless otherwise stated, the County will provide horizontal and vertical reference points necessary for the Contractor to proceed with the Work. The Contractor shall carefully preserve all reference points, and in the case of destruction thereof by the Contractor or due to the negligence of the Contractor or of any subcontractor, the Contractor shall be

responsible for expense and damage resulting therefrom and shall be responsible for any mistakes or construction errors that may be caused by the loss or disturbance of such reference points. The Contractor shall be responsible for laying out the Work and shall retain a professional land surveyor licensed in the Commonwealth of Virginia to survey and provide all necessary construction layouts and to establish all control lines, grades, and elevations during construction.

SC-B.14 RECORD DRAWINGS

The Contractor shall maintain a set of red-line drawings. Red-line drawings shall be in accordance with Supplemental Specification 01720, Project Record Documents. A copy of the red line drawings showing work completed shall be submitted monthly to the County prior to the issuance of the monthly progress payment.

For storm, sanitary and water main installations performed with this contract, the contractor shall provide Arlington County with As-Builts that are in accordance with Arlington County DES Construction Standards and Specifications Section 02550, Section 3.3; and Section 02500, Part 3.

ARTICLE C – COUNTY, COUNTY PROJECT OFFICER, AND CONTRACTOR RELATIONS

SC-C.1 STATUS OF COUNTY PROJECT OFFICER OR DESIGNEE

Add the following new language to Paragraph C.1:

The County Project Officer will coordinate and consult with the VDOT Field Inspector as appropriate when working within the VDOT Right-Of-Way.

SC-C.4 INSPECTION OF WORK

Add the following new language to Paragraph C.4:

Contractor shall notify the Project Officer at least 3 working days prior to disturbing any existing, or installing any new, traffic signs, signals, or other traffic control devices. The Contractor shall allow 3 working days for the inspection and approval of the premarkings prior to placing the permanent markings.

SC-C.9 SUPERINTENDENCE BY CONTRACTOR

Add the following new language to Paragraph C.9:

<u>Emergency Contact:</u>

The Contractor shall have a qualified and experienced person who can clearly communicate technical matters regarding the subject project. This person shall be available via phone to respond to emergency situations on the project 24 hours a day.

<u>Site Supervisor:</u>

The Contractor shall have a qualified and experienced site supervisor who can clearly communicate technical matters on-site at all times when construction activity is occurring or when the site is not in a secure state.

<u>Safety Project Officer:</u>

The Contractor shall have at least one (1) employee certified by VDOT in Basic Work Zone Traffic Control on-site at all times that work is occurring and be responsible for the following:

- Placement, maintenance, and removal of work zone traffic control devices,
- Compliance with permit requirements and conditions, approved plans and specifications, the Virginia Work Area Protection Manual, and the Manual of Uniform Traffic Control Devices.

The flagger shall be certified in accordance with the VDOT Flagger Certification Program, the American Traffic Safety Services Association Flagger Certification Program or any other

VDOT approved flagger program. The flagger shall have his/her certification card with them at all times while performing flagging activities.

The Contractor shall have at least one (1) employee certified in OSHA 10 on-site at all times that work is occurring. The employee shall have served as a Project Safety Officer on at least three (3) prior projects. If the contractor has multiple employees with these requirements, the Contractor shall clearly identify which employee shall serve as the Project Safety Officer.

Environmental Project Officer:

The Contractor shall have at least one (1) employee that has successfully completed the VDOT Erosion & Sediment Control Contractor Certification training. The contractor employee shall be on-site during all land disturbance activities. The Contractor shall be responsible for ensuring compliance with all applicable local, State, and Federal erosion and sediment control regulations and permits during land disturbance activities.

If the Contractor proposes to deviate from the approved Erosion and Sediment Control Plan, it shall be the Contractor's responsibility to coordinate and obtain approval from the County Project Officer prior to implementing any changes.

SC-C.11 LANDS BY COUNTY

Add the following new language at the end of C.11:

The Contractor shall confine all activities at the site associated with construction activities, to include storage of equipment and or materials, access to the work, formwork, etc. To within the designated Limits of Disturbance (LOD).

SC-C.13 PROTECTION OF WORK AND PROPERTY

Add the following new language to Subparagraph C.13.c:

The Contractor shall be responsible for all damages caused by their construction activities. The Contractor shall perform or provide repairs, replacements, and restoration to all property that has been damaged resulting from construction operations performed by the Contractor, and shall meet the following requirements:

1. Restore all areas to conditions that existed prior to construction. Remove and Replace damaged items with items equal to or better than the damaged items.

Add the following new language to C.13:

g. The contractor shall contact "Miss Utility" at 811 for marking the locations of existing underground utilities (i.e. Water, sewer, gas, telephone, electric, and cable tv) at least 72 hours prior to any excavation or construction. The contractor is required to identify and protect all other utility lines found in the work site area

belonging to other owners that are not members of "miss utility". Private water and/or sewer laterals will not be marked by “Miss Utility” or the County. The contractor shall locate and protect these services during construction.

ARTICLE E – LEGAL RESPONSIBILITY AND PUBLIC SAFETY

SC-E.1 SITE INVESTIGATION AND CONDITIONS AFFECTING THE WORK

Add the following new language at the end of E.1:

When construction activity reaches in proximity to existing utilities, the trench(es) shall be opened a sufficient distance ahead of the work or test pits shall be made to verify the exact location and inverts of the utility to allow for possible changes in the line or grade as directed by the Project Officer. This shall be incidental to the work and no separate payment shall be made.

SC-E.2 PUBLIC CONVENIENCE

Add the following new language to Paragraph E.2:

The Contractor shall set up controls at the beginning of each work day and take down controls at the end of each work day for the duration of the project. At all times the Contractor shall maintain safe two-way vehicular traffic, and safe accessible pedestrian traffic in conformance with County and VDOT standards. At the end of each work day, the road surface shall be brought flush with the adjacent surface using hot mix asphalt. A minimum of 4" of hot mix asphalt shall be installed. All lanes shall be open for traffic during non-work hours unless otherwise directed in writing by the Project Officer. The Contractor shall maintain all road surfaces within the work area to provide a smooth drivable surface with no significant potholes, dips, or bumps of any kind. Installation and maintenance of temporary repairs shall be considered incidental to the Contract and therefore no additional payment shall be made for this work.

At all times the Contractor shall use the personnel and traffic control signs and devices necessary to comply with the Virginia Work Area Protection Manual and Part VI of the "National Manual on Uniform Traffic Control Devices." The Contractor has sole responsibility for ensuring that its operations are conducted in a safe manner and notwithstanding any other provision to the contrary, shall fully indemnify Arlington County, its officers, agents and employees for any damage or injury related to traffic operations which is caused by negligent or otherwise improper or deficient performance under the Contract or nonperformance of the terms of the Contract. All personnel, signs, barricades and any other items necessary for the maintenance of traffic and safety shall be provided by the Contractor.

When conditions warrant due to traffic volumes, patterns, or special events, the County may suspend or otherwise direct the Contractor's activities to protect the public and or the County's transportation network.

When the project includes a VDOT and/or County approved MOT Plan (or Plans), the Contractor shall strictly abide by this plan. If the Contractor proposes to deviate from the approved MOT Plan for a County road, it shall be the Contractor's responsibility to coordinate and obtain approval from the County Project Officer prior to implementing any changes. If the Contractor proposes to deviate from the approved MOT Plan for a VDOT road, it shall be the Contractor's responsibility to coordinate and obtain approval directly from VDOT prior to implementing any changes.

Prior to any lane closures within the VDOT Right-of-Way, the County Project Officer and VDOT Field Inspector must be notified in advance of such lane closure in accordance with VDOT requirements.

The Contractor shall not be entitled to any additional payment for changes to MOT which are the result of the Contractor's work schedule or resource allocation, weather delays, or other factors not controlled by the County.

Failure of the Contractor to correct any MOT deficiency immediately upon notification may result in the project being shut down until the deficiency is corrected, and a reduction from the amount of payment due in the amount of $1,000.00 per violation. Repeated violations of this provision may result in contract termination.

The Contractor shall install project information signs (size - 24"x36") at least two (2) different locations for each site. Signs will be supplied by the County. Sign posts and incidentals necessary for a complete installation of the signs shall be furnished by the Contractor. Signs shall be installed at least two (2) weeks prior to the start of the construction. The Contractor shall coordinate the location of the signs with the Project Officer. After the project has been completed the Contractor shall remove and return the signs to the County Project Officer. The cost for this work shall be considered incidental to other items within the Contract and no separate payment will be made.

At the close of each work day, the area of work shall be confined to the smallest area possible, but in no event larger than the area designated in the Construction Documents, so that the maximum use of the street and sidewalk shall be restored and the hazard to traffic reduced to the minimum.

The Contractor shall preserve all bus stops, including maintaining adequate accessibility through and adjacent to the construction for buses and their passengers. The Contractor shall not close, relocate, or otherwise modify a bus stop without prior request of the Project Officer. Any relocation or closure of a bus stop will require at least four weeks advance notice for coordination with the county's bus stop coordinator.

SC-E.10 SITE CLEAN-UP AND WASTE DISPOSAL

Add the following new language to Paragraph E.10:

The County's Earth Products Recycling Yard (located at 4300 29th Street South, Arlington, VA) shall **not** be used on an as-needed basis for unspecified quantities of waste (due in part to the limited size of the Yard). Although atypical, the Yard **may** be considered, on a case-by-case basis, for disposal of specific types/quantities of waste from County construction projects. In such cases disposal arrangements must be approved by the County Project Officer, be made in advance, depend on available space and the type/quantity of waste, and comply with certain requirements (for example, concrete shall be broken into pieces no longer than 24" in any dimension, contain less than 20% soil content, and be free of rebar).

SC-E.11 STORMWATER POLLUTION PREVENTION PLAN (SWPPP)

Delete Paragraph 2.

ARTICLE F– PROGRESS AND COMPLETION OF THE WORK

SC-F.2 TIME FOR COMPLETION

Delete Paragraph F.2 and replace with the following language:

It is hereby understood and mutually agreed by and between the Contractor and the County that the Commencement Date, the rate of progress, and the Time for Completion of the Work to be done hereunder are essential conditions of the Contract. The Contractor agrees that the Work shall be started promptly upon receipt of a written Notice to Proceed in accordance with the accepted schedule. Additional time shall not be allowed for holidays or weather delays except as allowed in the contract.

ARTICLE G– MEASUREMENT AND PAYMENT

SC-G.1 PAYMENTS TO CONTRACTOR

Add the following new language to Section G.1:

Payments will be based on actual quantities and site measurements of the approved work taken in the field by the County Project Officer using the Contract Unit Prices. Any Work that is not shown on the approved plans that has not been previously authorized in writing by the Project Officer shall be at the Contractor's expense, and at no cost to the County.

No additional payment for any incidentals will be made unless specifically requested through, and authorized by, the County Project Officer prior to the work. Such determination of additional payment will be at the sole discretion of the County Project Officer, and will be based upon the determination that there exist exceptional conditions which will necessitate significant expenditures of material and/or labor above and beyond the typical installation conditions which could be anticipated in Arlington County.

SPECIAL CONDITIONS

These Special Conditions augment the General Conditions and include any project-specific requirements.

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1. CONSTRUCTION STANDARDS

All work shall conform to project plans and specifications along with the current edition of the following County and VDOT construction standards and specifications:

- **The Arlington County Department of Environmental Services (DES) Bike Parking Standards**, a copy of which may be downloaded at no charge from the internet at: https://info.arlingtontransportationpartners.com/arlington-county-bike-parking-standards
- **The Arlington County Department of Environmental Services (DES) Construction Standards and Specifications**, a copy of Construction Standards Details may be downloaded at no charge from the internet at: http://topics.arlingtonva.us/building/construction-standards-specifications/. The Contractor shall abide the 2019 version of Arlington County Construction Standards and Specifications. See Attachment L for the full document.
- **The Arlington County Department of Environmental Services (DES) Traffic Signal Specifications**, a copy of which may be downloaded at no charge from the internet at: https://transportation.arlingtonva.us/traffic-signal-specification-updates/
- **The Arlington County Department of Environmental Services (DES) Streetlight Specifications**, a copy of which may be downloaded at no charge from the internet at: https://transportation.arlingtonva.us/streets/street-lights/lighting-standards-specifications-updates/
- **The Arlington County Department of Environmental Services (DES) Pavement Marking Specifications**, a copy of which may be downloaded at no charge from the internet at: http://transportation.arlingtonva.us/streets/traffic-signals/
- **The Arlington County Department of Parks and Recreation (DPR) Specifications**, a copy of which may be downloaded at no charge from the internet at: http://parks.arlingtonva.us/design-standards/
- **The Virginia Department of Transportation (VDOT) Road and Bridge Standards and Specifications**, a copy of which may be downloaded at no charge from the internet at: http://www.virginiadot.org/business/locdes/Standards_TOC.asp and http://www.virginiadot.org/business/const/spec-default.asp
- **The Virginia Work Area Protection Manual (WAPM),** a copy of which may be downloaded at no charge from the internet at: http://www.virginiadot.org/business/trafficeng-WZS.asp
- **Manual on Uniform Traffic Control Devices (MUTCD),** a copy of which may be downloaded at no charge from the internet at:

http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/pdf_index.htm

- **The Arlington County Department of Environmental Services (DES) Dechlorination and Disposal Procedures**, a copy of which may be downloaded at no charge from the internet at: http://topics.arlingtonva.us/building/discharging-chlorinated-water/
- **The Supplementary Specifications listed within the Contract**.

In case of a discrepancy, the following order of priority will apply, with the highest governing item appearing first and the least governing item appearing last:

The Contract Bid Items
Special Conditions
Contract Drawings
Supplemental Specifications
Arlington County Construction Standards and Specifications
External Agency Specifications

2. PERMITS

Permits required for the project include, but are not limited to:

- **County Land Disturbing Activities (LDA) permit**
- **County Public Right-Of-Way (PROW) permit**
- **County Transportation Right-Of-Way(TROW) permits**
- **County Water Meter and Fire Hydrant permits**
- **VDOT Land Use permit**

All fees for County permits will be waived by Arlington County, and fees for non-County permits will be paid by Arlington County.

The County will obtain the County LDA permit, the County RPA permit, VDOT Land Use permit, VDOT Open Cut permit, VSMP Permit and then NVRPA permits prior to the start of work. The Contractor shall transfer the County LDA permit, VDOT Land Use Permit, VDOT Open Cut permit and the VSMP Permit in the Contractors name as the permittee and/or responsible party prior to the start of Work. The Contractor shall complete and sign the VDOT forms and submit to the County Project Officer for submission to VDOT two weeks prior to the start of Work within VDOT ROW.

The Contractor shall provide a Responsible Land Disturber (RLD) that meets all the required qualifications of the permits. The Contractor shall complete and sign the RLD certificate and submit to the County Project Officer prior to the start of Work.

The Contractor shall obtain the County PROW permit, the County TROW permits and the County Water Meter and Fire Hydrant permits. The Contractor is responsible for investigating and satisfying all permit requirements for the above-mentioned permits.

3. SPECIAL CONTRACTOR/SUBCONTRACTOR QUALIFICATIONS

The Contractor shall have three (3) continuous years of conducting public works infrastructure and street improvement projects in an urban environment. The experience shall be work of similar size and scope, construction, re-construction, and maintenance.

The Contractor obtained project experience shall consist of the following:

- **State and County streets**
- **Curbs and gutters**
- **Sidewalks and walkways**
- **Driveway aprons**
- **Storm sewer pipes and inlets**
- **Wet Utilities**
- **Pavement markings and signage**
- **Streetscapes and related site work**

The Contractor shall provide a complete list of projects completed within the last five (5) years with reference contact information for each project for Bidder qualification verification. Failure to qualify according to the foregoing requirements will result in bid rejection by the Arlington County Purchasing Office. The County will randomly contact at least five (5) of the references provided.

4. RFIs AND SUPPLEMENTAL INSTRUCTIONS

Request for Information (RFIs) shall be submitted in writing by the Contractor using a County RFI form *(sample attached for information only and which is subject to change at the County's discretion)*, and transmitted via email to the County Project Officer. Only the Contractor, and not Subcontractors, shall submit RFIs.

RFIs shall only be used to request interpretation or clarification of apparent issues or problems found within the contract documents. The Contractor shall clearly identify and detail the issue, and provide its own interpretation within the RFI. Upon receipt of the RFI, the County shall respond to the Contractor via email within five (5) business days.

The following are not considered RFI's and may be rejected by the County if submitted as an RFI by the Contractor:

- **Routine project correspondence**
- **Material or shop drawing submittals**
- **Substitution requests**
- **Change orders**

- **Responses to non-conformance notices**
- **Similar project communications**

Responses to RFIs shall not be construed as authorization for a change order. The County may initiate a change to the contract by noting in the RFI response that a change order will be required. If the Contractor considers an RFI response to be a change to the contract, then the Contractor must notify the County Project Officer in writing immediately.

If changes occur after the individual project assignment is awarded that affect the project plans and specifications, and such change does not affect the contract schedule or cost, then a supplemental instruction may be issued by the County. Supplemental instructions are formal notifications to the Contractor providing additional instructions or to order minor project changes. These adjustments to the project plans and specifications may be the result of RFIs, value engineering, recognition of error/omission, changed conditions, requests for substitutions, etc.

5. WEB-BASED RECORDS DOCUMENTATION

Unless instructed otherwise, the Contractor shall use the web based construction management tool, e-Builder for, but not limited to, submittals, record keeping and document storage of all construction files including, invoices, pay applications, RFIs, approved shop drawings, change orders, construction progress meeting minutes, warranties, equipment specifications and brochures, record drawings, automated alerts and reminders for all functions, and Operation and Maintenance (O&M) Manuals.

6. STAKEOUT AND CUT-SHEETS

The Contractor shall be responsible for laying out the work and shall retain a professional land surveyor licensed in the Commonwealth of Virginia to provide all necessary construction layouts and establish all control lines, grades, and elevation during construction. The Contractor shall submit a copy of all cut-sheets for review, per the Arlington County Specifications. All cut-sheets for layout and construction shall be provided as submittals at least seven (7) calendar days prior to construction of the work included on that cut-sheet. The cost of all necessary surveying services shall be considered incidental to the work and no separate payment shall be made.

7. SCHEDULE, DURATION, AND PHASING REQUIREMENTS

The Contractor shall provide a schedule for all work listed on plans including any additional work not specifically mentioned on plans but was agreed upon with the County prior to work commencing.

Work Duration per task order shall be calculated in accordance with Supplements to the General Condition “SC-F.2 TIME FOR COMPLETION”. The Time for completion shall be used as the basis for the project schedule.

Contractor shall make sure that the submittals/shop drawings are reviewed and accepted and materials ordered and delivered on site as no additional time will be granted for this.

8. WORK HOURS

The Contractor shall comply with **normal daytime working hours** as defined in the County Noise Control Ordinance unless otherwise defined by the project plans and specifications, or approved by the Project Officer.

The Contractor shall comply with **restricted working hours** of 9:00 am to 3:00 pm when working in Arlington County arterial streets unless otherwise indicated on the Maintenance of Traffic Plans for each project.

The Contractor shall comply with **restricted working hours** as defined by VDOT and as noted on the approved VDOT permit when working within the VDOT Right-Of-Way. For restricted work hours in VDOT ROW, see attached "Lane Closure Guidelines in NOVA District". The Contractor is responsible for satisfying all VDOT Permit requirements found at: http://www.virginiadot.org/business/fairfax-permits-main.asp.

In addition, the County reserves the right to restrict working days and hours to accommodate special site conditions as required.

9. GENERAL SITE SECURITY AND CONTROLS

The Contractor is responsible for securing its work area for safety and security. The Contractor shall confine its construction and presence to the Limits of Work, unless otherwise approved by the County Project Officer.

The Contractor shall provide, erect, and maintain barricades, fences, and/or signage as required to protect the general public, workers, and adjoining properties at no additional cost to the County. Before leaving the site at the end of each day, the Contractor shall replace any and all sections of the security fence or barricade moved or removed during work hours.

The Contractor shall maintain clear vehicular access to existing driveways and entrances at all times unless such access is otherwise addressed on County-approved project plans, precluding concrete pouring and curing of such access points, unless otherwise directed by the County Project Officer.

Homeowners shall be notified by the Contractor a minimum of fourteen (14) calendar days in advance of any driveway closure, and driveways can only be closed for a maximum of five (5) calendar days.

The Contractor shall monitor parking of construction personnel's private vehicles and ensure that the public has unobstructed access to and through parking areas.

10. SPECIAL TRAFFIC MAINTENANCE CONSIDERATIONS

None identified at this time.

11. REQUIREMENTS FOR WORK IN EXISTING ROADWAYS

Existing manhole frames, covers, valve boxes and other appurtenances shall be adjusted to the final grade or replaced, as necessary. Unless otherwise specified, the cost for this shall be considered incidental to work, and shall be incorporated into the cost for relevant items. Connections to existing and proposed storm structures are considered incidental and no separate payment will be made.

Removal of concrete pavement, if encountered, will be to the next joint. In some cases, and when approved by the County Project Officer, the Contractor may be allowed to saw cut a neat joint mid-span of the existing concrete pavement. The limits of concrete pavement restoration shall be determined by the County Project Officer.

12. PAVEMENT RESTORATION FOR UTILITY CUTS

Pavement restoration for utility cuts in VDOT Right-Of-Way shall be in accordance with the detail shown in the LUP-OC NOVA Land Use Permit's Special provisions for pavement open cuts.

Pavement restoration for utility cuts in County Right-of-Way shall be in accordance with the Arlington County DES Standard Detail M-6.0 and M-6.1.

Temporary top asphalt installed to provide even grades with the existing roadway before the paving of the entire roadway shall be considered incidental and no payment shall be made by the County for furnishing materials and installation.

13. PAVEMENT MARKING

The Contractor shall have a certified VDOT Pavement Marking Technician present during pavement marking operations. Pavement markings shall be installed prior to opening the roadway to traffic as described in the Supplementary Specifications which includes requirements for temporary pavement markings.

Pavement markings disturbed by construction shall be restored immediately upon restoring pavement and shall be included in the pavement restoration price and shall not be paid as a separate item.

14. TRAFFIC SIGNALS AND STREETLIGHTS

Materials and construction of the communications conduit, streetlights, and traffic signals shall abide by the latest versions of the 'Arlington County Traffic Signal Specifications and Standards' and 'Arlington County Lighting Specifications and Standards. All materials for these areas shall be approved by Arlington County Transportation Engineering and

Operations Bureau. The County Project Officer will facilitate the material specification submissions for review by the Transportation Engineering and Operations Bureau.

The Contractor shall abide by VDOT's requirement to submit signal foundation details for review. These details include, but are not limited to soil tests to verify the detail design, along with any other supporting information required by VDOT in their submission package. Details shall be created for each signal pole foundation and shall be for both three feet and four feet diameter foundations. The County will assist only in the submission of these details to VDOT, if requested. The Contractor is responsible for satisfying all VDOT requirements. The Contractor shall incorporate all costs for this in relevant items and no payment will be made by the County. The submission shall be submitted with enough time for VDOT to adequately review it. The Contractor cannot claim any time delay or any additional compensation due to such delay.

Prior to removal of the existing signal equipment and materials, the Contractor shall meet with the Project Officer to verify which equipment will be returned to the County, when and where the returned equipment will be delivered, and which equipment will be disposed. All costs associated with this shall be incidental to other items in the Contract.

As part of the luminaire installation, Contractor shall install house-side shields in each fixture. These shields will be provided by the County. If requested, the County will demonstrate how to install the shields. The Contractor shall contact the Streetlights Operations Team Manager at (703) 228-6531 to obtain the shields prior to ordering any streetlight materials to ensure they will be available at the time of construction, and to request a demonstration on how to install the shields. Failure to do so will be at the Contractor's expense for time if construction is stopped because the shields are not available. The installation of the shields is considered incidental to the contract and no additional payments shall be made for this work.

15. <u>TEST PITS</u>

The contract unit price for test pits (with restoration included within the unit price) shall apply only in the following cases, upon approval of the County Project Officer:

Utility conflicts shown on the plans provided to the Contractor for construction under this contract, but without test pit information provided by the County.

Utilities, which are not shown on the plans provided to the Contractor for construction under this contract, but are marked by the utility designator prior to construction.

Utilities, where depth verification is required and noted on the plan documents to be performed during construction, or directed by the Project Officer.

Protecting existing utilities is the Contractor's responsibility and any test pits performed to protect the existing utilities shall be incidental to the work and no separate payment shall be made for that purpose.

16. GENERAL EXCAVATION

During construction if the need arises for additional excavation not included in the Contract Documents, the Contractor shall request in writing the need for additional excavation. The Contractor must request approval from the County Project Officer prior to performing the work.

If over-excavation is approved by the County Project Officer, payments will be at the general excavation unit price and will be based on actual site measurements taken by Arlington County personnel using the contract unit prices.

Failure by the Contractor to obtain written approval from the County Project Officer prior to performing any additional excavation will be performed at the Contractor's expense and there will be no cost to the County.

Excavation and shoring of any pits or shafts for trenchless or open trench methods of pipe installation, and any shoring left in place during installation shall be considered incidental to the installation of the pipe and shall be included in the unit price for installation of the pipe.

All sheeting, shoring, and bracing shall be in accordance with the current version of VDOT Specifications. Sheeting and shoring, if utilized may be abandoned in place up to five (5) feet below grade which shall be backfilled, etc. in accordance with the construction documents.

The maximum length of open trench shall be no more than one hundred (100) feet in roadways and three hundred (300) feet elsewhere unless written permission is obtained from the County Project Officer

No excavation shall remain open within the roadway or sidewalk without the approval of the County except when the excavation can be safely bridged with the use of steel plates or other materials acceptable to the County. When areas of excavation do remain open with the use of steel plates, warning signs shall be posted.

Steel plates may not be used within the VDOT Right-Of-Way from November 1st through April 1st. If steel plates are used during the allowable time period of April 2nd through October 31st, then their use shall comply with the most current VDOT Standards and Specifications.

17. BYPASS PUMPING/TEMPORARY FLOW DIVERSION/DEWATERING

The Contractor shall utilize temporary pumps to divert storm, and sanitary sewer flows during construction as required. All equipment used for these purposes shall comply with

the requirements of the Arlington County Noise Ordinance. The Contractor shall be responsible for the installation, operation, and removal of the temporary pumps. The Contractor shall be responsible for utilizing pumps sufficient to bypass the normal flow and dewater the work area.

The Contractor shall furnish, install, operate and maintain all sumps, pumps, casings, wellpoints, dewatering device, portable dams/barriers and other equipment needed to perform the temporary flow diversion and dewatering of the construction site as needed for proper execution of the construction work.

The Contractor shall furnish to the County in writing, a plan for diverting flows and removal of water from the work area before beginning the construction work. Acceptance of this plan will not relieve the Contractor of responsibility for completing the work as specified

The cost for bypass pumping shall be incidental to other items in the Contract; therefore, there will be no separate payment for bypass pumping.

18. TREE PROTECTION AND TRIMMING

Minimizing damage to existing trees is very important. The critical root zone of existing trees is shown on the Construction Plans. Construction within the critical root zone of trees to remain requires root pruning to be performed as shown on the approved Plans in advance of the construction. If roots for trees not marked 'to be removed' on the Construction Plans are found during construction, the Contractor shall notify the Project Officer. The Project Officer shall consult with the Arlington County Urban Forester, then the Project Officer shall determine if additional root pruning is required. The additional root pruning performed by the Contractor shall be paid to the Contractor according to the stipulated price for root pruning.

19. BICYCLE PARKING STANDARDS

The R-8# series details in Bike Parking standards supersede Arlington DES Standard Details R-8.0 and R-8.1.

20. ASPHALT PAVEMENTS

Throughout the contract documents, replace the old Marshall mix asphalt designations with the new Superpave asphalt mix designations as follows:

Old (Marshall) mix designations	**New (Superpave) mix designations**
SM-2A	SM-9.5A
BM-2	BM-25.0A

21. TREE PITS

The contractor shall excavate and prepare tree pits to the length, width and depth specified in the construction plans and corresponding DPR planting detail.

Individual tree pits shall be photo documented using a rigid tape measure. The photograph shall clearly show the depth of each tree pit. Each photograph shall be identified by location using the file name.

The contractor shall email the photographs to the Project Officer, Landscape Architect and Urban Forester.

The contractor must obtain written approval from the Project Officer, with concurrence from the Landscape Architect or Urban Forester before proceeding to fill the tree pits with approved planting soil mix/backfill soil mixture.

The County reserves the right to request the contractor verify the depth of any tree pits at no additional project cost.

22. OTHER SPECIAL PROVISIONS

PVC pipe used for the connection of private gutter drain pipe and/or sump pump pipe shall be considered incidental to the primary work. No separate measurement and payment will be made for that purpose.

ARLINGTON
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ENGINEER
DEPARTMENT OF
ENVIRONMENTAL SERVICES

FACILITIES & ENGINEERING DIVISION
ENGINEERING BUREAU
2100 CLARENDON BOULEVARD, SUITE 813
ARLINGTON, VA 22201
PHONE: 703.228.3629 FAX: 703.228.3606
WWW.ARLINGTONVA.US

OWNER
CPHD / NC

CONTRACTOR
TO BE DETERMINED

Construction Drawing For:

N HIGHLAND STREET
1ST ROAD N TO ARLINGTON BOULEVARD

PROJECT CODE: Z261

LOCATION MAP

GENERAL NOTES:

GENERAL CONSTRUCTION NOTES

1. ALL CONSTRUCTION WORK FOR THIS PROJECT SHALL CONFORM TO THE ARLINGTON COUNTY DEPARTMENT OF ENVIRONMENTAL SERVICES, CONSTRUCTION STANDARDS AND SPECIFICATIONS, AND WHERE APPLICABLE THE VIRGINIA DEPARTMENT OF TRANSPORTATION (VDOT) ROAD AND BRIDGE SPECIFICATIONS, AND ROAD AND BRIDGE STANDARDS. THE LATEST EDITIONS OF EACH RELEVANT MANUAL SHALL BE USED.
2. ALL CONSTRUCTION AND WORK ACTIVITIES SHALL COMPLY WITH THE VIRGINIA WORK AREA PROTECTION MANUAL AND ALL OTHER RELEVANT WORK SAFETY REQUIREMENTS, LATEST EDITIONS.
3. THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE PROJECT OFFICER OF ANY DISCREPANCIES BETWEEN ACTUAL FIELD CONDITIONS AND THE APPROVED PLANS.
4. THE CONTRACTOR SHALL CONTACT "MISS UTILITY" AT 811 FOR MARKING THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES (i.e. WATER, SEWER, GAS, TELEPHONE, ELECTRIC, AND CABLE TV) AT LEAST 72 HOURS PRIOR TO ANY EXCAVATION OR CONSTRUCTION. THE CONTRACTOR IS REQUIRED TO IDENTIFY AND PROTECT ALL OTHER UTILITY LINES FOUND IN THE WORK SITE AREA BELONGING TO OTHER OWNERS THAT ARE NOT MEMBERS OF "MISS UTILITY". PRIVATE WATER, SEWER AND GAS LATERALS WILL NOT BE MARKED BY MISS UTILITY OR THE COUNTY. THE CONTRACTOR SHALL LOCATE AND PROTECT THESE SERVICES DURING CONSTRUCTION.
5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR LAYING OUT THE WORK AND SHALL RETAIN A PROFESSIONAL LAND SURVEYOR LICENSED IN THE COMMONWEALTH OF VIRGINIA TO PROVIDE ALL NECESSARY CONSTRUCTION LAYOUTS AND ESTABLISH ALL CONTROL LINES, GRADES, AND ELEVATION DURING CONSTRUCTION. THE CONTRACTOR SHALL SUBMIT A COPY OF ALL CUT SHEETS FOR REVIEW, PER THE SPECIFICATIONS. THE COST OF ALL NECESSARY SURVEYING SERVICES SHALL BE CONSIDERED INCIDENTAL TO THE WORK AND, UNLESS OTHERWISE SPECIFIED, THE COST SHALL BE INCORPORATED INTO THE COSTS FOR RELEVANT ITEMS.
6. THE LOCATION OF ALL EXISTING UTILITIES SHOWN ON THESE PLANS ARE FROM BEST AVAILABLE RECORDS AND SHALL BE CONSIDERED TO BE APPROXIMATE. WHEN CONSTRUCTION ACTIVITY REACHES IN PROXIMITY TO EXISTING UTILITIES, THE TRENCH(ES) SHALL BE OPENED A SUFFICIENT DISTANCE AHEAD OF THE WORK OR TEST PITS SHALL BE MADE TO VERIFY THE EXACT LOCATION AND INVERTS OF THE UTILITY TO ALLOW FOR POSSIBLE CHANGES IN THE LINE OR GRADE AS DIRECTED BY OFFICER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE TO THE EXISTING UTILITIES AND THE RELATED STRUCTURES. ALL EXISTING UTILITY SYSTEMS SHALL BE PROTECTED TO PREVENT DAMAGE DURING THE CONTRACTOR'S OPERATIONS. ANY SYSTEM DAMAGED SHALL BE PROMPTLY REPAIRED AT NO COST TO THE OWNER.
7. EXISTING MANHOLE FRAMES, COVERS, VALVE BOXES, AND OTHER APPURTENANCES SHALL BE ADJUSTED TO THE FINAL GRADE OR REPLACED, AS NECESSARY. UNLESS OTHERWISE SPECIFIED, THE COST FOR THIS SHALL BE CONSIDERED INCIDENTAL TO THE WORK, AND SHALL BE INCORPORATED INTO THE COSTS FOR RELEVANT ITEMS.
8. THE CONTRACTOR SHALL PROVIDE ADA COMPLIANT ACCESS THROUGH OR AROUND THE SITE AT ALL TIMES AND SHALL ENSURE THE SAFETY OF ALL THOSE PASSING THROUGH OR ADJACENT TO THE SITE.
9. ALL SIDEWALK AND CURB AND GUTTER DEMOLITION SHALL BEGIN AND END AT THE CONSTRUCTION JOINT NEAREST TO THE DEPICTED DEMOLITION EXTENTS WITH A NEAT SAWCUT LINE TO FULL DEPTH OF PAVEMENT SECTION.

STORMWATER AND ENVIRONMENTAL PROTECTION

10. THE CONTRACTOR SHALL CONFINE ALL ACTIVITIES AT THE SITE ASSOCIATED WITH CONSTRUCTION ACTIVITIES, TO INCLUDE STORAGE OF EQUIPMENT AND OR MATERIALS, ACCESS TO THE WORK, FORMWORK, ETC. TO WITHIN THE DESIGNATED LIMITS OF DISTURBANCE (LOD).

TREE PROTECTION

11. TREES SHALL BE PROTECTED PER THE REQUIREMENTS OF ARLINGTON PARKS & RECREATION STANDARD.

TRAFFIC CONTROL

12. CONTRACTOR SHALL NOTIFY THE PROJECT OFFICER AT LEAST 3 WORKING DAYS PRIOR TO DISTURBING ANY EXISTING, OR INSTALLING ANY NEW, TRAFFIC SIGNS, SIGNALS, OR OTHER TRAFFIC CONTROL DEVICES.
13. THE CONTRACTOR SHALL PREMARK THE LAYOUT OF ANY PERMANENT TRAFFIC CONTROL STRIPING, INDICATING THE PROPOSED LOCATION AND TYPE OF MARKING TO BE INSTALLED. THE PREMARKING MAY CONSIST OF TYPE D TAPE, CHALK, OR LUMBER CRAYONS. THE CONTRACTOR SHALL ALLOW 3 WORKING DAYS FOR THE INSPECTION AND APPROVAL OF THE PREMARKINGS PRIOR TO PLACING THE PERMANENT MARKINGS.
14. THE CONTRACTOR SHALL SUBMIT ANY REQUESTS FOR TEMPORARY "NO PARKING" RESTRICTIONS TO THE PROJECT OFFICER AT LEAST 3 WORKING DAYS PRIOR TO THE DESIRED ONSET OF RESTRICTIONS. PRIOR TO A REQUEST FOR THE REMOVAL OF ACCESS TO ANY ADA PARKING SPACE THE CONTRACTOR MUST HAVE MADE PROVISION FOR ALTERNATIVE ADA PARKING AS INDICATED ON THE APPROVED PLAN OR AS DIRECTED BY THE PROJECT OFFICER.
15. WHEN THE APPROVED PLAN CALLS FOR THE REMOVAL OF ANY PARKING METER THE CONTRACTOR MUST MAKE A REQUEST TO THE PROJECT OFFICER AT LEAST ONE WEEK IN ADVANCE OF THE DESIRED REMOVAL. THE PROJECT OFFICER WILL THEN COORDINATE THE PARKING METER REMOVAL WITH TRAFFIC ENGINEERING AND OPERATIONS.
16. THE CONTRACTOR SHALL PRESERVE ALL BUS STOPS, INCLUDING MAINTAINING ADEQUATE ACCESSIBILITY THROUGH AND ADJACENT TO THE CONSTRUCTION FOR BUSES AND THEIR PASSENGERS. THE CONTRACTOR SHALL NOT CLOSE, RELOCATE, OR OTHERWISE MODIFY A BUS STOP WITHOUT PRIOR REQUEST OF THE PROJECT OFFICER. ANY RELOCATION OR CLOSURE OF A BUS STOP SHALL REQUIRE AT LEAST FOUR WEEKS ADVANCE NOTICE FOR COORDINATION WITH THE COUNTY'S BUS STOP COORDINATOR - 703-228-3049.
17. WHEN CONDITIONS WARRANT DUE TO TRAFFIC VOLUMES, PATTERNS, OR SPECIAL EVENTS, THE COUNTY MAY SUSPEND OR OTHERWISE DIRECT THE CONTRACTOR'S ACTIVITIES TO PROTECT THE PUBLIC AND OR THE COUNTY'S TRANSPORTATION NETWORK.

WATER DISTRIBUTION, STORM AND SANITARY SEWER SYSTEMS

18. UNLESS OTHERWISE DIRECTED, CONTRACTORS ARE EXPRESSLY PROHIBITED FROM OPERATING ANY WATER VALVES OR APPURTENANCES. CONTRACTORS SHALL SUBMIT ALL REQUESTS FOR VALVE OPERATIONS TO THE PROJECT OFFICER AT LEAST 1 WEEK IN ADVANCE OF THE REQUIRED OPERATION.
19. IN THE EVENT OF A WATER OR SEWER EMERGENCY, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE COUNTY'S WATER CONTROL CENTER AT 703-228-6555 AND THE PROJECT OFFICER.
20. THE CONTRACTOR SHALL COORDINATE ALL UTILITY SHUTOFFS, DISCONNECTS, AND/OR ABANDONMENT WITH UTILITY OWNER AND PROJECT OFFICER AT LEAST 1 WEEK IN ADVANCE OF THE REQUIRED INTERRUPTION.

FIRE DEPARTMENT NOTES:

21. ALL EXISTING FIRE HYDRANTS AND FIRE DEPARTMENT CONNECTIONS SHALL BE MAINTAINED UNOBSTRUCTED AND ACCESSIBLE AT ALL TIMES IN ACCORDANCE WITH SECTIONS 508.5.4 AND 508.5.5 OF THE ARLINGTON COUNTY FIRE PREVENTION CODE.
22. ACCESS TO BUILDINGS FOR FIREFIGHTING SHALL BE MAINTAINED AT ALL TIMES. EXISTING FIRE APPARATUS ACCESS ROADS (FIRE LANES) SHALL BE KEPT CLEAR OF OBSTRUCTIONS IN ACCORDANCE WITH SECTION 503.4 OF THE ARLINGTON COUNTY FIRE PREVENTION CODE. ACCESS TO CONSTRUCTION SITES SHALL BE PROVIDED AND MAINTAINED IN ACCORDANCE WITH SECTION 1410 OF THE ARLINGTON COUNTY FIRE PREVENTION CODE.
23. IN THE EVENT THAT EXISTING FIRE DEPARTMENT CONNECTIONS OR FIRE APPARATUS ACCESS ROADS (FIRE LANES) MUST BE OBSTRUCTED TO FACILITATE CONSTRUCTION ACTIVITIES, CONTACT THE ARLINGTON COUNTY FIRE DEPARTMENT FIRE PREVENTION OFFICE AT 703-228-4644 TO COORDINATE REVIEW AND APPROVAL OF TEMPORARY FIRE DEPARTMENT CONNECTIONS AND/OR FIRE APPARATUS ACCESS ROADS PRIOR TO CREATING THE OBSTRUCTION.

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LDA19215

SWM19-0202

ADT

N HIGHLAND ST: 1,000 VPD (BASED ON VDOT 2017 JURISDICTION REPORT)
ARLINGTON BLVD: 62,000 VPD (BASED ON VDOT 2017 JURISDICTION REPORT)

STREET CLASSIFICATION

N HIGHLAND ST: NEIGHBORHOOD MINOR
1ST STREET N: NEIGHBORHOOD MINOR
1ST ROAD N: NEIGHBORHOOD MINOR

POSTED SPEED

N HIGHLAND ST: 25 MPH
1ST STREET N: 25 MPH
1ST ROAD N: 25 MPH

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VIRGINIA

DEPARTMENT OF
ENVIRONMENTAL SERVICES
FACILITIES & ENGINEERING DIVISION
ENGINEERING BUREAU
2100 CLARENDON BOULEVARD, SUITE 813
ARLINGTON, VA 22201
PHONE: 703.228.3629
FAX: 703.228.3606

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SEAL
COMMONWEALTH OF VIRGINIA
JIONG LIN
Lic. No. 0402051875
04/07/2020
PROFESSIONAL ENGINEER

APPROVALS	DATE
	4/7/2020
QUALITY CONTROL ENGINEER Kamal N. Taktak	4.7.20
CONSTRUCTION MANAGEMENT SUPERVISOR David W. Hundelt	04.14.2020
WATER, SEWER, STREETS BUREAU CHIEF Dennis M. Leach.	04/13/20
TRANSPORTATION DIRECTOR Tim McIntosh	4/16/20
PROJECT MANAGER	

REVISIONS	DATE

PROJECT NAME AND LOCATION
COVER
N HIGHLAND STREET
1ST ROAD N
TO ARLINGTON BOULEVARD
Z261

DESIGNED: E CACCAVARI
DRAWN: E CACCAVARI
CHECKED: J LIN
MISS UTILITY TRANSMITTAL #5330

FILENAME: Z261-200-COVER.DWG
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PLOTTED BY: ECACCAVARI

SCALE AS NOTED

SHEET C000.1

Revised: 01/21/2016

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D3 DRIVEWAY DETAIL
STANDARD DRIVEWAY 1"=5'

D5 DRIVEWAY DETAIL
STANDARD DRIVEWAY 1"=5'

D7 DRIVEWAY DETAIL
STANDARD DRIVEWAY 1"=5'

D9 DRIVEWAY DETAIL
STANDARD DRIVEWAY 1"=5'

D1 DRIVEWAY DETAIL
STANDARD DRIVEWAY 1"=5'

D2 DRIVEWAY DETAIL
DEPRESSED DRIVEWAY 1"=5'

D4 DRIVEWAY DETAIL
STANDARD DRIVEWAY 1"=5'

D6 DRIVEWAY DETAIL
DEPRESSED DRIVEWAY 1"=5'

Revised: 01/21/2016

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ENGINEERING BUREAU
2100 CLARENDON BOULEVARD, SUITE 813
ARLINGTON, VA 22201
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FAX: 703.228.3606

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TRANSPORTATION DIRECTOR Tim McIntosh	4/16/20
PROJECT MANAGER	

REVISIONS	DATE

PROJECT NAME AND LOCATION
DRIVEWAY DETAILS I
N HIGHLAND STREET
1ST ROAD N
TO ARLINGTON BOULEVARD
Z261

DESIGNED: E CACCAVARI
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SCALE
AS SHOWN

SHEET C002.1

D10 DRIVEWAY DETAIL
STANDARD DRIVEWAY 1"=5'

D12 DRIVEWAY DETAIL
STANDARD DRIVEWAY 1"=5'

D8 DRIVEWAY DETAIL
DEPRESSED DRIVEWAY 1"=5'

D11 DRIVEWAY DETAIL
DEPRESSED DRIVEWAY 1"=5'

D13 DRIVEWAY DETAIL
DEPRESSED DRIVEWAY 1"=5'

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FACILITIES & ENGINEERING DIVISION
ENGINEERING BUREAU
2100 CLARENDON BOULEVARD, SUITE 813
ARLINGTON, VA 22201
PHONE: 703.228.3629
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JIONG LIN
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WATER, SEWER, STREETS BUREAU CHIEF Dennis M. Leach.	04/13/20
TRANSPORTATION DIRECTOR Tim MacIntosh	4/16/20
PROJECT MANAGER	

REVISIONS	DATE

PROJECT NAME AND LOCATION
DRIVEWAY DETAILS II
N HIGHLAND STREET
1ST ROAD N
TO ARLINGTON BOULEVARD
Z261

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Revised: 01/21/2016

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PROP N HIGHLAND STREET

TYPICAL SECTION - 1
STA. 0+50 TO 1+50

∗ NORTH BOUND MILL AND OVERLAY RANGE: STA. 0+50 TO STA. 1+81

PROP N HIGHLAND STREET

TYPICAL SECTION - 2
STA. 1+50 TO 2+58

∗∗ NORTH BOUND FULL DEPTH PAVEMENT RANGE: STA. 1+81 TO STA. 2+50

PROP N HIGHLAND STREET

TYPICAL SECTION - 3
STA. 2+58 TO 7+87.60

∗∗∗ PROPOSED SIDEWALK ENDS AT STA. 7+52.50

NOTE:
PROPOSED N HIGHLAND ST WIDTH VARIES BETWEEN STATIONS 7+27 TO 7+87.60 SEE CROSS SECTIONS SHEETS C044.1 TO C044.4 FOR DETAILS

ARLINGTON VIRGINIA

DEPARTMENT OF ENVIRONMENTAL SERVICES
FACILITIES & ENGINEERING DIVISION
ENGINEERING BUREAU
2100 CLARENDON BOULEVARD, SUITE 813
ARLINGTON, VA 22201
PHONE: 703.228.3629
FAX: 703.228.3606

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JIONG LIN
Lic. No. 0402051875
04/07/2020
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TRANSPORTATION DIRECTOR Tim McIntosh	4/16/20
PROJECT MANAGER	

REVISIONS	DATE

PROJECT NAME AND LOCATION
TYPICAL SECTIONS
N HIGHLAND STREET
1ST ROAD N
TO ARLINGTON BOULEVARD
Z261

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NOT TO SCALE

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LINETYPE LEGEND

FEATURE	EXISTING	PROPOSED
BUILDING		
CENTERLINE / BASELINE		
COMMUNICATIONS CABLE	COM COM	COM COM
CONTOURS - MAJOR, MINOR	250 250	250
CRITICAL ROOT ZONE	CRZ CRZ	CRZ CRZ
EASEMENT		
ELECTRIC (UNDERGROUND)	UGE UGE	UGE UGE
FENCE (MATERIAL NOTED)	X X X X X	X X X X X
FIBER OPTIC	FO FO	FO FO
GAS LINE	GAS GAS	GAS GAS
X" GAS LINE (SIZE INCLUDED IF AVAILABLE)	#" g #" g #" g	X" G X" G
GUARDRAIL		
HARDSCAPE FEATURE (MATERIAL NOTED)		
LIMITS OF DISTURBANCE	LOD LOD	LOD LOD
LIMITS OF WORK	LOW LOW	LOW LOW
OVERHEAD WIRES		
PAVEMENT MINI SKIP LINE		
PAVEMENT SKIP LINE		
PROPERTY LINE		
RIGHT-OF-WAY LINE		
ROOT PRUNING	RP RP	RP RP
SANITARY SEWER	SAN	SAN SAN
SANITARY SEWER UNDER 20" (SIZE INCLUDED IF AVAILABLE)	#" s #" s	X" S X" S
SANITARY SEWER OVER 20"		X" S X" S
SILT FENCE	SF SF	SF SF
STORM (SIZE NOTED)	STM STM	
STREAM		
STREET LIGHT CONDUIT	SL SL	SL SL
TELEPHONE (UNDERGROUND)	UGT UGT	UGT UGT
TREE LINE		
TREE PROTECTION FENCE	TP TP	TP TP
WALL		
WATERLINE UNDER 20" (SIZE INCLUDED IF AVAILABLE)	#" w #" w	
WATERLINE OVER 20"		

SYMBOL LEGEND

EXISTING FEATURE	PROPOSED FEATURE
EX CABLE PEDESTAL	
EX ELECTRIC BOX	
EX FIRE HYDRANT	PROP FIRE HYDRANT
EX GAS VALVE	PROP GAS VALVE
EX GROUND LIGHT	
EX GUY WIRES	
EX IRON PIPE OR PIN	
EX LIGHT POLE	PROP LIGHT POLE
EX MAILBOX	
EX MONUMENT	
EX PARKING METER	
EX PAY STATION	PROP PAY STATION
EX SANITARY MANHOLE	PROP SANITARY MANHOLE
EX STORM BASIN	PROP STORM CATCH BASIN (TO SCALE)
EX STORM MANHOLE	PROP STORM MANHOLE
EX TELEPHONE PEDESTAL	
EX TRAFFIC CONTROL BOX	
EX TRAFFIC SIGN	PROP TRAFFIC SIGN
EX TRASH CAN	PROP TRASH CAN
EX TRAVERSE	
EX TREES, WOODED AREA	PROPOSED TREE REMOVAL
EX UTILITY MANHOLE TYPE INDICATED ELEC, TELE, ETC	
EX UTILITY POLE	PROP UTILITY POLE
EX WATER MANHOLE	PROP WATER MANHOLE
EX WATER METER	PROP WATER METER
EX WATER VALVE	PROP WATER VALVE
EX YARD INLET	PROP YARD INLET (TO SCALE)
EX BENCHMARK	CONSTRUCTION NOTES (LEADER TO AREA AFFECTED)
	DETAIL NUMBER (SEE NOTE)
	CURVE NUMBER (SEE CURVE TABLE)
	LINE NUMBER (SEE LINE TABLE)
	TEST HOLE
	NORTH ARROW

LABEL LEGEND

EXISTING	PROPOSED
EXISTING SANITARY STRUCTURE NUMBER	PROPOSED SANITARY SEWER STRUCTURE NUMBER
EXISTING STORM SEWER STRUCTURE NUMBER	PROPOSED STORM SEWER STRUCTURE NUMBER

HATCH LEGEND

- PROP MILL & OVERLAY SEE TYPICAL SECTION FOR DETAILS
- PROP FULL DEPTH ASPHALT SEE TYPICAL SECTION FOR DETAILS
- PROP CONCRETE
- REPLACE & MATCH EXISTING DRIVEWAY OR LEADWALK. SEE CONSTRUCTION NOTES
- DEMOLITION AREA
- TEMPORARY EASEMENT

ARLINGTON VIRGINIA

DEPARTMENT OF ENVIRONMENTAL SERVICES
FACILITIES & ENGINEERING DIVISION
ENGINEERING BUREAU
2100 CLARENDON BOULEVARD, SUITE 813
ARLINGTON, VA 22201
PHONE: 703.228.3629
FAX: 703.228.3606

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SEAL

COMMONWEALTH OF VIRGINIA
JIONG LIN
Lic. No. 0402051875
04/07/2020
PROFESSIONAL ENGINEER

APPROVALS	DATE
	4/7/2020
QUALITY CONTROL ENGINEER Kamal N. Taktak	4.7.20
CONSTRUCTION MANAGEMENT SUPERVISOR David W. Hundelt	04.14.2020
WATER, SEWER, STREETS BUREAU CHIEF Dennis M. Leach.	04/13/20
TRANSPORTATION DIRECTOR Tim McAntosh	4/16/20
PROJECT MANAGER	

REVISIONS	DATE

PROJECT NAME AND LOCATION

LEGEND

N HIGHLAND STREET
1ST ROAD N
TO ARLINGTON BOULEVARD
Z261

DESIGNED: E CACCAVARI
DRAWN: E CACCAVARI
CHECKED: J LIN
MISS UTILITY TRANSMITTAL #5330

FILENAME: Z261-202-LEGEND.DWG
PATH: Q:\DATA\Z261\DESIGN\CAD\ACTIVE
PLOTTED: JUNE 23 2020
PLOTTED BY: ECACCAVARI

SCALE NOT APPLICABLE

SHEET C006.1

Revised: 01/21/2016

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STORM SEWER

#12494
TOP = 234.16
15" RCP INV. OUT = 230.83

#12490
TOP = 233.93
15" RCP INV. OUT = 231.44

MISC. S.D.M. NO #
TOP = 233.59
15" RCP INV. IN (12490) = 231.17
15" RPC INV. IN = 231.26
15" RCP INV. OUT (12548) = 231.14

#12548
TOP = 230.44
15" RCP INV. IN = 227.19
15" RCP INV. OUT = 223.12

#11799
TOP = 250.01
21" RCP INV. IN (11842) = 243.61

#11842
TOP = 257.36
21" RCP INV. IN (11833) = 247.43
21" RCP INV. OUT (11799) = 247.39

#11833
TOP = 256.57
24" RCP INV. IN (11802) = 249.60
21" RCP INV. OUT (11842) = 247.23

#11802
TOP = 255.15
15" CMP INV. IN = 253.51
15" CMP INV. IN = 253.85
18" RCP INV. IN (11765) = 249.79
15" CMP INV. IN (11796) = 251.64
24" RCP INV. OUT (11833) = 249.55

#11796
TOP = 255.69
15" CMP INV. OUT (11802) = 252.64

#11731
TOP = 259.24
18" RCP INV. OUT (11679) = 253.50

#11679
TOP = 263.42
18" RCP INV. IN (11731) = 252.65
18" RCP INV. OUT (11748) = 252.52

#11748
NOT ABLE TO BE LOCATED, VERIFY ELEVATIONS
TOP (APPROXIMATE) = 256.73
18" RCP INV. (APPROXIMATE) = 250.23

#11765
TOP = 256.02
18" RCP INV. IN (11748) = 250.41
18" RCP INV. OUT (11802) = 250.34

SANITARY SEWER

#500
TOP = 227.42
C/L INV. = 217.93

#501
TOP = 238.60
C/L INV. = 229.06

#502
TOP = 251.60
C/L INV. = 242.15

#2978
TOP = 259.80
C/L INV. = 250.99
C/L INV. (6035) = 240.31

#6035
TOP = 248.42
CL/INV. = 240.95

#41706
TOP = 258.01
CL/INV. = 239.43
INV. IN (41705) = 251.24

#41705
TOP = 259.80
CL/INV. = 253.55

#41704
TOP = 261.11
CL/INV. = 255.16

#41676
TOP = 252.90
CL/INV. = 248.54

#41675
TOP = 259.36
CL/INV. = 254.79

#41674
TOP = 255.57
CL/INV. = 250.34

#3014
TOP = 260.30
CL/INV. = 256.93

#14165
TOP = 257.53
CL/INV. = 250.53

#3060
TOP = 256.25
CL/INV. = 251.88

ADDITIONAL NOTES:

1. SANITARY SEWER LATERALS
LOCATION OF SEWER LATERALS, IF SHOWN ARE APPROXIMATE AND BASED SOLELY ON AVAILABLE RECORDS. SANITARY LATERALS ARE PRIVATELY OWNED AND MAINTAINED. IT'S THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THE LOCATION OF ALL EXISTING LATERALS WITHIN THE LIMITS OF CONSTRUCTION. APPROPRIATE PERMITS AND INSPECTIONS FOR WORK ON ANY LATERALS MUST BE OBTAINED FROM INSPECTION SERVICES. ANY LATERALS ABANDONED WITH THE PROJECT WILL BE CAPPED AT THE SEWER MAIN.

2. OTHER SERVICE LINES
THE FOLLOWING SERVICE LINES WERE ADDED OR ADJUSTED BASED ON AVAILABLE RECORDS AND/OR SITE INSPECTION:
- WATER METERS AND SERVICE LINES ADDED FOR THE HOMES 15, 24, 30, 31, 35, 102,109, 123, 127, 202.

GENERAL SURVEY NOTES:

1.THIS TOPOGRAPHIC SURVEY WAS COMPLETED UNDER THE DIRECT AND RESPONSIBLE CHARGE OF THE COUNTY SURVEY SECTION FROM AN ACTUAL GROUND SURVEY; THE IMAGERY AND/OR ORIGINAL DATA WAS OBTAINED FROM 08/19/2014 TO 10/24/2014; AND THIS PLAT, MAP OR DIGITAL GEOSPATIAL DATA INCLUDING METADATA MEETS MINIMUM ACCURACY STANDARDS UNLESS OTHERWISE NOTED.

2. ORIZONTAL DATUM: VIRGINIA COORDINATE SYSTEM 1983.

3. VERTICAL DATUM: NORTH AMERICAN VERTICAL DATUM 1988.

4. CONTOUR INTERVAL: 1'

5. BOUNDARY INFORMATION SHOWN HEREON WAS COMPILED FROM EXISTING LAND RECORDS AND DOES NOT REPRESENT A FIELD RUN BOUNDARY SURVEY.

ARLINGTON VIRGINIA
DEPARTMENT OF ENVIRONMENTAL SERVICES
FACILITIES & ENGINEERING DIVISION
ENGINEERING BUREAU
2100 CLARENDON BOULEVARD, SUITE 813
ARLINGTON, VA 22201
PHONE: 703.228.3629
FAX: 703.228.3606

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SEAL
COMMONWEALTH OF VIRGINIA
JIONG LIN
Lic. No. 0402051875
04/07/2020
PROFESSIONAL ENGINEER

APPROVALS	DATE
QUALITY CONTROL ENGINEER Kamal N. Taktak	4.7.20
CONSTRUCTION MANAGEMENT SUPERVISOR David W. Hundelt	04.14.2020
WATER, SEWER, STREETS BUREAU CHIEF Dennis M. Leach.	04/13/20
TRANSPORTATION DIRECTOR Tim McIntosh	4/16/20
PROJECT MANAGER	

REVISIONS	DATE

PROJECT NAME AND LOCATION
EXISTING CONDITIONS
N HIGHLAND STREET
1ST ROAD N
TO ARLINGTON BOULEVARD
Z261

DESIGNED: E CACCAVARI
DRAWN: E CACCAVARI
CHECKED: J LIN
MISS UTILITY TRANSMITTAL #5330

FILENAME: Z261-214-EXISTING_CONDITIONS.DWG
PATH: Q:\DATA\Z261\DESIGN\CAD\ACTIVE
PLOTTED: JUNE 23 2020
PLOTTED BY: ECACCAVARI

SCALE
GRAPHIC SCALE
25 0 25
SCALE: 1" = 25'

SHEET C011.1

Revised: 01/21/2016

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GENERAL NOTES

1. INSTALL ALL TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES AND TREE PROTECTION FENCES, AS SHOWN ON THE PLANS, PRIOR TO COMMENCING THE WORK.
2. PROTECT FROM ANY DAMAGE ALL EXISTING UTILITIES, LANDSCAPING, SIGNS, ELECTRICAL TRANSFORMERS, SHELTERS, STRUCTURES, FIRE HYDRANTS, MAIL/MEDIA BOXES, PAVERS, PAVEMENT, AND CURB THAT IS TO REMAIN OR BE RELOCATED. DO NOT DAMAGE SALVAGE ITEMS. CLEAN AND DELIVER SALVAGE ITEMS AS DIRECTED BY THE COUNTY PROJECT OFFICER.
3. COORDINATE UTILITY (PERMANENT AND/OR TEMPORARY) SHUTOFF, DISCONNECT, AND/OR ABANDONMENT WITH UTILITY OWNER AND COUNTY PROJECT OFFICER.
4. SAWCUT EXISTING SIDEWALK, AND CURB & GUTTER AT THE NEAREST JOINT WITH A NEAT SAWCUT LINE TO FULL SECTION DEPTH.
5. SAWCUT EXISTING ASPHALT WITH A NEAT SAWCUT LINE TO FULL SECTION DEPTH.

ARLINGTON
VIRGINIA

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FACILITIES & ENGINEERING DIVISION
ENGINEERING BUREAU
2100 CLARENDON BOULEVARD, SUITE 813
ARLINGTON, VA 22201
PHONE: 703.228.3629
FAX: 703.228.3606

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SEAL
COMMONWEALTH OF VIRGINIA
JIONG LIN
Lic. No. 0402051875
04/07/2020
PROFESSIONAL ENGINEER

APPROVALS	DATE
	4/7/2020
QUALITY CONTROL ENGINEER Kamal N. Taktak	4.7.20
CONSTRUCTION MANAGEMENT SUPERVISOR David W. Hundelt	04.14.2020
WATER, SEWER, STREETS BUREAU CHIEF Dennis M. Leach.	04/13/20
TRANSPORTATION DIRECTOR Tim McIntosh	4/16/20
PROJECT MANAGER	

REVISIONS	DATE

PROJECT NAME AND LOCATION
DEMOLITION PLAN

N HIGHLAND STREET
1ST ROAD N
TO ARLINGTON BOULEVARD
Z261

DESIGNED: E CACCAVARI
DRAWN: E CACCAVARI
CHECKED: J LIN
MISS UTILITY TRANSMITTAL #5330

FILENAME: Z261-228-DEMOLITION_PLAN.DWG
PATH: O:\DATA\Z261\DESIGN\CAD\ACTIVE
PLOTTED: JUNE 23 2020
PLOTTED BY: ECACCAVARI

SCALE
GRAPHIC SCALE
25 0 25
SCALE: 1" = 25'

SHEET C021.1

Revised: 01/21/2016

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Revised: 01/21/2016

EROSION AND SEDIMENT CONTROL LEGEND

3.05 (VESCH)	TEMPORARY SILT FENCE	SF	—X—X—
3.07-2 (VESCH) 3.07-7 (ACG)	STORM DRAIN INLET PROTECTION	IP	
3.08 (VESCH)	CULVERT INLET PROTECTION	CIP	
3.26 (VESCH)	DEWATERING * STRUCTURE	DS	
	LIMITS OF DISTURBANCE		LOD
311300.3	CRITICAL ROOT ZONE		CRZ
311300.5	ROOT PRUNING		
311300.1	TREE PROTECTION		

PROTECT TREE PRIOR TO AND DURING CONSTRUCTION. CONTACT ARLINGTON COUNTY FORESTER PRIOR TO INSTALLATION OF TREE PROTECTION, OR BEGINNING ANY WORK ADJACENT TO TREE. ROOT PRUNING AND HAND DIGGING AS REQUIRED BY COUNTY FORESTER OR AS SHOWN ON PLAN.

EXISTING TREE TO BE REMOVED ✕

* LOCATION OF DEWATERING STRUCTURE(S) NOT SHOWN; TO BE DETERMINED ONSITE AND AT THE APPROVAL OF THE COUNTY PROJECT OFFICER.

NOTES:

1. PLACE INLET PROTECTIONS FOR EXISTING DOWN STREAM CATCH BASINS #11806 ON 1ST RD. N. AND #11907, #11933, #12122, #12143 ON 1ST ST. N.
2. THE CONTRACTOR SHALL BE RESPONSIBLE TO ENSURE ROADWAY, SIDEWALKS, AND TRAILS REMAIN CLEAR OF MUD, GRAVEL, AND DEBRIS AT ALL TIMES.
3. THE EXISTING CURB & GUTTER AND ASPHALT AROUND TREE #37 SHALL BE REMOVED BY HAND OR BY LIGHT HAND EQUIPMENT. TREE PROTECTION FENCING AROUND TREE #37 SHALL BE ON CONCRETE BLOCKS.

THIS SHEET IS FOR EROSION AND SEDIMENT CONTROL USE ONLY

ARLINGTON VIRGINIA

DEPARTMENT OF ENVIRONMENTAL SERVICES
FACILITIES & ENGINEERING DIVISION
ENGINEERING BUREAU
2100 CLARENDON BOULEVARD, SUITE 813
ARLINGTON, VA 22201
PHONE: 703.228.3629
FAX: 703.228.3606

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SEAL
COMMONWEALTH OF VIRGINIA
JIONG LIN
Lic. No. 0402061875
07/27/2020
PROFESSIONAL ENGINEER

APPROVALS	DATE
QUALITY CONTROL ENGINEER	7/28/2020
CONSTRUCTION MANAGEMENT SUPERVISOR	7.27.20
WATER, SEWER, STREETS BUREAU CHIEF	07.27.2020
TRANSPORTATION DIRECTOR	7/27/20
PROJECT MANAGER	

REVISIONS	DATE

PROJECT NAME AND LOCATION
EROSION AND SEDIMENT CONTROL PLAN - (PHASE I & II)
N HIGHLAND STREET
1ST ROAD N
TO ARLINGTON BOULEVARD
Z261

DESIGNED: E CACCAVARI
DRAWN: E CACCAVARI
CHECKED: J LIN
MISS UTILITY TRANSMITTAL #5330

FILENAME: Z261-224-E_AND_S_PLAN.DWG
PATH: Q:\DATA\Z261\DESIGN\CAD\ACTIVE
PLOTTED: JULY 30 2020
PLOTTED BY: ECACCAVARI

SCALE
25 0 25
HORIZ: 1" = 25'

SHEET C031.1

Revised: 01/21/2016

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ARLINGTON
VIRGINIA

DEPARTMENT OF
ENVIRONMENTAL SERVICES

FACILITIES & ENGINEERING DIVISION
ENGINEERING BUREAU
2100 CLARENDON BOULEVARD, SUITE 813
ARLINGTON, VA 22201
PHONE: 703.228.3629
FAX: 703.228.3606

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SEAL

COMMONWEALTH OF VIRGINIA
JIONG LIN
Lic. No. 0402051875
04/07/2020
PROFESSIONAL ENGINEER

APPROVALS	DATE
	4/7/2020
QUALITY CONTROL ENGINEER Kamal N. Taktak	4.7.20
CONSTRUCTION MANAGEMENT SUPERVISOR David W. Hundelt	04.14.2020
WATER, SEWER, STREETS BUREAU CHIEF Dennis M. Leach.	04/13/20
TRANSPORTATION DIRECTOR Tim McAntosh	4/16/20
PROJECT MANAGER	

REVISIONS	DATE

PROJECT NAME AND LOCATION
DOWNSTREAM
STORMWATER ANALYSIS

N HIGHLAND STREET
1ST ROAD N
TO ARLINGTON BOULEVARD

Z261

DESIGNED: E CACCAVARI
DRAWN: E CACCAVARI
CHECKED: J LIN
MISS UTILITY TRANSMITTAL #5330

FILENAME: Z261-DOWNSTREAM ANALYSIS.DWG
PATH: G:\DATA\Z261\DESIGN\CAD\ACTIVE
PLOTTED: JUNE 23 2020
PLOTTED BY: ECACCAVARI

SCALE
GRAPHIC SCALE
150 0 150
SCALE: 1" = 150'

SHEET C031.2

EROSION AND SEDIMENT CONTROL NARRATIVE

PROJECT DESCRIPTION:

THE N HIGHLAND STREET IMPROVEMENT PROJECT IS LOCATED BETWEEN ARLINGTON BLVD AND 1ST RD N WHICH IS LOCATED WITHIN THE LOWER LONG BRANCH WATERSHED AND INCLUDES NEW CURB & GUTTER ON BOTH SIDES OF THE STREET, NEW CONCRETE SIDEWALK ON THE WEST SIDE OF THE STREET, ADA COMPLIANT PEDESTRIAN RAMPS, NEW CONCRETE DRIVEWAY APRONS, AND NEW FULL DEPTH PAVEMENT.

EXISTING SITE CONDITIONS:

N HIGHLAND ST A TWO LANE ROAD, AVERAGE SLOPES IS 3% TO 4% AND THERE ARE FEW FLAT AREAS, LOW POINT IS LOCATED BETWEEN 1ST RD N AND 2ND ST N WHICH IS OUT OF THE CONSTRUCTION LIMITS OF THIS PROJECT. THERE ARE NO SIDEWALKS EXCEPT AT WEST CORNER OF ARLINGTON BLVD AND AT 1ST ST N EAST CORNER.

ADJACENT PROPERTIES:

ADJACENT PROPERTIES AROUND THE PROJECT AREA ARE SINGLE FAMILY DETACHED HOUSES. THERE IS A CHURCH AT THE NORTH WEST CORNER OF THE ARLINGTON BLVD AND N HIGHLAND ST INTERSECTION.

OFF-SITE AREAS:

THE EXTENT OF OFFSITE CONSTRUCTION IS LIMITED TO CONNECTING TO THE EXISTING PUBLIC AND PRIVATE STREETS, DRIVEWAYS, AND SIDEWALKS ADJACENT TO AFFECTED PARCELS, AND CONNECTING TO EXISTING UTILITIES.

CRITICAL AREAS:

THERE ARE NO STEEP SLOPES OR CRITICAL AREAS LOCATED WITHIN THE LIMITS OF CONSTRUCTION.

EROSION AND SEDIMENT CONTROL MEASURES:

THE EROSION AND SEDIMENT CONTROL MEASURES FOR THIS PROJECT AREA INCLUDE SILT FENCE CULVERT INLET PROTECTION, AND INLET PROTECTION. INLET PROTECTION IS REQUIRED OUTSIDE THE PROJECT LIMITS WHEN/WHERE WATER FROM DISTURBED AREA FLOWS.

PERMANENT STABILIZATION:

ALL AREAS DISTURBED BY CONSTRUCTION SHALL BE STABILIZED WITH GRASS, MULCH OR SOD. SEE THE PROPOSED PLANS FOR ADDITIONAL INFORMATION.

STORMWATER RUNOFF CONSIDERATIONS:

ADDITIONAL 1,020 SF IMPERVIOUS AREA WILL BE ADDED TO THIS PROJECT.

TOTAL LAND DISTURBANCE.....= 35,064 SF (0.81 ACRES)
PRE-IMPROVEMENT IMPERVIOUS AREA.....= 25,290 SF (0.58 ACRES)
POST-IMPROVEMENT IMPERVIOUS AREA...= 26,310 SF (0.61 ACRES)
INCREASED IMPERVIOUS AREA.....= 1,020 SF (0.02 ACRES)

	ARLINGTON ROW		VDOT ROW	
TOTAL LD	34,946 SF	0.8022 AC	118.00 SF	0.0027 AC
PRE-IMP.	25,278 SF	0.5803 AC	0.00 SF	0.0000 AC
POST-IMP.	26,310 SF	0.6040 AC	39.00 SF	0.0009 AC
INCREASED IMP.	1,032 SF	0.0237 AC	39.00 SF	0.0009 AC

SOILS INFORMATION:

THE FOLLOWING SOILS ARE FOUND ON SITE.

SOIL#:	SOIL NAME:	HYDROLOGIC GROUP:	ERODABILITY:
4B	URBAN LAND-SASSAFRAS-NEABSCO COMPLEX	VARIES	N/A

FLOODPLAIN AND RESOURCE PROTECTION AREA (RPA):

THERE ARE NO FLOODPLAIN OR RESOURCE PROTECTION AREAS LOCATED WITHIN THIS PROJECT SITE

EROSION & SEDIMENT CONTROL PROJECT PHASING

1. **PHASE I:**
   - a. PRE-CONSTRUCTION MEETING WITH THE PROJECT OFFICER, CONTRACTOR, AND COUNTY INSPECTOR.
   - b. INSTALL THE TEMPORARY CONSTRUCTION ENTRANCE (IF NEEDED) IN THE LOCATION SHOWN ON THE E&S PHASE I PLAN. MUD AND DEBRIS SHALL BE WASHED FROM ALL TRUCKS EXISTING THE SITE.
   - c. INSTALL PERIMETER TREE DEMARCATION FENCING IN THE FORM OF TREE PROTECTION FENCE (TP) AS SHOWN ON E&S PHASE I PLAN.
   - d. PERFORM INITIAL PERIMETER CLEARING TO INSTALL REMAINDER OF PERIMETER CONTROLS SUCH AS DIVERSION DIKE (DD), SILT FENCE (SF), AND SUPER SILT FENCE (SSF) AS PER THE PHASE I PLAN.
   - e. SEED AND MULCH ALL EARTHEN CONTROLS.
   - f. CONTACT ARLINGTON COUNTY PROJECT OFFICER FOR A PERIMETER INSPECTION PRIOR TO CLEARING THE REMAINDER OF THE SITE IN ORDER TO OBTAIN PHASE II GRADING PERMIT.
   - g. CLEAR THE SITE TO THE LIMITS AS SHOWN ON THE CONSTRUCTION PLANS.
2. **PHASE II:**
   - a. BEGIN UTILITY CONSTRUCTION, INSTALL ALL UTILITIES UNDERGROUND UTILITIES AND BEGIN SITE GRADING.
   - b. INLET PROTECTION (IP) SHALL BE PROVIDED AT STORM DRAIN INLETS AS THEY ARE CONSTRUCTED.
   - c. ONCE THE SITE IS BOUGHT TO NEAR FINAL GRADE, AND THE UTILITY CONSTRUCTION IS COMPLETE, COMMENCE CONSTRUCTION OF CURB & GUTTER, STREET, SIDEWALKS, AND OTHER IMPROVEMENTS
   - d. THE CONTROL MEASURES MAY NOT BE REMOVED UNTIL ALL OF THE DISTURBED AREAS HAVE BEEN STABILIZED AND ONLY AS APPROVED AND DIRECTED BY THE INSPECTOR.

RUNOFF SHALL BE TREATED WITH SILT FENCE AND INLET PROTECTION PRIOR TO ENTERING MAJOR STORM SEWER SYSTEMS.

EROSION AND SEDIMENT CONTROL MEASURES

UNLESS OTHERWISE INDICATED, ALL VEGETATIVE AND STRUCTURAL EROSION AND SEDIMENT CONTROL PRACTICES SHALL BE CONSTRUCTED AND MAINTAINED ACCORDING TO MINIMUM STANDARDS AND SPECIFICATIONS OF THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK AND THE ARLINGTON COUNTY EROSION AND SEDIMENT CONTROL ORDINANCE. THE MINIMUM STANDARDS OF THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK SHALL BE ADHERED TO UNLESS OTHERWISE WAIVED OR APPROVED BY A VARIANCE.

1. STRUCTURAL PRACTICES

a. TEMPORARY CONSTRUCTION ENTRANCE - VESCH 3.02

- a.a. A TEMPORARY CONSTRUCTION ENTRANCE WITH A WASH RACK SHALL BE INSTALLED AT THE EXISTING ACCESS POINT TO THE SITE. DURING MUDDY CONDITIONS, DRIVERS OF CONSTRUCTION VEHICLES WILL BE REQUIRED TO WASH THEIR WHEELS BEFORE RE-ENTERING THE LOCAL ROADWAYS.
- a.b. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOW OF MUD ONTO PUBLIC RIGHTS-OF-WAY. THIS MAY REQUIRE PERIODIC WASHING OF THE MATS AND/OR REPLACEMENT OF WOOD CHIPS AS NECESSARY.
- a.c. ALL MATERIALS SPILLED, DROPPED, WASHED, OR TRACKED FROM VEHICLES ONTO ROADWAYS OR INTO STORM DRAINS MUST BE REMOVED IMMEDIATELY.
- a.d. THE USE OF WATER TRUCKS TO REMOVE MATERIALS DROPPED, WASHED, OR TRACKED INTO ROADWAYS WILL NOT BE PERMITTED UNDER ANY CIRCUMSTANCES.

b. SILT FENCE - VESCH 3.05

- b.a. SILT FENCE WILL BE INSTALLED WITH THE E&S PLAN TO FILTER RUNOFF FROM DISTURBED AREAS. RUNOFF SHALL NOT BE DIRECTED PARALLEL TO THE INSTALLATION OF SILT FENCE.
- b.b. SILT FENCES SHALL BE INSPECTED IMMEDIATELY AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALL. ANY REQUIRED REPAIRS SHALL BE MADE IMMEDIATELY.
- b.c. CLOSE ATTENTION SHALL BE PAID TO THE REPAIR OF DAMAGED SILT FENCE RESULTING FROM UNDERCUTTING.
- b.d. SHOULD THE FABRIC ON A SILT FENCE DECOMPOSE OR BECOME INEFFECTIVE PRIOR TO THE END OF THE EXPECTED USABLE LIFE, THE FABRIC SHALL BE REPLACED IMMEDIATELY.
- b.e. SEDIMENT DEPOSITS SHALL BE REMOVED AFTER EACH STORM EVENT. THEY MUST BE REMOVED WHEN DEPOSITS REACH APPROXIMATELY ONE-HALF THE HEIGHT OF THE BARRIER.
- b.f. ANY SEDIMENT DEPOSITS REMAINING IN PLACE AFTER THE SILT FENCE IS NO LONGER REQUIRED SHALL BE DRESSED TO CONFORM WITH THE EXISTING GRADE, THEN PREPARED AND SEEDED.

c. TEMPORARY DIVERSION DIKE - VESCH 3.09

- c.a. A SYSTEM OF TEMPORARY DIKES, TO DIRECT FLOW INTO PROPOSED & EXISTING STORM SEWER STRUCTURES WILL BE INSTALLED AS INDICATED IN EROSION & SEDIMENT CONTROL PLAN.
- c.b. THE STRUCTURES SHALL BE INSPECTED AFTER EACH RAIN EVENT AND REPAIRS SHALL BE MADE AS NECESSARY.

d. STORM DRAIN INLET PROTECTION - VESCH 3.07

- d.a. ALL EXISTING & PROPOSED STORM SEWER INLETS IN AND AROUND THE PROJECT LIMITS SHALL BE PROTECTED DURING CONSTRUCTION. SEDIMENT-LADEN WATER SHALL BE FILTERED BEFORE ENTERING THE STORM SEWER INLETS.
- d.b. THE STRUCTURE SHALL BE INSPECTED AFTER EACH RAIN EVENT AND REPAIRS SHALL BE MADE AS NECESSARY.
- d.c. STRUCTURES SHALL BE REMOVED AND THE AREA STABILIZED WHEN THE REMAINING DRAINAGE AREA HAS BEEN PROPERLY STABILIZED.

e. DEWATERING STRUCTURE - VESCH 3.26

- e.a. SEDIMENT LADEN OR TURBID WATER SHALL BE FILTERED, SETTLED OR SIMILARLY TREATED PRIOR TO DISCHARGE.
- e.b. THE FILTERING DEVICES MUST BE INSPECTED FREQUENTLY AND REPAIRED OR REPLACED ONCE THE SEDIMENT BUILD-UP PREVENTS THE STRUCTURE FROM FUNCTIONING AS DESIGNED.
- e.c. THE ACCUMULATED SEDIMENT WHICH IS REMOVED FROM A DEWATERING DEVICE MUST BE SPREAD ON-SITE AND STABILIZED OR DISPOSED OF AT AN APPROVED DISPOSAL SITE AS PER THE APPROVED PLAN.

f. TREE PROTECTION - VESCH 3.38

- f.a. ALL TREES ARE TO BE PROTECTED UNLESS OTHERWISE DIRECTED BY THE COUNTY INSPECTOR AND URBAN FORESTER. THE COUNTY'S URBAN FORESTER (703-228-1863) SHALL INSPECT ALL TREE PROTECTION 72 HOURS PRIOR TO THE START OF CONSTRUCTION. IN SPITE OF PRECAUTIONS, SOME DAMAGE TO PROTECTED TREES MAY OCCUR. IN SUCH CASES, THE FOLLOWING MAINTENANCE GUIDELINES SHALL BE FOLLOWED:
  - f.a.a. SOIL AERATION: IF THE SOIL HAS BECOME COMPACTED OVER THE ROOT ZONE OF ANY TREE, THE GROUND SHALL BE AERATED BY PUNCHING HOLES WITH AN IRON BAR. THE BAR SHALL BE DRIVEN 1-FOOT DEEP AND THEN MOVED BACK AND FORTH UNTIL THE SOIL IS LOOSENED. THIS PROCEDURE SHALL BE REPEATED EVERY 18 INCHES UNTIL ALL OF THE COMPACTED SOIL BENEATH THE CROWN OF THE TREE HAS BEEN LOOSENED.
  - f.a.b. REPAIR OF DAMAGE:
    - f.a.A.a. ANY DAMAGE TO THE CROWN, TRUNK, OR ROOT SYSTEM OF ANY TREE RETAINED ON THE SITE SHALL BE REPAIRED IMMEDIATELY.
    - f.a.A.b. WHENEVER MAJOR ROOT OR BARK DAMAGE OCCURS, REMOVE SOME FOLIAGE TO REDUCE THE DEMAND FOR WATER AND NUTRIENTS.
    - f.a.A.c. DAMAGED ROOTS SHALL IMMEDIATELY BE CUT OFF CLEANLY INSIDE THE EXPOSED OR DAMAGED AREA. CUT SURFACES SHALL BE PAINTED WITH APPROVED TREE PAINT, AND MOIST PEAT MOSS, BURLAP, OR TOPSOIL SHALL BE SPREAD OVER THE EXPOSED AREA.
    - f.a.A.d. TO TREAT BARK DAMAGE, CAREFULLY CUT AWAY ALL LOOSENED BARK BACK INTO THE UNDAMAGED AREA, TAPER THE CUT AT THE TOP AND BOTTOM, AND PROVIDE DRAINAGE AT THE BASE OF THE WOUND.
    - f.a.A.e. ALL TREE LIMBS DAMAGED DURING CONSTRUCTION OR REMOVED FOR ANY OTHER REASON SHALL BE CUT OFF ABOVE THE COLLAR AT THE PRECEDING BRANCH JUNCTION.
    - f.a.A.f. CARE FOR SERIOUS INJURIES SHALL BE PRESCRIBED BY A FORESTER OR A TREE SPECIALIST.
- f.b. FERTILIZATION: BROADLEAF TREES THAT HAVE BEEN STRESSED OR DAMAGED SHALL RECEIVE A HEAVY APPLICATION OF FERTILIZER TO AID THEIR RECOVERY.
  - f.b.a. TREES SHALL BE FERTILIZED IN THE LATE FALL (AFTER OCTOBER 1) OR THE EARLY SPRING (FROM THE TIME FROST IS OUT OF THE GROUND UNTIL MAY 1). FALL APPLICATIONS ARE PREFERRED, AS THE NUTRIENTS WILL BE MADE AVAILABLE OVER A LONGER PERIOD OF TIME.
  - f.b.b. FERTILIZER SHALL BE APPLIED TO THE SOIL OVER THE FEEDER ROOTS. IN NO CASE SHALL IT BE APPLIED CLOSER THAN 3 FEET TO THE TRUNK. THE ROOT SYSTEM OF CONIFERS EXTENDS SOME DISTANCE BEYOND THE DRIP LINE. INCREASE THE AREA TO BE FERTILIZED BY ONE FOURTH THE AREA OF THE CROWN.
  - f.b.c. FERTILIZER SHALL BE APPLIED USING APPROVED FERTILIZATION METHODS AND EQUIPMENT.
  - f.b.d. FORMULATIONS AND APPLICATION RATES SHALL CONFORM TO THE GUIDELINES GIVEN IN TABLE 3.38-A OF VESCH.

2. VEGETATIVE PRACTICES

a. TOPSOILING (STOCKPILE) - VESCH 3.30

- a.a. TOPSOIL WILL BE STRIPPED FROM AREAS TO BE GRADED AND STOCKPILED FOR LATER USE. STOCKPILE LOCATIONS MAY HAVE TO BE LOCATED OFF-SITE AND ARE TO BE STABILIZED WITH TEMPORARY VEGETATION. PRIOR TO LAND-DISTURBING ACTIVITIES, THE CONTRACTOR SHALL SUBMIT A SUPPLEMENTARY E&S PLAN (IF THE STOCKPILE IS LOCATED OFF-SITE). THIS SUPPLEMENTAL PLAN WOULD HAVE TO BE APPROVED BY THE PLAN APPROVING AUTHORITY BEFORE ANY OFF-SITE ACTIVITY COMMENCES.

b. TEMPORARY SEEDING - VESCH 3.31

- b.a. ALL DENUDED AREAS, WHICH WILL BE LEFT DORMANT FOR EXTENDED PERIODS OF TIME SHALL BE SEEDED WITH FAST GERMINATING TEMPORARY VEGETATION IMMEDIATELY FOLLOWING GRADING. SELECTION OF THE SEED MIXTURE WILL DEPEND ON THE TIME OF YEAR IT IS APPLIED.
- b.b. SEE SHEET III-288 OF THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK (VESCH) FOR ALLOWABLE PLANTING MATERIAL, SEEDING RATES, AND DATES. THE PLANTING REQUIREMENTS OF THE "SOUTH" SHALL BE FOLLOWED. LIMING SHALL BE BASED ON TABLE 3.31-A OF VESCH. FERTILIZERS SHALL BE APPLIED AS 600 LB/ACRE. THE FERTILIZER SHALL BE INCORPORATED INTO THE TOP 2-4" OF SOIL. SEED SHALL BE EVENLY APPLIED AND SMALL GRAINS SHALL BE PLANTED NO MORE THAN 1.5" DEEP. SEEDING MADE IN FALL FOR WINTER COVER AND DURING HOT SUMMER MONTHS SHALL BE MULCHED.

c. EROSION CONTROL BLANKET AND MULCHING - VESCH 3.36 AND 3.35

- c.a. EROSION CONTROL BLANKETS WILL BE INSTALLED OVER FILL SLOPES WHICH HAVE BEEN BROUGHT TO FINAL GRADE AND HAVE BEEN SEEDED TO PROTECT THE SLOPES FROM RILL AND GULLY EROSION AND TO ALLOW SEED TO GERMINATE PROPERLY. MULCH (STRAW OR FIBER) WILL BE USED ON RELATIVELY FLAT AREAS AND WILL BE APPLIED AS A SECOND STEP IN SEEDING OPERATION.

d. DUST CONTROL - VESCH 3.39

- d.a. DUST SHALL BE CONTROLLED USING A VARIETY OF METHODS SUCH AS VEGETATIVE COVER, MULCH, TILLAGE, IRRIGATION, SPRAY-ON ADHESIVES, STONE BARRIERS, AND CALCIUM CHLORIDE. THE IMPLEMENTATION OF THE DUST CONTROL METHODS SHALL BE INSTALLED PER SECTION 3.39 OF VESCH

e. PERMANENT SEEDING - VESCH 3.32

- e.a. SINCE THE SUBJECT SITE IS LOCATED WITHIN THE COASTAL PLAIN AREA OF VIRGINIA, SHEET III-304 OF THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK SHALL BE FOLLOWED FOR FINAL SEEDING MATERIAL, SEEDING RATES, AND DATES OF APPLICATION.

f. SODDING - VESCH 3.33

- f.a. SODDED AREAS SHALL BE BROUGHT TO FINAL GRADE IN ACCORDANCE WITH THE APPROVED PLANS. SOIL TESTS SHALL BE MADE TO DETERMINE THE EXACT REQUIREMENTS FOR LIME AND FERTILIZER. PRIOR TO LAYING SOD, SOIL SURFACE SHALL BE CLEAR OF TRASH, DEBRIS AND LARGE OBJECTS. QUALITY OF SOD SHALL BE STATE CERTIFIED TO ENSURE GENETIC PURITY AND HIGH QUALITY. SOD SHALL NOT BE LAID ON FROZEN SOIL SURFACE, OR IN EXCESSIVELY WET OR DRY WEATHER. SOD SHALL BE DELIVERED AND INSTALLED WITHIN 36 HOURS, AND SHALL BE INSTALLED PER PAGE III-339 OF VESCH.

THE EROSION AND SEDIMENT CONTROL INSPECTOR SHALL HAVE THE AUTHORITY TO ADD OR DELETE EROSION AND SEDIMENT CONTROLS AS NEEDED IN THE FIELD. IN ADDITION, NO SEDIMENT TRAPS OR BASINS MAY BE REMOVED WITHOUT PRIOR APPROVAL OF THE INSPECTOR.

EROSION AND SEDIMENT CONTROL MANAGEMENT MEASURES

LANDSCAPE / TREE PRESERVATION NOTES

PRIOR TO ANY LAND DISTURBING ACTIVITY, THE CONTRACTOR SHALL CONTACT THE ARLINGTON COUNTY ARBORIST TO SCHEDULE AN INSPECTION.

LAND CONSERVATION NOTES:

1. NO DISTURBED AREA WILL REMAIN DENUDED FOR MORE THAN 7 CALENDAR DAYS UNLESS OTHERWISE AUTHORIZED BY THE DIRECTOR OR HIS AGENT.
2. ALL EROSION AND SEDIMENT CONTROL MEASURES ARE TO BE PLACED PRIOR TO OR AS THE FIRST STEP IN GRADING. FIRST AREAS TO BE CLEARED ARE TO BE THOSE REQUIRED FOR THE PERIMETER CONTROLS.
3. ALL STORM AND SANITARY SEWER LINES NOT IN STREETS ARE TO BE MULCHED AND SEEDED WITHIN 5 DAYS AFTER BACKFILL. NO MORE THAN 100 FEET ARE TO BE OPEN AT ANY ONE TIME.
4. ELECTRIC POWER, TELEPHONE AND GAS SUPPLY TRENCHES ARE TO BE COMPACTED, SEEDED AND MULCHED WITHIN 5 DAYS AFTER BACKFILLING.
5. ALL TEMPORARY EARTH BERMS, DIVERSIONS AND SEDIMENT CONTROL DAMS ARE TO BE MULCHED AND SEEDED FOR TEMPORARY VEGETATIVE COVER IMMEDIATELY AFTER GRADING. STRAW OR HAY MULCH IS REQUIRED. THE SAME APPLIES TO ALL SOIL STOCKPILES.
6. DURING CONSTRUCTION, ALL STORM SEWER INLETS WILL BE PROTECTED BY INLET PROTECTION.
7. ANY DISTURBED AREA NOT COVERED BY NOTE 1 ABOVE AND NOT PAVED, SODDED OR BUILT UPON BY NOV. 1, OR DISTURBED AFTER THAT DATE, SHALL BE MULCHED IMMEDIATELY WITH HAY OR STRAW MULCH AT THE RATE OF 2 TONS/ACRE AND OVER-SEEDED BY APRIL 15.
8. AT THE COMPLETION OF ANY PROJECT CONSTRUCTION AND PRIOR TO BOND RELEASE, ALL TEMPORARY SEDIMENT CONTROLS SHALL BE REMOVED AND ALL DENUDED AREAS SHALL BE STABILIZED.

EROSION & SEDIMENT CONTROL PROGRAM:

1. THE EROSION CONTROL PLAN IS INTENDED TO ESTABLISH ENTRANCES AND PERIMETER CONTROL MEASURES WHICH INCLUDES SILT FENCE (SF), INLET PROTECTION (IP), AND OTHER CONTROLS SPECIFIED ON THE PLANS.
2. WHERE CONSISTENT WITH JOB SAFETY REQUIREMENTS, ALL EXCAVATED MATERIAL SHALL BE PLACED ON THE UPHILL SIDE OF TRENCHES. NO MATERIAL SHALL BE PLACED IN STREAMBEDS. ANY STOCKPILED MATERIAL WHICH WILL REMAIN IN PLACE LONGER THAN 7 DAYS SHALL BE SEEDED AND MULCHED. WHEN SPOIL IS PLACED ON THE DOWNHILL SIDE OF TRENCH, IT SHALL BE BACKSLOPED TO DRAIN TOWARD THE TRENCH. WHEN NECESSARY TO DEWATER THE TRENCH, THE PUMP DISCHARGE HOSE SHALL OUTLET IN A STABILIZED AREA OR A SEDIMENT TRAPPING DEVICE.
3. ALL PRACTICES AND CONTROL DEVICES DESCRIBED HEREIN SHALL CONFORM TO THE CURRENT VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK (VESCH). IN ADDITION, THE CONTRACTOR SHALL TAKE THE FOLLOWING STEPS TO MINIMIZE THE VOLUME OF SILT:
   - a. CONTRACTOR SHALL EVALUATE THE SITE TO DETERMINE EXTENSIVE CUT AND FILL AREAS, AND SHALL WORK THOSE AREAS TO MINIMIZE THE USE OF HEAVY EQUIPMENT. CONTRACTOR SHALL BRING DISTURBED AREAS TO GRADE (ROUGH OR FINISHED) AND STABILIZE THOSE AREAS WITH TEMPORARY OR PERMANENT VEGETATION. THESE DISTURBED AREAS SHALL BE STABILIZED PRIOR TO BEGINNING WORK IN ANOTHER AREA.
   - b. FILL AREAS SHALL BE COMPACTED COMPLETELY PRIOR TO THE END OF EACH WORK DAY. FILL SLOPE SURFACES SHALL BE KEPT ROUGH TO REDUCE SHEET EROSION OF THE SLOPES. CONTRACTOR SHALL RE-DIRECT CONCENTRATED RUNOFF, BY EARTH BERMS OR OTHER DEVICES, AROUND ACTIVELY DISTURBED AREAS TO STABILIZED OUTLETS.
   - c. CUT SLOPES SHALL BE PROTECTED FROM CONCENTRATED FLOW BY BERMS (ABOVE THE SLOPE) AND DIRECTED AROUND THE DISTURBED AREA TO STABILIZED OUTLETS.
4. MEASURES TO CONTROL EROSION AND SILTATION SHALL BE PROVIDED PURSUANT TO AND IN COMPLIANCE WITH CURRENT STATE AND LOCAL REGULATIONS. THE INFORMATION CONTAINED IN THE CONSTRUCTION PLANS AND/OR THE APPROVAL OF THE PLANS SHALL IN NO WAY RELIEVE THE CONTRACTOR OR HIS AGENT OF ANY LEGAL RESPONSIBILITY WHICH MAY BE REQUIRED BY THE CODE OF VIRGINIA AND CHAPTER 57 OF THE ARLINGTON COUNTY CODE.
5. ALL AREAS, ON OR OFF-SITE, THAT ARE DISTURBED BY THIS CONSTRUCTION AND WHICH ARE NOT PAVED OR BUILT UPON SHALL BE ADEQUATELY STABILIZED TO CONTROL EROSION AND SEDIMENTATION. ACCEPTABLE STABILIZATION SHALL CONSIST OF PERMANENT GRASS SEED MIXTURE OR SOD THAT IS INSTALLED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS. ALL SLOPES 3:1 AND GREATER SHALL BE RECEIVE SOIL STABILIZATION IN ACCORDANCE WITH THE SPECIFICATIONS.
6. WHERE STREAM CROSSINGS ARE REQUIRED FOR EQUIPMENT, TEMPORARY CULVERTS SHALL BE PROVIDED.
7. FOR FURTHER REQUIREMENTS AND DETAILS OF TREE PRESERVATION, PLANTING, EROSION AND SEDIMENT CONTROL, SEE COUNTY CONSTRUCTION STANDARDS AND SPECIFICATIONS AND/OR THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK.

GENERAL EROSION AND SEDIMENT CONTROL NOTES

1. UNLESS OTHERWISE INDICATED, ALL VEGETATIVE AND STRUCTURAL EROSION AND SEDIMENT CONTROL PRACTICES WILL BE CONSTRUCTED AND MAINTAINED ACCORDING TO THE MINIMUM STANDARDS AND SPECIFICATIONS OF THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK AND VIRGINIA REGULATIONS VR 625-02-00 EROSION AND SEDIMENT CONTROL REGULATIONS.
2. THE PLAN APPROVING AUTHORITY MUST BE NOTIFIED ONE WEEK PRIOR TO THE PRE-CONSTRUCTION CONFERENCE, ONE WEEK PRIOR TO THE COMMENCEMENT OF LAND DISTURBING ACTIVITY, AND ONE WEEK PRIOR TO THE FINAL INSPECTION.
3. ALL EROSION AND SEDIMENT CONTROL MEASURES ARE TO BE PLACED PRIOR TO OR AS THE FIRST STEP IN CLEARING.
4. A COPY OF THE APPROVED EROSION AND SEDIMENT CONTROL PLAN SHALL BE MAINTAINED ON THE SITE AT ALL TIMES.
5. PRIOR TO COMMENCING LAND DISTURBING ACTIVITIES IN THE AREAS OTHER THAN INDICATED ON THESE PLANS (INCLUDING, BUT NOT LIMITED TO, OFF-SITE BORROW OR WASTE AREAS), THE CONTRACTOR SHALL SUBMIT A SUPPLEMENTARY EROSION AND SEDIMENT CONTROL PLAN TO THE OWNER FOR REVIEW AND APPROVAL BY THE PLAN APPROVING AUTHORITY.
6. THE CONTRACTOR IS RESPONSIBLE FOR INSTALLATION OF ANY ADDITIONAL EROSION AND SEDIMENT CONTROL MEASURES NECESSARY TO PREVENT EROSION AND SEDIMENTATION AS DETERMINED BY THE PLAN APPROVING AUTHORITY.
7. ALL DISTURBED AREAS ARE TO DRAIN TO APPROVED SEDIMENT CONTROL MEASURES AT ALL TIMES DURING LAND DISTURBING ACTIVITIES AND DURING SITE DEVELOPMENT UNTIL FINAL STABILIZATION IS ACHIEVED.
8. DURING DEWATERING OPERATIONS, WATER WILL BE PUMPED INTO AN APPROVED FILTERING DEVICE.
9. THE CONTRACTOR SHALL INSPECT ALL EROSION AND SEDIMENT CONTROL MEASURES PERIODICALLY AND AFTER EACH RUNOFF-PRODUCING RAINFALL EVENT. ANY NECESSARY REPAIRS OR CLEANUP TO MAINTAIN THE EFFECTIVENESS OF THE EROSION CONTROL DEVICES SHALL BE MADE IMMEDIATELY.
10. ALL BIOFILTERS SHALL BE KEPT OFF-LINE UNTIL CONSTRUCTION IS COMPLETED AND ALL AREAS HAVE BEEN PROPERLY STABILIZED. THIS SHALL BE ACHIEVED BY USING INLET PROTECTION AT THE CURB CUTS AND STORMWATER CATCH BASINS LEADING DIRECTLY INTO THE BIOFILTERS.
11. ALL TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES SHALL BE REMOVED WITHIN 30 DAYS AFTER FINAL SITE STABILIZATION OR AFTER THE TEMPORARY MEASURES ARE NO LONGER NEEDED.

PRE-STORM EROSION & SEDIMENTATION CHECKLIST:

PER GENERAL EROSION AND SEDIMENT CONTROL NOTE 6, THE CONTRACTOR IS RESPONSIBLE FOR THE INSTALLATION AND MAINTENANCE OF ANY ADDITIONAL EROSION AND SEDIMENT CONTROL (ESC) MEASURES NECESSARY TO PREVENT EROSION AND SEDIMENTATION AS DETERMINED BY THE COUNTY. THESE SUPPLEMENTARY PRACTICES ARE IN ADDITION TO THOSE SHOWN IN AN EROSION AND SEDIMENT CONTROL PLAN. EROSION AND SEDIMENT CONTROL PRACTICES SHALL BE MODIFIED AS NEEDED TO ENSURE ONLY CLEAR WATER IS DISCHARGED FROM THE SITE.

THE FOLLOWING ACTIONS SHALL BE TAKEN PRIOR TO STORM EVENTS WITH PREDICTED HEAVY AND/OR LARGE VOLUME RAINFALL TO PREVENT SEDIMENT DISCHARGES FROM A CONSTRUCTION SITE. A TYPICAL SUMMER THUNDERSTORM IS AN EXAMPLE OF A STORM EVENT WITH PREDICTED HEAVY AND/OR LARGE VOLUME RAINFALL.

1. PERIMETER CONTROLS
   - a. SILT FENCE SHALL BE CHECKED FOR UNDERMINING, HOLES, OR DETERIORATION OF THE FABRIC. FENCING SHALL BE REPLACED IMMEDIATELY IF THE FABRIC IS DAMAGED OR WON. SILT FENCE MUST BE TRENCHED INTO THE GROUND PER STATE SPECIFICATIONS (VESCH STD & SPEC 3.09).
   - b. WOODEN STAKES OR STEEL POSTS SHALL BE PROPERLY SECURED UPRIGHT INTO THE GROUND. DAMAGED POSTS OR STAKES MUST BE REPLACED.
   - c. SEDIMENT THAT HAS ACCUMULATED AGAINST THE SILT FENCE SHALL BE REMOVED. ACCUMULATED SEDIMENT MUST BE REMOVED WHEN THE LEVEL REACHES ONE-HALF THE HEIGHT OF THE FENCING.
   - d. HAY BALES OR A STONE BERM SHALL BE PLACED ACROSS THE CONSTRUCTION ENTRANCE TO PREVENT SEDIMENT FROM LEAVING THE CONSTRUCTION SITE.
2. EXPOSED SLOPES AND SOIL
   - a. EXPOSED SLOPES NOT AT THE FINAL STABILIZATION PHASE SHALL BE COVERED WITH TARPS, PLASTIC SHEETING, OR EROSION CONTROL MATTING. COVERING MATERIAL SHALL BE PROPERLY SECURED/ANCHORED.
   - b. CONTROLS SHALL BE INSTALLED TO PREVENT CONCENTRATED FLOW DOWN AN EXPOSED SLOPE. BERMS OR DIVERSION DIKES SHALL BE INSTALLED AT THE TOP OF CUT/EXPOSED SLOPES TO DIRECT STORM FLOW AROUND THE DISTURBED AREA.
   - c. EXPOSED SLOPES AT THE FINAL STABILIZATION PHASE SHALL BE STABILIZED USING SLOPE STABILIZATION PRACTICES SUCH AS SOIL STABILIZATION BLANKETS OR MATTING AS SPECIFIED IN THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK (VESCH STD & SPEC 3.36). BLANKETS OR MATS MUST BE PROPERLY SECURED AND ANCHORED TO THE SLOPE USING STAPLES, PINS, OR STAKES.
   - d. SEEDED AREAS SHALL BE CHECKED AND RESEEDED AS NECESSARY TO COVER EXPOSED SOIL. RECENTLY SEEDED AREAS SHALL BE PROTECTED BY STRAW OR SOIL STABILIZATION BLANKETS TO PREVENT SEEDING FROM BEING WASHED AWAY.
3. STOCKPILES
   - a. STOCKPILED SOIL AND OTHER LOOSE MATERIALS THAT CAN BE WASHED AWAY SHALL BE COVERED WITH A TARP, PLASTIC SHEETING, OR OTHER STABILIZATION MATTING. THE COVER MUST BE PROPERLY SECURED/ANCHORED DOWN TO PREVENT IT FROM BEING BLOWN OFF AND EXPOSING MATERIALS TO RAIN. CONTROLS SUCH AS HAY BALES OR BOOMS SHALL BE PLACED ALONG THE PERIMETER OF THE STOCKPILE (DOWNHILL SIDE).
4. INLET PROTECTION
   - a. INLET PROTECTION CONTROLS SHALL BE INSPECTED TO ENSURE THEY ARE FUNCTIONING PROPERLY AND FLOODING WILL NOT OCCUR. CLOGGED OR DAMAGED CONTROLS MUST BE REPLACED IMMEDIATELY. ENSURE CONTROLS ALLOW FOR OVERFLOW/BYPASS OF STORMWATER RUNOFF DURING SIGNIFICANT STORM EVENTS.

IN ADDITION TO THESE PRE-STORM ACTIONS, ALL EROSION AND SEDIMENT CONTROL (ESC) MEASURES MUST BE CHECKED DAILY AND AFTER EACH SIGNIFICANT RAINFALL.

POLLUTION PREVENTION PLAN NOTES (STORMWATER MANUAL - SECTION 2.4)

1. ONLY THE FOLLOWING NON-STORMWATER DISCHARGES ARE AUTHORIZED BY ARLINGTON COUNTY'S MS4 PERMIT, UNLESS THE STATE WATER CONTROL BOARD, THE VIRGINIA SOIL AND WATER CONSERVATION BOARD (BOARD), OR ARLINGTON COUNTY DETERMINES THE DISCHARGE TO BE A SIGNIFICANT SOURCE OF POLLUTANTS TO SURFACE WATERS:
   - a. WATER LINE FLUSHING; LANDSCAPE IRRIGATION; DIVERTED STREAM FLOWS; RISING GROUND WATERS; UNCONTAMINATED GROUND WATER INFILTRATION (AS DEFINED AT 40 CFR 35.2005(20)); UNCONTAMINATED PUMPED GROUND WATER; DISCHARGES FROM POTABLE WATER SOURCES; F

N Highland St

TREE INVENTORY AND REPLACEMENT SCHEDULE

Tree #	To Be Removed	DBH	Condition	Species	Common Name	Species Rating	Replacement value	Replacements	Comments
01	X	12	60	Cercis canadensis	Eastern redbud	65	4.68	1	
02		4		Magnolia sp.	Deciduous Magnolia				tree to remain
03		15		Prunus serotina	Black Cherry				tree to remain
04		12		Carpinus caroliniana	Hornbeam				tree to remain
05	X	10	65	Carpinus caroliniana	Hornbeam	80		1	
06	X	10	65	Carpinus caroliniana	Hornbeam	80		1	
07	X	8	65	Carpinus caroliniana	Hornbeam	80		1	poor condition
08		18		Acer palmatum	Japanese Maple				tree to remain
09		4		Acer rubrum	Red Maple				tree to remain
10	X	8	70	Lagerstroemia indica	Crape Myrtle	75	-	1	
11	X	4	70	Lagerstroemia indica	Crape Myrtle	75	-	1	
12		6		Acer rubrum	Red Maple				tree to remain
13		20		Acer rubrum	Red Maple				tree to remain
14	X	10	70	Liquidambar styraciflua	Sweetgum	65	-	1	
15		4		Acer palmatum	Japanese Maple				tree to remain
16	X	4	60	Cornus florida	Flowering Dogwood	60	-	1	
17	X	4	0	-	dead tree	-	-	1	dead
18	X	12	60	Prunus serotina	Black Cherry	60	4.32	1	
19		4		Prunus pendula	Weeping Cherry				tree to remain
20		26		Acer rubrum	Red Maple				tree to remain
21		24		Acer rubrum	Red Maple				tree to remain
22		6		Lagerstroemia indica	Crape Myrtle				tree to remain
23		6		Lagerstroemia indica	Crape Myrtle				tree to remain
24		6		Acer spp.	Maple				tree to remain
25		4		Cornus florida	Flowering Dogwood				tree to remain
26		1	70	Lagerstroemia indica	Crape Myrtle	75	-		tree to remain
27		1	70	Lagerstroemia indica	Crape Myrtle	75	-		tree to remain
28		8		Acer palmatum	Japanese Maple				tree to remain
29		12		Liriodendron tulipifora	Tulip Poplar				tree to remain
30		10		Quercus phellos	Willow Oak				tree to remain
31		4		Quercus rubra	Northern Red Oak				tree to remain
32		3		Cercis canadensis	Eastern Redbud				tree to remain
33		30		Acer saccharinum	Silver Maple				tree to remain
34		7		Prunus spp.	Cherry				tree to remain
35		8		Magnolia grandiflora	Sothern Magnolia				tree to remain
36		40		Quercus falcata	Southern Red Oak				tree to remain
37		48		Quercus alba	White Oak				tree to remain
38		15		Qurcus phellos	Willow Oak				tree to remain
							Total	**10**	

1. Trees with 10 inches DBH and smaller are automatically replaced at a rate of one-for-one according to the policy.
2. DBH shown here provided by County Forester which supercedes tree size shown on existing survey.

NOTES:

1. CONTRACTOR SHALL CONTACT THE ARLINGTON COUNTY FORESTER TO SCHEDULE A PRE-CONSTRUCTION INSPECTION OF TREE PROTECTION MEASURES BEFORE ANY WORK NEAR THE CRITICAL ROOT ZONES OF TREES. TO SCHEDULE THE PRE-CONSTRUCTION MEETING CALL 703-228-1863.
2. CONTRACTOR SHALL PROTECT TREES PER THE PLAN ACCORDING TO THE ARLINGTON COUNTY DPR DESIGN STANDARD DETAIL 311300.1 (SEE SHEET C032.3 FOR DETAIL).
3. CONTRACTOR SHALL ROOT PRUNE TREES PER THE PLAN ACCORDING TO THE ARLINGTON COUNTY DPR DESIGN STANDARD DETAIL 311300.5 (SEE SHEET C032.3 FOR DETAIL).
4. CONTRACTOR SHALL PRUNE ANY TREE BRANCHES WHICH WOULD CONFLICT WITH CONSTRUCTION ACTIVITIES. PRUNING SHALL BE PERFORMED PRIOR TO CONSTRUCTION AND UNDER THE DIRECTION OF THE ARLINGTON COUNTY FORESTER.

ARLINGTON VIRGINIA

DEPARTMENT OF ENVIRONMENTAL SERVICES

FACILITIES & ENGINEERING DIVISION
ENGINEERING BUREAU
2100 CLARENDON BOULEVARD, SUITE 813
ARLINGTON, VA 22201
PHONE: 703.228.3629
FAX: 703.228.3606

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SEAL

COMMONWEALTH OF VIRGINIA
JIONG LIN
Lic. No. 0402051875
04/07/2020
PROFESSIONAL ENGINEER

APPROVALS	DATE
	4/7/2020
QUALITY CONTROL ENGINEER Kamal N. Taktak	4.7.20
CONSTRUCTION MANAGEMENT SUPERVISOR David W. Hundelt	04.14.2020
WATER, SEWER, STREETS BUREAU CHIEF Dennis M. Leach.	04/13/20
TRANSPORTATION DIRECTOR Tim McAntosh	4/16/20
PROJECT MANAGER	

REVISIONS	DATE

PROJECT NAME AND LOCATION
EROSION AND SEDIMENT CONTROL NOTES II

N HIGHLAND STREET
1ST ROAD N
TO ARLINGTON BOULEVARD

Z261

DESIGNED: E CACCAVARI
DRAWN: E CACCAVARI
CHECKED: J LIN
MISS UTILITY TRANSMITTAL #5330

FILENAME: Z261-220-E_AND_S_NOTES_SWPPP.DWG
PATH: Q:\DATA\Z261\DESIGN\CAD\ACTIVE
PLOTTED: JUNE 23 2020
PLOTTED BY: ECACCAVARI

SCALE N/A

SHEET C032.2

Revised: 01/21/2016

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SECTION

NOTES

1. ROOT PRUNING SHALL BE DONE WITH A TRENCHER OR VIBRATORY PLOW TO A DEPTH OF 18". ROOTS OVER 1.5" IN DIAMETER SHALL HAVE A CLEAN CUT MADE BY A CLEAN SAW ON THE SURFACE OF THE ROOT, WHICH IS STILL ATTACHED TO THE TREE. DO NOT BREAK OR CHOP. DO NOT PAINT THE CUT ROOT END. IF EXCAVATION IS FOR INSTALLATION OF UNDERGROUND UTILITIES, LEAVE THE ROOT INTACT AND THREAD THE LINES UNDERNEATH.

2. ROOT PRUNING SHALL TAKE PLACE PRIOR TO ANY CLEARING AND GRADING. EXACT LOCATION OF TREE PROTECTION AREAS SHALL BE STAKED OR FLAGGED PRIOR TO TRENCHING AND SHALL BE APPROVED BY ARLINGTON COUNTY URBAN FORESTER.

3. ROOT PRUNING SHALL BE CONDUCTED WITH THE SUPERVISION OF AN ISA CERTIFIED ARBORIST.

4. BACKFILL THE ROOT-PRUNING TRENCH WITH APPROVED LOOSE TOPSOIL MIX AND TOP WITH 3-4" BARK MULCH AND MARK LOCATION FOR FUTURE REFERENCE. SILT FENCE MAY BE INSTALLED IN TRENCH PRIOR TO BACKFILLING AS LONG AS THE TRENCH IS NOT OPEN FOR LONGER THAN 48 HOURS WITHOUT WATERING.

5. ROOT PRUNING WORK SHALL NOT BE DONE WHEN MORE THAN THE TOP 1 INCH OF SOIL IS FROZEN. ROOT PRUNING SHALL NOT BE UNDERTAKEN WHEN THE SOIL IS WET AND CONDITIONS ARE MUDDY.

6. THE ARLINGTON COUNTY URBAN FORESTER SHALL BE NOTIFIED 72 HOURS PRIOR TO TRENCHING AND WHEN ALL ROOT PRUNING AND TREE PROTECTION FENCE INSTALLATION IS COMPLETE.

ROOT PRUNING

311300.5 (2016) (02231.5)

N.T.S.

ARLINGTON DPR

GRAVEL AND WIRE MESH DROP INLET SEDIMENT FILTER

SPECIFIC APPLICATION

THIS METHOD OF INLET PROTECTION IS APPLICABLE WHERE HEAVY CONCENTRATED FLOWS ARE EXPECTED BUT NOT WHERE PONDING AROUND THE STRUCTURE MIGHT CAUSE EXCESSIVE INCONVENIENCE OR DAMAGE TO ADJACENT STRUCTURES AND UNPROTECTED AREAS.

* GRAVEL SHALL BE VDOT #3, #357 OR #5 COARSE AGGREGATE.

SOURCE: VA. DSWC

PLATE. 3.07-2

NOTES

1. DIMENSIONAL LUMBER SIZES SHOW.
2. GRAVEL SHALL BE VDOT COARSE AGGREGATE #3, # 357 OR #5.
3. WEIR HEIGHT MAY BE ADJUSTED BY PROJECT OFFICER OR INSPECTOR IN FLOOD PRONE AREAS.
4. PAINT 2"X4" WEIR, CLOSED BASKET, AND GUTTER WITH HIGH VISIBILITY INCANDESCENT ORANGE PAINT.
5. REMOVE SEDIMENT AFTER EACH RAIN EVENT TO MAINTAIN FUNCTION AND AVOID PREMATURE CLOGGING. IF INLET PROTECTION DOES NOT COMPLETELY DRAIN WITHIN 24 HOURS AFTER A STORM EVENT, IT IS CLOGGED. WHEN THIS OCCURS, REMOVE ACCUMULATED SEDIMENT AND CLEAN, OR REPLACE THE PROTECTION.

CURB INLET PROTECTION

REVISION & DATE

ARLINGTON VIRGINIA

ARLINGTON COUNTY, VIRGINIA
DEPARTMENT OF ENVIRONMENTAL SERVICES

DRAWING NO. 3.07-7 (ACG)

NOTES:
1. TREE PROTECTION FENCE (TPF) SHALL BE INSTALLED PRIOR TO ANY SITE WORK, CLEARING OR DEMOLITION. ARLINGTON COUNTY URBAN FORESTER SHALL BE NOTIFIED 72 HOURS PRIOR TO INSTALLATION OR ANY OTHER TREE PRESERVATION MEASURE SPECIFIED IN PLANS AND SHALL APPROVE LAYOUT.
2. NO PERSONNEL, VEHICLES, EQUIPMENT, CONSTRUCTION MATERIALS OR DEBRIS ALLOWED IN TREE PROTECTION AREAS WITHOUT WRITTEN CONSENT OF ARLINGTON COUNTY URBAN FORESTER.
3. REMOVE TPF ONLY WITH APPROVAL FROM ARLINGTON COUNTY URBAN FORESTER AFTER ALL SITE WORK HAS BEEN COMPLETED.
4. SIGN MATERIAL TO BE WEATHER RESISTANT.

ELEVATION

6' CHAIN LINK TREE PROTECTION FENCE

311300.1 (2016) (02231.1)

1/2" = 1'-0"

ARLINGTON DPR

1992 3.05

CONSTRUCTION OF A SILT FENCE (WITHOUT WIRE SUPPORT)

Source: Adapted from Installation of Straw and Fabric Filter Barriers for Sediment Control, Sherwood and Wyant

Plate 3.05-2

III - 25

1992 3.26

PORTABLE SEDIMENT TANK

Source: USDA-SCS

Plate 3.26-1

III - 240

ARLINGTON VIRGINIA

DEPARTMENT OF ENVIRONMENTAL SERVICES

FACILITIES & ENGINEERING DIVISION
ENGINEERING BUREAU
2100 CLARENDON BOULEVARD, SUITE 813
ARLINGTON, VA 22201
PHONE: 703.228.3629
FAX: 703.228.3606

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SEAL

COMMONWEALTH OF VIRGINIA
JIONG LIN
Lic. No. 0402051875
04/07/2020
PROFESSIONAL ENGINEER

APPROVALS	DATE
	4/7/2020
QUALITY CONTROL ENGINEER Kamal N. Taktak	4.7.20
CONSTRUCTION MANAGEMENT SUPERVISOR David W. Hundelt	04.14.2020
WATER, SEWER, STREETS BUREAU CHIEF Dennis M. Leach.	04/13/20
TRANSPORTATION DIRECTOR Tim McAntosh	4/16/20
PROJECT MANAGER	

REVISIONS	DATE

PROJECT NAME AND LOCATION
EROSION AND SEDIMENT DETAILS

N HIGHLAND STREET
1ST ROAD N
TO ARLINGTON BOULEVARD
Z261

DESIGNED: E CACCAVARI
DRAWN: E CACCAVARI
CHECKED: J LIN
MISS UTILITY TRANSMITTAL #5330

FILENAME: Z261-220-E_AND_S_NOTES_SWPPP.DWG
PATH: Q:\DATA\Z261\DESIGN\CAD\ACTIVE
PLOTTED: JUNE 23 2020
PLOTTED BY: ECACCAVARI

SCALE N/A

SHEET C032.3

Revised: 01/21/2016

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STORMWATER POLLUTION PREVENTION PLAN (SWPPP)
Arlington County Projects
(Linear Development / Stormwater Retrofit)

For Construction Activities At:

Street Improvement Project / N Highland St.
Between Arlington Blvd and 1st Rd N
Arlington, VA 22201

Latitude: 38.873108 N (decimal degrees)

Longitude: -77.092071 W (decimal degrees)

Construction Activity Operator:

TBD

SWPPP Preparation Date:

September 11, 2019

CERTIFICATION

"I certify under penalty of law that I have read and understand this document 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."

Operator Name: _____

Title: _____

Signature: _____

Date: _____

NOTE: SWPPP SHALL BE COMPLETED/SIGNED BY CONTRACTOR PRIOR TO CONSTRUCTION.

1.0 SWPPP Documents Located Onsite & Available for Review

SWPPP Document Type	Located Onsite & Available for Review?	
Registration Statement	☐ Yes	☒ NA
Notice of Coverage Letter	☐ Yes	☒ NA
Construction General Permit	☐ Yes	☒ NA
Pollution Prevention Plan	☒ Yes	☐ NA
Erosion & Sediment Control Plan	☒ Yes	☐ NA
Stormwater Management Plan	☒ Yes	☐ NA
LDA Permit	☒ Yes	☐ NA

Required documents must be kept at a centralized location on the project site (i.e. in a mail box or other container)

2.0 Authorized Non-Stormwater Discharges

Type of Authorized Non-Stormwater Discharges	Likely Present at Your Project Site?	
Uncontaminated excavation dewatering	☒ Yes	☐ No
Landscape irrigation	☒ Yes	☐ No
Others [describe]	☐ Yes	☒ No

3.0 Pollution Prevention Awareness

Employees will be given a "walk through" of the site identifying areas of possible pollution and will be shown Erosion and Sediment Controls and Pollution Prevention Practices (identified in Sections 4.0 and 5.0 of this SWPPP) that are applicable to their assigned job duties. A refresher meeting and "walk through" will be conducted on an as needed basis.

4.0 Erosion & Sediment Controls

Select all that apply	Erosion & Sediment Control	Estimated Installation Date	Estimated Removal Date	Responsible Party
☐	Construction Entrance (Std. & Spec. 3.02)			Construction Activity Operator (See Cover Page)
☒	Silt Fence (Std. & Spec. 3.05)			
☒	Culvert Inlet Protection (Std. & Spec. 3.08)			
☐	Outlet Protection (Std. & Spec. 3.18)		NA	
☒	Temporary Seeding (Std. & Spec. 3.31)	As required	NA	
☐	Permanent Seeding (Std. & Spec. 3.32)		NA	
☒	Sodding (Std. & Spec. 3.33)		NA	
☐	Mulching (Std. & Spec. 3.35)		NA	
☐	Safety Fence (Std. & Spec 3.01)			
☒	Storm Drain Inlet Protection			

	(Std. & Spec 3.08 and/or Arlington County Std. & Spec from approved ESC plan)			
☒	Dewatering (Std. & Spec 3.26 and/or Arlington County Std. & Spec from approved ESC plan)			
☐	Turbidity Curtain (Std. & Spec 3.27 and/or Arlington County Std. & Spec from approved ESC plan)			
☒	Tree Protection (Arlington County Std. & Spec from approved ESC plan)			
☐	Stream Crossing / Cofferdams (Std. & Spec 3.25 or on plan)			
☐	Pump Around System (detail on approved plan)			
☐	Rip Rap (Std. & Spec. 3-19)			
☐	Other(s) [describe]			

Pre-Storm Erosion and Sediment Control Checklist

The following actions shall be taken prior to storm events with predicted heavy and/or large volume rainfall to prevent sediment discharges from a construction site. A typical summer thunderstorm is an example of a storm event with predicted heavy and/or large volume rainfall.

☐ Perimeter controls (silt fence, hay bales, stone berms) used to prevent sediment from leaving the site shall be checked for undermining, holes, or deterioration and repaired/replaced if needed.

☐ Sediment that has accumulated against perimeter controls shall be removed if the depth exceeds more than 1/2 of the silt fence height.

☐ Exposed soil or slopes shall be covered with straw, tarps, plastic sheeting, or erosion control matting. Covering material shall be properly secured/anchored.

☐ Stockpiled soil and other loose materials that can be washed away shall be covered with a tarp, plastic sheeting, or other stabilization matting. The cover must be properly secured / anchored down to prevent it from being blown off and exposing materials to rain. Controls such as hay bales or booms should be placed along the perimeter of the stock pile (downhill side). Stockpiled materials should not obstruct flow along the curb line.

☐ Inlet protection controls shall be inspected to ensure they are installed per approved ESC plan, are functioning properly, and maintained as needed.

5.0 Potential Sources of Pollution & Pollution Prevention Practices

Pollutant-Generating Activity	Likely Present at your Project Site?	Pollutants: Sediment	Nutrients	Heavy Metals	pH (acids and bases)	Pesticides & Herbicides	Oil & Grease	Bacteria & Viruses	Trash, Debris, Solids	Other Toxic Chemicals	Pollution Prevention Practice	Responsible Party
Clearing, grading, excavating, and un-stabilized areas	☒ Yes ☐ No	X	X						X		(1)	Construction Activity Operator (See Cover Page of this SWPPP)
Paving and saw cutting operations	☒ Yes ☐ No	X					X		X		(2)	
Concrete operations, washout, and cement waste	☒ Yes ☐ No			X	X				X		(3)	
Washing / cleaning	☒ Yes ☐ No	X	X	X	X		X		X	X	(4)	
Dewatering operations	☒ Yes ☐ No	X	X						X		(5)	
Material / chemical use and storage	☒ Yes ☐ No	X	X	X	X	X	X		X	X	(6)	
Equipment and vehicle maintenance	☒ Yes ☐ No				X		X		X	X	(7)	
Waste management / disposal	☒ Yes ☐ No								X	X	(8)	
Sanitary waste	☐ Yes ☒ No		X		X			X			(9)	
Nutrient management	☐ Yes ☒ No	X	X						X	X	(10)	

Pollution Prevention Practices:

(1) **Clearing, grading, excavating, and un-stabilized areas** – Maintain as much existing vegetation as practicable. Utilize erosion and sediment controls to prevent sediment from leaving the construction site. Dispose of clearing debris at acceptable disposal sites. Apply permanent or temporary stabilization, sodding and/or mulching to denuded areas in accordance with the erosion and sediment control specifications and the general VPDES permit for discharges of stormwater from construction activities. Plastic sheeting, tarps, 2" deep straw cover, and/or erosion matting can be used for temporary slope stabilization.

(2) **Paving and saw cutting operations** – Cover storm drain inlets during paving and saw cutting operations. Use pollution prevention materials such as drip pans and absorbent/oil dry for all paving machines to limit leaks and spills of paving materials and fluids. Slurry from saw cutting operations may not enter a storm drain; it must be captured and disposed of properly.

Temporary controls (i.e. tarp and block, sand berms, booms, and/or filter fabric) shall be used to cover storm drains during paving and saw cutting operations to prevent any discharges from entering the storm drain. These temporary controls SHALL BE REMOVED AT THE END OF EACH DAY. Inlet protection specified in the approved ESC plan shall be installed or reinstalled following the completion of paving or saw cutting work.

☐	Method of covering / protecting storm drains:
☐	Method for containment, collection, disposal of saw cut surry:

(3) **Concrete operations, washout, and cement waste** – Direct concrete wash water into a leak-proof container or leak-proof settling basin that is designed so that no overflows can occur due to inadequate sizing or precipitation. Hardened concrete wastes shall be removed and disposed of in a manner consistent with the handling of other construction wastes.

- ☐ Washouts must be sized appropriately for the needs of the project.
- ☐ Do not locate washouts near storm drains. Concrete wash water is not allowed to enter a storm drain.
- ☐ Concrete washout areas cannot be used for the purpose of dewatering.
- ☐ Set up and operate small mixers on top of plywood that is covered by tarps or heavy plastic drop cloths.
- ☐ Wash out mixers and truck chutes in designated contained washout areas
- ☐ No tracking from washout areas may occur.
- ☐ Place plastic sheeting, boards, or tarps under concrete truck chutes during pouring

The selected concrete wash out facility will be used:

,, Excavated Washout Structure

☐ Washout Structure with Wood Planks

☐ Washout Structure with Straw Bales

☐ Prefabricated Containment System
Type: _____

☐ Other:

(4) **Washing / cleaning** – Prevent the discharge of wash water to the storm drain system or surface waters.

☐ Wash water or liquid wastes may not enter a storm drain or surface waters.

☐ Provide a suitable containment system for cleaning equipment such as a drum, prefabricated system, lined container, or portable wash pad.

☐ The wash / containment area must be sized appropriately for the needs of the project.

☐ Locate wash / containment areas away from storm drains.

(5) **Dewatering operations** – Construction site dewatering may not be discharged without treatment. Sediment laden or turbid water shall be filtered, settled or similarly treated prior to discharge.

☐ Dewatering detail on approved ESC plan will be used.

☐ Dewatering option from Planning & Field Guide for Pollution Prevention (P2):
- ☐ Filter Box
- ☐ Straw Bale/Silt Fence Pit
- ☐ Portable Sediment Tank
- ☐ Filter Bag

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DEPARTMENT OF ENVIRONMENTAL SERVICES
FACILITIES & ENGINEERING DIVISION
ENGINEERING BUREAU
2100 CLARENDON BOULEVARD, SUITE 813
ARLINGTON, VA 22201
PHONE: 703.228.3629
FAX: 703.228.3606

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SEAL
COMMONWEALTH OF VIRGINIA
JIONG LIN
Lic. No. 0402051875
04/07/2020
PROFESSIONAL ENGINEER

APPROVALS	DATE
	4/7/2020
QUALITY CONTROL ENGINEER Kamal N. Taktak	4.7.20
CONSTRUCTION MANAGEMENT SUPERVISOR David W. Hundelt	04.14.2020
WATER, SEWER, STREETS BUREAU CHIEF Dennis M. Leach.	04/13/20
TRANSPORTATION DIRECTOR Tim McAntosh	4/16/20
PROJECT MANAGER	

REVISIONS	DATE

PROJECT NAME AND LOCATION
STORMWATER POLLUTION PREVENTION PLAN I

N HIGHLAND STREET
1ST ROAD N
TO ARLINGTON BOULEVARD

Z261

DESIGNED: E CACCAVARI
DRAWN: E CACCAVARI
CHECKED: J LIN
MISS UTILITY TRANSMITTAL #5330

FILENAME: Z261-220-E_AND_S_NOTES_SWPPP.DWG
PATH: Q:\DATA\Z261\DESIGN\CAD\ACTIVE
PLOTTED: JUNE 23 2020
PLOTTED BY: ECACCAVARI

SCALE N/A

SHEET C035.1

Revised: 01/21/2016

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☐ Pump from Settling Pit
☐ Manufactured System: _____

☐ Other: _____

(6) **Material / chemical use and storage** –Designate areas of the construction site for material delivery and storage. Locate these areas near construction entrances and away from waterways and storm drains. Enclose, cover or berm construction material storage areas if susceptible to stormwater.

☐ Stockpiled soil and other loose materials that can be washed away shall be covered with a tarp, plastic sheeting, or other stabilization matting. The cover must be properly secured / anchored down to prevent it from being blown off and exposing materials to rain. Controls such as hay bales or booms should be placed along the perimeter of the stock pile (downhill side).

Stockpiled materials located on the edge of roadways should not obstruct flow along the curb line (gutter). Leave at least a one (1) foot space away from the curb to allow stormwater to flow along the curb line. Boards with cinder blocks and/or bricks may be used to create the flow through space.

☐	Method used to ensure flow through:

☐ Provide secondary containment for paint, pesticides, cleaners, solvents, and/or other chemicals and keep these items secured and covered when not in use

☐ Regularly inspect containers.

(7) **Equipment and vehicle maintenance –** Use a designated area, away from storm drains and surface waters, to refuel vehicle or equipment or perform maintenance.

☐ Regularly inspect vehicles and equipment for leaks. Clean up all spills and leaks upon discovery.

☐ Use containment measures when conducting fueling (e.g. place spill pad, board, plastic sheeting on ground)

☐ Regularly inspect fuel containers.

☐ Provide secondary containment and secure storage for fuel, oil, and/or lubricants

☐ Keep drip pans, sheeting, and/or absorbent pads under heavy equipment when not in use (i.e. overnight) to capture leaks.

(8) **Waste management / disposal** – Designate a waste collection area on the construction site that does not receive a substantial amount of runoff from upland areas and does not drain directly to a waterway. Ensure that waste containers have lids so they can be covered before periods of rain. Schedule waste collection to prevent the containers from overfilling.

☐ A sufficient number of waste containers must be kept on a site to handle the quantity of waste produced.

☐ Keep roll off containers covered and/or dumpster / trash lids closed.

☐ Check waste containers frequently for damage / leaks and clean using DRY methods when necessary. Never clean out a dumpster by power washing or hosing it out.

☐ Replace containers that are leaking, cracked, corroded, or otherwise deteriorating.

☐ Do not bury waste material. Dispose of excess dry concrete, grout and mortar in the trash.

(9) **Sanitary waste** – Prevent the discharge of sanitary waste by providing convenient and well-maintained portable sanitary facilities.

☐ Locate portable lavatories away from storm drains and surface waters.

☐ Keep portable lavatories level and provide secondary containment (i.e. trays)

☐ Regularly inspect facilities for leaks

☐ Schedule routine maintenance

(10) **Nutrient management** – Apply nutrients in accordance with manufacturer's recommendations. Do not apply during rainfall events or windy conditions. Provide secondary containment and keep fertilizer properly secured when not being used.

Additional information and details can be found in the Arlington County Planning & Field Guide for Pollution Prevention (P2).

6.0 Stormwater Management Controls

Select all that apply	Stormwater Management Control	Estimated Installation Date	Responsible Party
☐	Exempted – stormwater management retrofit facility or stream restoration project	NA	NA
☐	Linear development project per Arlington County Chesapeake Bay Total Maximum Daily Load (TMDL) Action Plan[1]	NA	NA
☐	Post-development Stormwater Management Controls provided by a Larger Common Plan of Development or Sale	NA	Common Plan Construction Activity Operator
☐	Rooftop Disconnection		Construction Activity Operator

[1] *In accordance with Arlington County's Chesapeake Bay Total Maximum Daily Load (TMDL) Action Plan, approved by the Virginia Department of Environmental Quality (DEQ) on September 1, 2015, linear development projects conducted by the County are administered and tracked as follows consistent with 9VAC25-870-69.A.4, 9VAC25-870-76, and 9VAC25-870-92:*

- *Pollutant load changes will be computed as described in Section 3.A of the Action Plan.*
- *Retrofit opportunities will be evaluated for each project, using the screening and selection criteria applied and described in the adopted Stormwater Master Plan.*
- *Retrofit projects that meet the screening criteria and are determined by Arlington to be feasible and cost-effective will be implemented with specific linear development projects. Pollutant load reductions from retrofit projects will be computed as described in Section 5 of the Action Plan.*
- *In cases where retrofit projects are not feasible and cost-effective for a particular linear project, any POC load increases that might occur for that project will be addressed by larger overall POC load reductions in place or added through TMDL action plan implementation.*

In the above manner Arlington, as the MS4 operator and the construction site operator for its linear development projects, implements linear projects and retrofit projects in a manner that achieves the most TMDL POC reduction for the least cost, while fully accounting for load changes that occur with linear development project activity consistent with the DEQ Chesapeake Bay TMDL Special Condition Guidance.

☐	Sheet flow to Vegetated Filter (1 or 2)		(See Cover Page of this SWPPP)
☐	Grass Channel		
☐	Rainwater Harvesting		
☐	Permeable Pavement (1 or 2)		
☐	Infiltration (1 or 2)		
☐	Bio-retention (1 or 2)		
☐	Others [describe]		

7.0 Spill Prevention & Response

Most spills can be cleaned up using a spill kit. Absorbent/oil dry, sealable containers, plastic bags, and shovels/brooms are suggested minimum spill response items that should be available at the project site.

1st Priority: Protect all people
2nd Priority: Protect equipment and property
3rd Priority: Protect the environment

1. Check for hazards (flammable material, noxious fumes, cause of spill) – if flammable liquid, turn off engines and nearby electrical equipment. If serious hazards are present leave the area and call 911. LARGE SPILLS ARE LIKELY TO PRESENT A HAZARD.
2. Ensure the spill area is safe to enter and that it does not pose an immediate threat to health or safety of any person.
3. Stop the spill source.
4. Call co-workers and supervisor for assistance and to make them aware of the spill and potential dangers.
5. If possible, stop spill from spreading and/or entering storm drains (use absorbent or other materials as necessary).
6. If spilled material has entered a storm drain; contact Arlington County Fire Department and project manager.
7. Clean up spilled material according to manufacturer specifications, for liquid spills use absorbent materials and do not flush area with water.
8. Properly dispose of cleanup materials and used absorbent material according to manufacturer specifications.

Emergency Contacts:

Local Contacts

Arlington County Fire & Police	703-558-2222
DES Water, Sewer, Streets 24-Hour Emergency	703-228-6555
Washington Gas Emergency	703-750-1400

Nights, Holidays & Weekends

VA Dept. of Emergency Management	804-674-2400
24 Hour Reporting Service	

Spill kit on site: ☐ Yes ☐ No

Location(s) of spill kit: _____

8.0 Self Inspection Report & Corrective Action Log (make additional copies as necessary)

Company/Organization:
Name of Inspector
Telephone Number:
Qualifications:

Inspection Schedule

Discharges to impaired waters, surface waters within a TMDL watershed, or exceptional waters:

☒ Once every 4 business days

Inspection Date: _____

Describe phase of construction: _____

Is a copy of the SWPPP available on site? ☐ Yes ☐ No Is the SWPPP complete? ☐ Yes ☐ No

Erosion & Sediment Controls/ Pollution Prevention Practices	In Compliance?	Corrective Action Needed & Notes	Date Corrective Action Taken
Are controls in place to prevent sediment from being tracked off site or onto the street?	☐ Yes ☐ No ☐ NA		
Are perimeter controls adequately installed and properly maintained?	☐ Yes ☐ No ☐ NA		
Are storm drains properly protected / approved inlet protection is in place?	☐ Yes ☐ No ☐ NA		
Are all slopes and disturbed areas, including stockpiles, not actively being worked properly stabilized?	☐ Yes ☐ No ☐ NA		
Are dewatering operations working properly?	☐ Yes ☐ No ☐ NA		
Is construction dust properly controlled?	☐ Yes ☐ No ☐ NA		
Are mature trees and/or natural areas properly protected?	☐ Yes ☐ No ☐ NA		

Are washout facilities (concrete, paint) available, labeled, and properly maintained?	☐ Yes ☐ No ☐ NA		
Are trash and waste materials properly managed and disposed of?	☐ Yes ☐ No ☐ NA		
Are trash receptacles covered and not leaking?	☐ Yes ☐ No ☐ NA		
Are non-stormwater discharges (i.e. wash water, saw cut slurry) properly managed?	☐ Yes ☐ No ☐ NA		
Are vehicle and equipment fueling, maintenance, and/or staging areas free of spills and leaks?	☐ Yes ☐ No ☐ NA		
Are materials that are potential stormwater contaminants stored properly (covered / have secondary containment)?	☐ Yes ☐ No ☐ NA		
Are portable lavatories level, in good condition, and located away from storm drains?	☐ Yes ☐ No ☐ NA		
Is a spill kit accessible onsite?	☐ Yes ☐ No ☐ NA		

Are there any unauthorized discharges at the time of this inspection? ☐ Yes ☐ No
If yes, describe:

Has any unauthorized discharge occurred since the last inspection? ☐ Yes ☐ No
If yes, describe:

Non – Compliance Issues
Describe any incidents of non-compliance not described above (use another page if necessary)

Certification
"I certify under penalty of law that I have read and understand this document 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."

Operator or Assigned Qualified Personnel Name: _____

Signature: _____

Date: _____

ARLINGTON
VIRGINIA

DEPARTMENT OF ENVIRONMENTAL SERVICES
FACILITIES & ENGINEERING DIVISION
ENGINEERING BUREAU
2100 CLARENDON BOULEVARD, SUITE 813
ARLINGTON, VA 22201
PHONE: 703.228.3629
FAX: 703.228.3606

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COMMONWEALTH OF VIRGINIA
JIONG LIN
Lic. No. 0402051875
04/07/2020
PROFESSIONAL ENGINEER

APPROVALS	DATE
	4/7/2020
QUALITY CONTROL ENGINEER Kamal N. Taktak	4.7.20
CONSTRUCTION MANAGEMENT SUPERVISOR David W. Hundelt	04.14.2020
WATER, SEWER, STREETS BUREAU CHIEF Dennis M. Leach.	04/13/20
TRANSPORTATION DIRECTOR Tim McAntosh	4/16/20
PROJECT MANAGER	

REVISIONS	DATE

PROJECT NAME AND LOCATION
STORMWATER POLLUTION PREVENTION PLAN II

N HIGHLAND STREET
1ST ROAD N
TO ARLINGTON BOULEVARD

Z261

DESIGNED: E CACCAVARI
DRAWN: E CACCAVARI
CHECKED: J LIN
MISS UTILITY TRANSMITTAL #5330

FILENAME: Z261-220-E_AND_S_NOTES_SWPPP.DWG
PATH: Q:\DATA\Z261\DESIGN\CAD\ACTIVE
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PLOTTED BY: ECACCAVARI

SCALE N/A

SHEET C035.2

Revised: 01/21/2016

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STORMWATER POLLUTION PREVENTION PLAN

9.0 Grading & Stabilization Activities Log

Date Grading Activity Initiated	Description of the Grading Activity (including location)	Date Grading Activity Ceased	Date Stabilization Measures Initiated	Description of the Stabilization Measure (including location)

10.0 SWPPP Modification & Update Log

Modification Date	Description of the Modification / Update	Modification Prepared By (name & title)

INSTRUCTIONS for COMPLETING the SINGLE FAMILY RESIDENCE, COMMON PLAN of DEVELOPMENT or SALE STORMWATER POLLUTION PREVENTION PLAN (SWPPP)

General
A Stormwater Pollution Prevention Plan (SWPPP) must be developed prior to obtaining locality (e.g., City, County, Town) authorization to commence land disturbance.

SWPPP Cover Page
For a construction activity, enter the project/site name and physical address (if available), including city (or town), state and zip code. Enter the latitude and longitude in decimal degrees of the construction activity.

Enter the Construction Activity Operator's company/organization name, the Operator's name and mailing address, including city (or town), state, and zip code, telephone number, email address (if available), and a 24-hour emergency contact.

Enter the SWPPP preparation date.

The Construction Activity Operator identified on the cover page of the SWPPP is responsible for certifying the information contained therein. Please sign the certification in INK. Please note that state statues require the SWPPP to be signed as follows:
(1) For a corporation: by a responsible corporate officer;
(2) For a partnership or sole proprietorship: by a general partner or the proprietor, respectively;
(3) For a municipality, state, federal, or other public agency: by either a principal executive officer or ranking elected official.

Section 1.0 SWPPP Documents Located Onsite & Available for Review
Utilize the provided checklist to ensure that the required SWPPP documents are located onsite and are available for review, if applicable.

Section 2.0 Authorized Non-Stormwater Discharges
Identify the authorized non-stormwater discharges likely to be present at the project site. If an unlisted authorized non-stormwater discharge is likely to be present at the project site, provide it here.

Section 3.0 Pollution Prevention Awareness
Provide employees with a "walk through" of the project site and identify areas of possible pollution, erosion and sediment controls, and pollution prevention practices which are applicable to their assigned job duties. Conduct refresher meetings and perform additional "walk throughs" on an as needed basis.

Section 4.0 Erosion & Sediment Controls
Identify the erosion and sediment controls to be implemented at the project site. For each erosion and sediment control, enter the estimated installation date and estimated removal date. If an unlisted erosion and sediment control will be implemented at the project site, provide the applicable information here.

Section 5.0 Potential Sources of Pollution & Pollution Prevention Practices
Identify the pollutant-generating activities likely to be present at the project site; implement and maintain the corresponding pollution prevention practices. If an unlisted pollutant-generating activity is likely to be present at the project site, describe it, identify the associated pollutant(s), and provide the corresponding pollution prevention practice(s) to be implemented and maintained.

Section 6.0 Stormwater Management Controls
Identify the stormwater management controls to be implemented at the project site, if applicable. For each stormwater management control, enter the estimated installation date. If an unlisted stormwater management control will be implemented at the project site, provide the applicable information here.

Section 7.0 Spill Prevention & Response
Most spills can be cleaned up following manufacturer specifications. The priority should be to protect all people, equipment, property, and the environment. Enter the telephone number of your local fire and police departments.

Section 8.0 Inspections & Corrective Action Log
Enter the qualified inspector's company/organization name, the inspector's name, telephone number, and qualifications. Select the applicable inspection schedule, enter the construction activity inspection date, and enter the date and rainfall amount of the last measurable storm event (if applicable). Identify if the implemented best management practices are in compliance with the SWPPP. Enter corrective actions needed; the party responsible for implementing the corrective actions, and the date corrective actions were taken, if applicable. Make additional copies of the inspection and corrective action log as necessary.

Section 9.0 Grading & Stabilization Activities Log
Enter the date grading activities were initiated, a description of the grading activities including location, the date grading activities ceased, the date stabilization measures were initiated, and a description of the stabilization measures including location.

Section 10.0 SWPPP Modification & Update Log
Enter the SWPPP modification date, description of the SWPPP modification/update, and the name and title of the SWPPP modification preparer, if applicable.

10-11-2019
date

Qianqian Li, P.E.
ESC Program Administrator
Department of Environmental Sevices
2100 Clarendon Boulevard, Suite 813
Arlington, Virginia 22201

Re: Erosion and Sediment Control Permit Application for:

N HIGHLAND ST
street address

BETWEEN ARLINGTON BLVD AND 1ST RD N
lot, block, section subdivision

LDA19215
permit number

Dear Mrs. Li:

I hereby certify that I accept the responsibilities of Responsible Land Disturber for the above referenced project. I understand that these responsibilities include:

1. Reviewing the erosion and sedimentation (E&S) plan for the project.
2. Walking the site prior to construction to identify critical areas.
3. Conducting a pre-construction briefing with earth moving and site contractors to present the E&S plan and highlight the presence of critical areas, the limits of clearing and the required E&S controls and tree protection measures to be installed. Call 703-228-0760 to schedule pre-construction meeting.
4. Regularily inspecting the site during construction to ensure that all E&S controls are functioning and are adequate to address erosion and sedimentation. Inspect the site 48 hours after a runoff-generating storm, and provide a copy of the inspection findings to the county.
5. Reporting to the owner the presence inadequate or non functioning E&S controls when they are observed.
6. Ensuring that temporary soil stabilization is applied within 7 days to areas denuded that will remain undisturbed for longer than 14 days. Permanent stabilization shall be applied to areas that are to be left dormant for more than one year.
7. Calling (703) 228-0760 at least 80 hours before demolishing any structure.

I may be reached at 703-228-0784 with questions about this plan or my execution of the duties of

telephone number
Responsible Land Disturber.

Sincerely,

signed

Jiong Lin
name printed

VA-PE0402051875
professional registration (type and number)

NOTE:
This RLD signed by Jiong Lin for plan review purposes only. Contractor shall sign and accept RLD responsibilities prior to construction nullifying this RLD signature.

ARLINGTON VIRGINIA

Department of Environmental Services
LDA Permit SWPPP Minimum Acceptance Criteria (MAC) Checklist

February 2018

Instructions: Complete this required Front Counter Minimum Acceptance Criteria (MAC) Checklist to ensure the intake of your plan upon submission at 1st submission. If applicable, also complete all attached MAC Checklists for requirements pertaining to the individual review of plan elements.

Project Name: N Highland St Street Improvement Project (Z261)

Address: Arlington , VA 22201 | **Date: 09/29/19**

	General Items	yes	n/a	no	sheet
1	Completion of this Front Counter MAC Checklist and all applicable Plan Review MAC Checklists.	X			
2	Submit and sign the MAC Checklist with the civil engineering plan for first submittal only.	X			
3	Include a Cover Sheet with the following information				
a	Name of project	X			C000.1
b	Include the address, if known at the time of submission.	X			C000.1
c	Vicinity Map indicating the North arrow; label all streets	X			C000.1
d	Name, address, phone number and email of Contractor	X			C000.1
e	Name, address, phone number and email of Owner	X			C000.1
f	Name, address, phone number and email of Engineer	X			C000.1
g	Table of Contents/ Sheet Index	X			C000.1
h	Horizontal Datum: All plans shall be referenced to the Virginia Coordinate System of 1983 (VCS 83). The following note should be present on the cover sheet: "The site shown hereon is referenced to the Virginia Coordinate System of 1983 as computed from a field run boundary and horizontal control survey."	X			C011.1
i	Vertical Datum: All plans shall be referenced to the North American Vertical Datum of 1988 (NAVD 88). The following note should be present on the cover sheet: "The site shown hereon is referenced to the North American Vertical Datum of 1988 as computed from a field run vertical control survey."	X			C011.1
j	Site plan/use permit number and/or which FBC if the project is pursuant to a 4.1 site plan, or a use permit, or a Form Based Code project.			X	
4	Include an Existing Conditions Plan Sheet, Demolition Plan Sheet and Site Plan Sheet	X			C011.1 C021.1, C041.1 - C041.6
5	Include the following within the Plan, on applicable Plan Sheets				
a	Graphic Scale on ALL plan sheets	X			ALL
b	North Arrow on ALL plan sheets	X			ALL
c	Current Field Survey Topography (certified)	X			C011.1
d	Site Areas (Post Dedication and Post Vacation)			X	
e	Total site area of property in sq ft and acres	X			C032.1
f	Existing and Proposed Easements on an exhibit	X			C011.1, C041.1- C041.6

g	Real Property Identification Map Number, RPC Numbers	X			C011.1
h	Legends	X			C006.1
6	Engineer's Seal/ Signature - Signed and dated on all sheets				

	Erosion and Sediment Control Plan	yes	n/a	no	sheet
1	Include the Following on Erosion and Sediment Control Plan Sheets				
a	E&S Control Plan and Site Plans	X			C031.1
b	E&S Control Narrative	X			C032.1
c	E&S Control practices detail drawing (dewatering device, etc..)	X			C032.3
d	E&S Control Plan Legend	X			C031.1
e	Virginia Erosion and Sediment Control Handbook (VESCH) specification numbers	X			C031.1
f	Blank Responsible Land Disturber Letter	X			C035.3
2	General E&S Control Notes, General Land Conservation Notes, and Pre-Storm Erosion and Sediment Control Checklist.	X			C032.1
3	Landscape Conservation Plan with the following clearly indicated				
a	Determination of the critical root zone	X			C031.1
b	Tree protection fencing	X			C031.1
c	Signage			X	
d	Critical Root zone mitigation, such as root pruning, padding, or other root protection methods	X			C031.1
e	Note requiring county arborist inspection before any land disturbance activity	X			C032.2
f	Tree inventory of all trees larger than 3 inches DBH, either on site or with a critical root zone encroaching the limit of disturbance. This list will contain information on species, size, health, whether the tree is to be protected or not, and other issues, such as location in the RPA, disease concerns, or invasive species presence	X			C032.2
g	Tree canopy coverage calculation			X	
h	RPA delineation, if applicable		X		
i	For 4.1 site plans and use permits, a copy of all relevant approved conditions, including, but not limited to, the landscape plan and tree preservation plan		X		
j	For 4.1 site plans and use permits, a copy of the tree preservation plan and the calculation of the tree replacement value of removed trees approved by the County Board, if these were part of the approval		X		
k	For public projects which do not have a tree preservation condition approved by the County Board, a calculation of the tree replacement value of removed trees	X			C092.1

	Stormwater Management Plan	YES	NO	N/A	sheet
1	Include the following on Stormwater Management Plan Sheets				
a	Runoff Reduction Spreadsheet	X			C035.4
b	Design details and reference of stormwater facilities listed in the Runoff Reduction Spreadsheet			X	
c	Facility detail, maintenance schedule, material specifications and construction inspection checklist for each stormwater facility proposed			X	
d	Drainage area boundary and runoff flow arrows	X			C071.1- C071.2
e	Water Quantity Energy Balance Worksheet			X	
f	Waterproofing Note, if applicable			X	
g	Meet requirement for sheetflow and statement of no adverse impact to adjacent properties			X	

h	Indicate sump pump discharge location, tie into the public storm sewer system when possible.			X	
i	Indicate Floodplain boundary and floodplain study OR certification on plan that no floodplain is present			X	
j	Indicate Resource Protection Area (RPA) boundary on plan OR include certified note on plan that no RPA is present. If RPA is present, include Completed Water Quality Impact Assessment (WQIA) form with required elements. Include Completed Exception Request Form on plan (if required), and proposed RPA mitigation			X	
k	Blank Stormwater Facility Maintenance and Monitoring Agreement			X	
l	SWM# on the coversheet, once assigned after 1st review	X			C000.1
m	For 4.1 site plans and use permits, a copy of the conceptual SWM plan and calculations from the County Board-approved 4.1 or use permit plans for information only			X	

	Pollution Prevention Plan				
1	Include the following on the Pollution Prevention Plan				
a	Standard notes from Stormwater Manual Section 2.4	X			C032.1
b	Authorized Non-Stormwater Discharge (Section 2.0), Potential Sources of Pollution & Pollution Prevention Practices (Section 5.0), and Spill Prevention & Response (Section 7.0) from SWPPP Template (Appendix B) of the Stormwater Manual	X			C035.1- C035.2

	Wet Utility Requirements				
a	for a new development with a new building or for additions that will upgrade to more than 3 toilets (WCs), the water meter and service line shall have as existing, or be upgraded to a minimum ¾" and 1", respectively.		X		
b	the location of the existing and proposed meter/service shall clearly be shown on the plan to be within the utility strip (where applicable) or sidewalk but not on private property without the provision of an easement: ,nor in driveway/apron, nor within five (5) tormwater Management Facility and Site Data Spreadsheet	X			C041.1- C041.6
c	if the water service and meter are relocated from the existing meter location and the service line crosses other utilities (water, sewer, gas, underground dry utility) between the water main and meter , a depth profile shall be provided to clearly show the separation from these utilities with a minimum vertical separation of twelve (12) inches. The plan must be certified by a licensed professional			X	
d	the location of the new meter shall be staked out by the developer/owner with information to be provided to the County meter installers.from these utilities with a minimum vertical separation of twelve (12) inches. The plan must be certified by a licensed professional			X	

	Attachments (one 8.5"x 11" hard copy stapled to the SWPPP plan)				
a	Registration Statement for project with land disturbance equal to or greater than 1 acre		X		
b	Stormwater Management Facility and Site Data Spreadsheet		X		
c	Stormwater Prevention Plan (P2) Template of the Stormwater Manual	X			
d	Planning & Field Guide for Pollution Prevention (P2)	X			

I certify that the above is true and accurate to the best of my knowledge.

Signature

January 30, 2020

Date

ARLINGTON VIRGINIA

DEPARTMENT OF ENVIRONMENTAL SERVICES

FACILITIES & ENGINEERING DIVISION
ENGINEERING BUREAU
2100 CLARENDON BOULEVARD, SUITE 813
ARLINGTON, VA 22201
PHONE: 703.228.3629
FAX: 703.228.3606

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SEAL
COMMONWEALTH OF VIRGINIA
JIONG LIN
Lic. No. 0402051875
04/07/2020
PROFESSIONAL ENGINEER

APPROVALS	DATE
	4/7/2020
QUALITY CONTROL ENGINEER Kamal N. Taktak	4.7.20
CONSTRUCTION MANAGEMENT SUPERVISOR David W. Hundelt	04.14.2020
WATER, SEWER, STREETS BUREAU CHIEF Dennis M. Leach.	04/13/20
TRANSPORTATION DIRECTOR Tim McAntosh	4/16/20
PROJECT MANAGER	

REVISIONS	DATE

PROJECT NAME AND LOCATION
STORMWATER POLLUTION PREVENTION PLAN III

N HIGHLAND STREET
1ST ROAD N
TO ARLINGTON BOULEVARD

Z261

DESIGNED: E CACCAVARI
DRAWN: E CACCAVARI
CHECKED: J LIN
MISS UTILITY TRANSMITTAL #5330

FILENAME: Z261-220-E_AND_S_NOTES_SWPPP.DWG
PATH: Q:\DATA\Z261\DESIGN\CAD\ACTIVE
PLOTTED: JUNE 23 2020
PLOTTED BY: ECACCAVARI

SCALE N/A

SHEET C035.3

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DEQ Virginia Runoff Reduction Method Re-Development Compliance Spreadsheet - Version 3.0

○ 2011 BMP Standards and Specifications ◉ 2013 Draft BMP Standards and Specifications

Project Name:	Z261 - N Highland St. Street Improvements
Date:	10/11/2019
Linear Development Project?	Yes

CLEAR ALL

data input cells
constant values
calculation cells
final results

Site Information

Post-Development Project (Treatment Volume and Loads)

Enter Total Disturbed Area *(acres)* → 0.8046

Maximum reduction required:	*20%*
The site's net increase in impervious cover (acres) is:	*0.0236*
Post-Development TP Load Reduction for Site (lb/yr):	*0.3121*

Check:
BMP Design Specifications List: 2013 Draft Stds & Specs
Linear project? Yes
Land cover areas entered correctly? ✓
Total disturbed area entered? ✓ *Total disturbed area > Post-Development area!*

Pre-ReDevelopment Land Cover (acres)

	A Soils	B Soils	C Soils	D Soils	Totals
Forest/Open Space (acres) -- undisturbed forest/open space					0.0000
Managed Turf (acres) -- disturbed, graded for yards or other turf to be mowed/managed		0.2219			0.2219
Impervious Cover (acres)		0.5803			0.5803
					0.8022

Post-Development Land Cover (acres)

	A Soils	B Soils	C Soils	D Soils	Totals
Forest/Open Space (acres) -- undisturbed, protected forest/open space or reforested land					0.0000
Managed Turf (acres) -- disturbed, graded for yards or other turf to be mowed/managed		0.1983			0.1983
Impervious Cover (acres)		0.6039			0.6039
Area Check	OK.	OK.	OK.	OK.	0.8022

Constants

Annual Rainfall (inches)	43
Target Rainfall Event (inches)	1.00
Total Phosphorus (TP) EMC (mg/L)	0.26
Total Nitrogen (TN) EMC (mg/L)	1.86
Target TP Load (lb/acre/yr)	0.41
Pj (unitless correction factor)	0.90

Runoff Coefficients (Rv)

	A Soils	B Soils	C Soils	D Soils
Forest/Open Space	0.02	0.03	0.04	0.05
Managed Turf	0.15	0.20	0.22	0.25
Impervious Cover	0.95	0.95	0.95	0.95

LAND COVER SUMMARY -- PRE-REDEVELOPMENT

Land Cover Summary-Pre

Pre-ReDevelopment	Listed	Adjusted[1]
Forest/Open Space Cover (acres)	0.0000	0.0000
Weighted Rv(forest)	0.0000	0.0000
% Forest	0%	0%
Managed Turf Cover (acres)	0.2219	0.1983
Weighted Rv(turf)	0.2000	0.2000
% Managed Turf	28%	25%
Impervious Cover (acres)	0.5803	0.5803
Rv(impervious)	0.9500	0.9500
% Impervious	72%	75%
Total Site Area (acres)	**0.8022**	**0.7786**
Site Rv	**0.7425**	**0.7590**

LAND COVER SUMMARY -- POST DEVELOPMENT

Land Cover Summary-Post (Final)

Post ReDev. & New Impervious	
Forest/Open Space Cover (acres)	0.0000
Weighted Rv(forest)	0.0000
% Forest	0%
Managed Turf Cover (acres)	0.1983
Weighted Rv (turf)	0.2000
% Managed Turf	25%
Impervious Cover (acres)	0.6039
Rv(impervious)	0.9500
% Impervious	75%
Final Site Area (acres)	**0.8022**
Final Post Dev Site Rv	**0.7646**

Land Cover Summary-Post

Post-ReDevelopment	
Forest/Open Space Cover (acres)	0.0000
Weighted Rv(forest)	0.0000
% Forest	0%
Managed Turf Cover (acres)	0.1983
Weighted Rv (turf)	0.2000
% Managed Turf	25%
ReDev. Impervious Cover (acres)	0.5803
Rv(impervious)	0.9500
% Impervous	75%
Total ReDev. Site Area (acres)	**0.7786**
ReDev Site Rv	**0.7590**

Land Cover Summary-Post

Post-Development New Impervious	
New Impervious Cover (acres)	0.0236
Rv(impervious)	0.9500

Treatment Volume and Nutrient Load

Pre-ReDevelopment Treatment Volume (acre-ft)	0.0496
Pre-ReDevelopment Treatment Volume (cubic feet)	2,162.2640
Pre-ReDevelopment TP Load (lb/yr)	**1.3585**
Pre-ReDevelopment TP Load per acre (lb/acre/yr)	1.6900
Baseline TP Load (lb/yr) (**0.41 lbs/acre/yr** applied to pre-redevelopment area excluding pervious land proposed for new impervious cover)	*0.3192*

Final Post-Development Treatment Volume (acre-ft)	0.0511
Final Post-Development Treatment Volume (cubic feet)	2,226.5150
Final Post-Development TP Load (lb/yr)	**1.3989**
Final Post-Development TP Load per acre (lb/acre/yr)	1.7400

Post-ReDevelopment Treatment Volume (acre-ft)	0.0492
Post-ReDevelopment Treatment Volume (cubic feet)	2,145.1304
Post-ReDevelopment Load (TP) (lb/yr)*	**1.3478**
Post-ReDevelopment TP Load per acre (lb/acre/yr)	1.7300
Max. Reduction Required (Below Pre-ReDevelopment Load)	**20%**
TP Load Reducion Requirec for Redeveloped Area (lb/yr)	**0.2696**

Post-Development Treatment Volume (acre-ft)	0.0019
Post-Development Treatment Volume (cubic feet)	81.3846
Post-Development TP Load (lb/yr)	**0.0511**
TP Load Reduction Required for New Impervious Area (lb/yr)	**0.0415**

[1] *Adjusted Land Cover Summary:*
Pre ReDevelopment land cover minus pervious land cover (forest/open space or managed turf) acreage proposed for new impervious cover.

Adjusted total acreage is consistent with Post-ReDevelopment acreage (minus acreage of new impervious cover).

Column I shows load reduction requirement for new impervious cover (based on new development load limit, 0.41 lbs/acre/year).

Post-Development Requirement for Site Area

TP Load Reduction Required (lb/yr)	**0.3110**
Linear Project TP Load Reduction Required (lb/yr):	0.3121

Nitrogen Loads (Informational Purposes Only)

Pre-ReDevelopment TN Load (lb/yr)	9.7188
Final Post-Development TN Load (Post-ReDevelopment & New Impervious) (lb/yr)	10.0076

COMPUTATION BASED ON TOTAL ARLINGTON COUNTY LAND DISTURBANCE OF THE PROJECT

DEQ Virginia Runoff Reduction Method Re-Development Compliance Spreadsheet - Version 3.0

○ 2011 BMP Standards and Specifications ◉ 2013 Draft BMP Standards and Specifications

Project Name:	Z261-N Highland St Improvements
Date:	
Linear Development Project?	Yes

CLEAR ALL

data input cells
constant values
calculation cells
final results

Site Information

Post-Development Project (Treatment Volume and Loads)

Enter Total Disturbed Area *(acres)* → 0.00

Maximum reduction required:	*20%*
The site's net increase in impervious cover (acres) is:	*0.0009*
Post-Development TP Load Reduction for Site (lb/yr):	*0.00*

Check:
BMP Design Specifications List: 2013 Draft Stds & Specs
Linear project? Yes
Land cover areas entered correctly? ✓
Total disturbed area entered? ✓

Pre-ReDevelopment Land Cover (acres)

	A Soils	B Soils	C Soils	D Soils	Totals
Forest/Open Space (acres) -- undisturbed forest/open space					0.00
Managed Turf (acres) -- disturbed, graded for yards or other turf to be mowed/managed		0.00			0.00
Impervious Cover (acres)		0.00			0.00
					0.00

Post-Development Land Cover (acres)

	A Soils	B Soils	C Soils	D Soils	Totals
Forest/Open Space (acres) -- undisturbed, protected forest/open space or reforested land					0.00
Managed Turf (acres) -- disturbed, graded for yards or other turf to be mowed/managed		0.00			0.00
Impervious Cover (acres)		0.00			0.00
Area Check	OK.	OK.	OK.	OK.	0.00

Constants

Annual Rainfall (inches)	43
Target Rainfall Event (inches)	1.00
Total Phosphorus (TP) EMC (mg/L)	0.26
Total Nitrogen (TN) EMC (mg/L)	1.86
Target TP Load (lb/acre/yr)	0.41
Pj (unitless correction factor)	0.90

Runoff Coefficients (Rv)

	A Soils	B Soils	C Soils	D Soils
Forest/Open Space	0.02	0.03	0.04	0.05
Managed Turf	0.15	0.20	0.22	0.25
Impervious Cover	0.95	0.95	0.95	0.95

LAND COVER SUMMARY -- PRE-REDEVELOPMENT

Land Cover Summary-Pre

Pre-ReDevelopment	Listed	Adjusted[1]
Forest/Open Space Cover (acres)	0.00	0.00
Weighted Rv(forest)	0.00	0.00
% Forest	0%	0%
Managed Turf Cover (acres)	0.00	0.00
Weighted Rv(turf)	0.20	0.20
% Managed Turf	100%	100%
Impervious Cover (acres)	0.00	0.00
Rv(impervious)	0.95	0.95
% Impervious	0%	0%
Total Site Area (acres)	**0.00**	**0.00**
Site Rv	**0.20**	**0.20**

LAND COVER SUMMARY -- POST DEVELOPMENT

Land Cover Summary-Post (Final)

Post ReDev. & New Impervious	
Forest/Open Space Cover (acres)	0.00
Weighted Rv(forest)	0.00
% Forest	0%
Managed Turf Cover (acres)	0.00
Weighted Rv (turf)	0.20
% Managed Turf	67%
Impervious Cover (acres)	0.00
Rv(impervious)	0.95
% Impervious	33%
Final Site Area (acres)	**0.00**
Final Post Dev Site Rv	**0.45**

Land Cover Summary-Post

Post-ReDevelopment	
Forest/Open Space Cover (acres)	0.00
Weighted Rv(forest)	0.00
% Forest	0%
Managed Turf Cover (acres)	0.00
Weighted Rv (turf)	0.20
% Managed Turf	100%
ReDev. Impervious Cover (acres)	0.00
Rv(impervious)	0.95
% Impervious	0%
Total ReDev. Site Area (acres)	**0.00**
ReDev Site Rv	**0.20**

Land Cover Summary-Post

Post-Development New Impervious	
New Impervious Cover (acres)	0.00
Rv(impervious)	0.95

Treatment Volume and Nutrient Load

Pre-ReDevelopment Treatment Volume (acre-ft)	0.0000
Pre-ReDevelopment Treatment Volume (cubic feet)	2
Pre-ReDevelopment TP Load (lb/yr)	**0.00** *
Pre-ReDevelopment TP Load per acre (lb/acre/yr)	0.46 *
Baseline TP Load (lb/yr) (**0.41 lbs/acre/yr** applied to pre-redevelopment area excluding pervious land proposed for new impervious cover)	*0.00*

Final Post-Development Treatment Volume (acre-ft)	0.0001
Final Post-Development Treatment Volume (cubic feet)	4
Final Post-Development TP Load (lb/yr)	**0.00**
Final Post-Development TP Load per acre (lb/acre/yr)	1.03

Post-ReDevelopment Treatment Volume (acre-ft)	0.0000
Post-ReDevelopment Treatment Volume (cubic feet)	1
* **Post-ReDevelopment Load (TP) (lb/yr)***	**0.00**
Post-ReDevelopment TP Load per acre (lb/acre/yr)	0.46
Max. Reduction Required (Below Pre-ReDevelopment Load)	**20%**
* **TP Load Reduction Required for Redeveloped Area (lb/yr)**	**0.00**

Post-Development Treatment Volume (acre-ft)	0.0001
Post-Development Treatment Volume (cubic feet)	3
Post-Development TP Load (lb/yr)	**0.00**
TP Load Reduction Required for New Impervious Area (lb/yr)	**0.00**

[1] *Adjusted Land Cover Summary:*
Pre ReDevelopment land cover minus pervious land cover (forest/open space or managed turf) acreage proposed for new impervious cover.

Adjusted total acreage is consistent with Post-ReDevelopment acreage (minus acreage of new impervious cover).

Column I shows load reduction requirement for new impervious cover (based on new development load limit, 0.41 lbs/acre/year).

* *Reduction below new development load limitation not required*

Post-Development Requirement for Site Area

TP Load Reduction Required (lb/yr)	**0.00**	**	*TP LOAD REDUCTION NOT REQUIRED*
Linear Project TP Load Reduction Required (lb/yr):	0.00	**	*TP LOAD REDUCTION NOT REQUIRED*

Nitrogen Loads (Informational Purposes Only)

Pre-ReDevelopment TN Load (lb/yr)	0.01
Final Post-Development TN Load (Post-ReDevelopment & New Impervious) (lb/yr)	0.02

COMPUTATION BASED ON LAND DISTURBANCE WITHIN VDOT MS4 SERVICE AREA ONLY

ARLINGTON
VIRGINIA

DEPARTMENT OF ENVIRONMENTAL SERVICES
FACILITIES & ENGINEERING DIVISION
ENGINEERING BUREAU
2100 CLARENDON BOULEVARD, SUITE 813
ARLINGTON, VA 22201
PHONE: 703.228.3629
FAX: 703.228.3606

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SEAL
COMMONWEALTH OF VIRGINIA
JIONG LIN
Lic. No. 0402051875
04/07/2020
PROFESSIONAL ENGINEER

APPROVALS	DATE
	4/7/2020
QUALITY CONTROL ENGINEER Kamal N. Taktak	4.7.20
CONSTRUCTION MANAGEMENT SUPERVISOR David W. Hundelt	04.14.2020
WATER, SEWER, STREETS BUREAU CHIEF Dennis M. Leach.	04/13/20
TRANSPORTATION DIRECTOR Tim McAntosh	4/16/20
PROJECT MANAGER	

REVISIONS	DATE

PROJECT NAME AND LOCATION
STORMWATER POLLUTION PREVENTION PLAN IV
N HIGHLAND STREET
1ST ROAD N
TO ARLINGTON BOULEVARD
Z261

DESIGNED: E CACCAVARI
DRAWN: E CACCAVARI
CHECKED: J LIN
MISS UTILITY TRANSMITTAL #5330

FILENAME: Z261-220-E_AND_S_NOTES_SWPPP.DWG
PATH: Q:\DATA\Z261\DESIGN\CAD\ACTIVE
PLOTTED: JUNE 23 2020
PLOTTED BY: ECACCAVARI

SCALE N/A

SHEET C035.4

Revised: 01/21/2016

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Pre-Storm Erosion and Sediment Control Checklist

Per Erosion and Sediment Control General Note 6, the Contractor is responsible for the installation and maintenance of any additional erosion and sediment control (ESC) measures necessary to prevent erosion and sedimentation as determined by the County. These supplementary practices are in addition to those shown in an ESC plan. ESC practices shall be modified as needed to ensure only clear water is discharged from the site.

The following actions shall be taken prior to storm events with predicted heavy and/or large volume rainfall to prevent sediment discharges from a construction site. A typical summer thunderstorm is an example of a storm event with predicted heavy and/or large volume rainfall.

Perimeter controls

- ☐ Silt fence shall be checked for undermining, holes, or deterioration of the fabric. Fencing shall be replaced immediately if the fabric is damaged or worn. Silt fence must be trenched into the ground per state specifications (Std & Spec 3.09).
- ☐ Wooden stakes or steel posts shall be properly secured upright into the ground. Damaged posts or stakes must be replaced.
- ☐ Sediment that has accumulated against the silt fence should be removed. Accumulated sediment must be removed when the level reaches one-half the height of the fencing.
- ☐ Hay bales or a stone berm should be placed across the construction entrance to prevent sediment from leaving the construction site.

Exposed slopes and soil

- ☐ Exposed slopes not at the final stabilization phase shall be covered with tarps, plastic sheeting, or erosion control matting. Covering material shall be properly secured/anchored.
- ☐ Controls shall be installed to prevent concentrated flow down an exposed slope. Berms or diversion dikes shall be installed at the top of cut / exposed slopes to direct storm flow around the disturbed area.
- ☐ Exposed slopes at the final stabilization phase shall be stabilized using slope stabilization practices such as soil stabilization blankets or matting as specified in the Virginia Erosion and Sediment Control Handbook (VESCH) Std & Spec 3.36. Blankets or mats must be properly secured and anchored to the slope using staples, pins, or stakes.
- ☐ Seeded areas shall be checked and reseeded as necessary to cover exposed soil. Recently seeded areas shall be protected by straw or soil stabilization blankets to prevent seeding from being washed away.

Stockpiles

- ☐ Stockpiled soil and other loose materials that can be washed away shall be covered with a tarp, plastic sheeting, or other stabilization matting. The cover must be properly secured / anchored down to prevent it from being blown off and exposing materials to rain. Controls such as hay bales or booms should be placed along the perimeter of the stock pile (downhill side).

Inlet protection

- ☐ Inlet protection controls shall be inspected to ensure they are functioning properly and flooding will not occur. Clogged or damaged controls must be replaced immediately. Ensure controls allow for overflow / bypass of stormwater runoff during significant storm events.

In addition to these pre-storm actions, all erosion and sediment control (ESC) measures must be checked daily and after each significant rainfall.

NOTES

THE RUNOFF REDUCTION SPREADSHEET INFORMATION ON THIS PLAN IS FOR DATA TRACKING PURPOSES TO DOCUMENT THE AREA OF LAND DISTURBANCE AND TO CHARACTERIZE PRE- AND POST-DEVELOPMENT LAND USE CONDITIONS.

IN ACCORDANCE WITH ARLINGTON COUNTY'S CHESAPEAKE BAY TOTAL MAXIMUM DAILY LOAD (TMDL) ACTION PLAN, APPROVED BY THE VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY (DEQ) ON SEPTEMBER 1, 2015, LINEAR DEVELOPMENT PROJECTS CONDUCTED BY THE COUNTY ARE ADMINISTERED AND TRACKED AS FOLLOWS CONSISTENT WITH 9VAC25-870-69.A.4, 9VAC25-870-76, AND 9VAC25-870-92:

- POLLUTANT LOAD CHANGES WILL BE COMPUTED AS DESCRIBED IN SECTION 3.A OF THE ACTION PLAN.
- RETROFIT OPPORTUNITIES WILL BE EVALUATED FOR EACH PROJECT, USING THE SCREENING AND SELECTION CRITERIA APPLIED AND DESCRIBED IN THE ADOPTED STORMWATER MASTER PLAN.
- RETROFIT PROJECTS THAT MEET THE SCREENING CRITERIA AND ARE DETERMINED BY ARLINGTON TO BE FEASIBLE AND COST-EFFECTIVE WILL BE IMPLEMENTED WITH SPECIFIC LINEAR DEVELOPMENT PROJECTS. POLLUTANT LOAD REDUCTIONS FROM RETROFIT PROJECTS WILL BE COMPUTED AS DESCRIBED IN SECTION 5 OF THE ACTION PLAN.
- IN CASES WHERE RETROFIT PROJECTS ARE NOT FEASIBLE AND COST-EFFECTIVE FOR A PARTICULAR LINEAR PROJECT, ANY POLLUTANT OF CONCERN (POC) LOAD INCREASES THAT MIGHT OCCUR FOR THAT PROJECT WILL BE ADDRESSED BY LARGER OVERALL POC LOAD REDUCTIONS IN PLACE OR ADDED THROUGH TMDL ACTION PLAN IMPLEMENTATION.

IN THE ABOVE MANNER ARLINGTON, AS THE MS4 OPERATOR AND THE CONSTRUCTION SITE OPERATOR FOR ITS LINEAR DEVELOPMENT PROJECTS, IMPLEMENTS LINEAR PROJECTS AND RETROFIT PROJECTS IN A MANNER THAT ACHIEVES THE MOST TMDL POC REDUCTION FOR THE LEAST COST, WHILE FULLY ACCOUNTING FOR LOAD CHANGES THAT OCCUR WITH LINEAR DEVELOPMENT PROJECT ACTIVITY CONSISTENT WITH THE DEQ CHESAPEAKE BAY TMDL SPECIAL CONDITION GUIDANCE.

THIS COUNTY LINEAR DEVELOPMENT PROJECT IS ADMINISTERED AND TRACKED IN ACCORDANCE WITH ARLINGTON COUNTY'S CHESAPEAKE BAY TMDL ACTION PLAN, AND THEREFORE THE PROJECT DOES NOT NEED TO INDIVIDUALLY APPLY FOR, OR PROVIDE, WATER QUALITY NUTRIENT CREDITS AND PERMANENT STORMWATER MANAGEMENT BMPS FOR THE PROJECT.

ARLINGTON
VIRGINIA

DEPARTMENT OF ENVIRONMENTAL SERVICES
FACILITIES & ENGINEERING DIVISION
ENGINEERING BUREAU
2100 CLARENDON BOULEVARD, SUITE 813
ARLINGTON, VA 22201
PHONE: 703.228.3629
FAX: 703.228.3606

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SEAL

COMMONWEALTH OF VIRGINIA
JIONG LIN
Lic. No. 0402051875
04/07/2020
PROFESSIONAL ENGINEER

APPROVALS	DATE
	4/7/2020
QUALITY CONTROL ENGINEER Kamal N. Taktak	4.7.20
CONSTRUCTION MANAGEMENT SUPERVISOR David W. Hundelt	04.14.2020
WATER, SEWER, STREETS BUREAU CHIEF Dennis M. Leach.	04/13/20
TRANSPORTATION DIRECTOR Tim McAntosh	4/16/20
PROJECT MANAGER	

REVISIONS	DATE

PROJECT NAME AND LOCATION
STORMWATER POLLUTION PREVENTION PLAN V
N HIGHLAND STREET
1ST ROAD N
TO ARLINGTON BOULEVARD
Z261

DESIGNED: E CACCAVARI
DRAWN: E CACCAVARI
CHECKED: J LIN
MISS UTILITY TRANSMITTAL #5330

FILENAME: Z261-220-E_AND_S_NOTES_SWPPP.DWG
PATH: Q:\DATA\Z261\DESIGN\CAD\ACTIVE
PLOTTED: JUNE 23 2020
PLOTTED BY: ECACCAVARI

SCALE N/A

SHEET C035.5

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N HIGHLAND ST - CENTERLINE PROFILE
PROP N HIGHLAND ST (ALIGNMENT)

Revised: 01/21/2016

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DEPARTMENT OF ENVIRONMENTAL SERVICES
FACILITIES & ENGINEERING DIVISION
ENGINEERING BUREAU
2100 CLARENDON BOULEVARD, SUITE 813
ARLINGTON, VA 22201
PHONE: 703.228.3629
FAX: 703.228.3606

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SEAL
COMMONWEALTH OF VIRGINIA
JIONG LIN
Lic. No. 0402061875
07/27/2020
PROFESSIONAL ENGINEER

APPROVALS	DATE
QUALITY CONTROL ENGINEER	7/28/2020
CONSTRUCTION MANAGEMENT SUPERVISOR (Kamal Taktak)	7.27.20
WATER, SEWER, STREETS BUREAU CHIEF	07.27.2020
TRANSPORTATION DIRECTOR (Dennis M. Leach)	7/27/20
PROJECT MANAGER (Tim McIntosh)	7-27-20

REVISIONS	DATE

PROJECT NAME AND LOCATION
PLAN AND PROFILE I
N HIGHLAND STREET
1ST ROAD N
TO ARLINGTON BOULEVARD
Z261

DESIGNED: E CACCAVARI
DRAWN: E CACCAVARI
CHECKED: J LIN
MISS UTILITY TRANSMITTAL #5330

FILENAME: Z261-230-PLAN_PROFILE.DWG
PATH: Q:\DATA\Z261\DESIGN\CAD\ACTIVE
PLOTTED: JULY 30 2020
PLOTTED BY: ECACCAVARI

SCALE
HORIZ: 1" = 25'
VERT: 1" = 5'

SHEET C041.1

N HIGHLAND ST - CENTERLINE PROFILE
PROP N HIGHLAND ST (ALIGNMENT)

ARLINGTON VIRGINIA

DEPARTMENT OF ENVIRONMENTAL SERVICES
FACILITIES & ENGINEERING DIVISION
ENGINEERING BUREAU
2100 CLARENDON BOULEVARD, SUITE 813
ARLINGTON, VA 22201
PHONE: 703.228.3629
FAX: 703.228.3606

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SEAL
COMMONWEALTH OF VIRGINIA
JIONG LIN
Lic. No. 0402051875
04/07/2020
PROFESSIONAL ENGINEER

APPROVALS	DATE
	4/7/2020
QUALITY CONTROL ENGINEER Kamal N. Taktak	4.7.20
CONSTRUCTION MANAGEMENT SUPERVISOR David W. Hundelt	04.14.2020
WATER, SEWER, STREETS BUREAU CHIEF Dennis M. Leach.	04/13/20
TRANSPORTATION DIRECTOR Tim McIntosh	4/16/20
PROJECT MANAGER	

REVISIONS	DATE

PROJECT NAME AND LOCATION
PLAN AND PROFILE II

N HIGHLAND STREET
1ST ROAD N
TO ARLINGTON BOULEVARD
Z261

DESIGNED: E CACCAVARI
DRAWN: E CACCAVARI
CHECKED: J LIN
MISS UTILITY TRANSMITTAL #5330

FILENAME: Z261-230-PLAN_PROFILE.DWG
PATH: Q:\DATA\Z261\DESIGN\CAD\ACTIVE
PLOTTED: JUNE 23 2020
PLOTTED BY: ECACCAVARI

SCALE
HORIZ: 1" = 25'
VERT: 1" = 5'

SHEET C041.2

Revised: 01/21/2016

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CONSTRUCTION NOTES

1. PROP CURB AND GUTTER (C-2) ARL STD (R-2.0)
1B. PROP REVERSE PITCH CURB & GUTTER (C2-R) ARL STD (CR-2.0)
1C. TRANSITION 10' BETWEEN PROP CURB AND REVERSE PITCH CURB
1D. 1' NOSE DOWN CURB, MATCH EXISTING GROUND
2. PROP SIDEWALK ARL STD (R-2.0)
2B. PROP RAMP (CG-12B) VDOT ROAD & BRIDGE STANDARDS (204.03) SEE SHEET C042.1 FOR CURB RAMP DETAILS
2C. REMOVE EXISTING SIDEWALK AND REPLACE WITH SOD BETWEEN DRIVEWAYS AT PROPERTIES #29 AND #31.
3. PROP RESIDENTIAL CONCRETE DRIVEWAY ENTRANCE (STANDARD) ARL STD (R-2.4A), SEE SHEET C002.1 - C002.2 FOR DRIVEWAY DETAILS
3A. PROP RESIDENTIAL CONCRETE DRIVEWAY ENTRANCE 2" DEPRESSION ARL STD (R-2.4B), SEE SHEET C002.1 - C002.2 FOR DRIVEWAY DETAILS
4. ADJUST EXISTING WATER METER TO PROPOSED GRADE
4A. ADJUST EXISTING WATER MANHOLE COVER TO PROPOSED GRADE
4C. ADJUST EXISTING WATER VALVE TO PROPOSED GRADE
4D. ADJUST EXISTING WATER METER TO PROPOSED GRADE. 9" CONCRETE SHALL BE PROVIDED AROUND BUMP-OUT WATER METERS. SEE SHEET C051.1 FOR DETAILS.
5. RELOCATE EXISTING WATER METER (ARLINGTON COUNTY STANDARD W-9.0)
5A. PROPOSED WATER MAIN AND SERVICE LINES (BY OTHERS) PRIOR TO STREET IMPROVEMENT CONSTRUCTION BETWEEN STA 0+50 AND STA 8+53, SEE PROJECT R085 FOR ADDITIONAL INFORMATION.
5B. RELOCATE EXISTING FIRE HYDRANT (BY OTHERS) PRIOR TO STREET IMPROVEMENT CONSTRUCTION SEE PROJECT R085 FOR ADDITIONAL INFORMATION.
6. REMOVE AND RESET EXISTING FENCE IN NEW LOCATION
6A. EXISTING FENCE TO REMAIN IN-PLACE DURING CONSTRUCTION UNLESS PROGRESS DICTATES OTHERWISE WHEREAS THE FENCE WILL THEN BE REMOVED AND RESET IN SAME LOCATION
6B. REMOVE AND RESET EXISTING FENCE IN SAME LOCATION
7. MATCH EXISTING SIDEWALK AND/OR CURB & GUTTER
7A. TRANSITION EXISTING LEAD WALK TO MEET PROPOSED SURFACE AND REPLACE WITH LIKE MATERIALS
7B. MATCH EXISTING ROADWAY SURFACE
7C. NEW CONCRETE STEPS ARLINGTON COUNTY STANDARD (R-3.0)
8. EXTEND EXISTING GUTTER DRAIN PIPE TO PROPOSED CURB. IF PROPOSED PIPE CANNOT MEET EXISTING PIPE'S GRADE, CONTRACTOR SHALL PROVIDE PROPOSED PIPE FROM PROPOSED FACE-OF-CURB TO RIGHT-OF-WAY LINE. ALL GUTTER DRAIN PIPE WORK SHALL BE UNDER THE GUIDANCE OF THE PROJECT OFFICER AND COORDINATE WITH THE PROPERTY OWNER.
9. ADJUST EXISTING SANITARY MANHOLE TO PROPOSED GRADE
9A. EXISTING MANHOLES FOR VERIZON VAULTS SHALL ONLY BE VERTICALLY ADJUSTED TO PROPOSED GRADE BY VERIZON CREWS
10. RELOCATE EXISTING UTILITY POLE AND ALL GUY WIRE(S), ARLINGTON COUNTY STANDARD (R-5.0) (BY OTHERS)
11. ADJUST EXISTING GAS VALVE TO PROPOSED GRADE
11A. REMOVE EXISTING GAS VALVE
11B. PROPOSED 2" GAS MAIN TO BE INSTALLED BY OTHERS PRIOR TO CONSTRUCTION
11C. EXISTING 2" GAS MAIN TO BE ABANDONED BY OTHERS PRIOR TO CONSTRUCTION
12. REMOVE AND RECONSTRUCT PAVING LAYOUT AS SHOWN ON PLAN WITH LIKE MATERIALS

ADDITIONAL NOTES

1. PLAN VIEW PROVIDED AT 10-SCALE FOR CLARITY.
2. TEST HOLE DATA IS AVAILABLE UPON CONTRACTOR REQUEST.
3. PROPOSED MILLING & SURFACE PAVING WILL BE PERFORMED BY OTHERS.
4. CONTRACTOR SHALL INSTALL 5" BASE COURSE AS PART OF FULL DEPTH ASPHALT. 2" SURFACE COURSE WILL BE PERFORMED BY OTHERS.
5. CONTRACTOR SHALL INSTALL DRIVEWAY CONNECTION BETWEEN CONCRETE APRON AND EXISTING DRIVEWAY WITH LIKE MATERIALS. CONTRACTOR SHALL PROVIDE 6" MINIMUM AGGREGATE BASE AND 4" SURFACE COURSE PAVING FOR PROPOSED ASPHALT DRIVEWAY CONNECTIONS.
6. NEW FRAME AND COVERS WITH SPECIAL SPIKED FRAME SHALL BE INSTALLED TO ALL WATER METERS CAST IN CONCRETE SEE SHEET C051.1 FOR DETAILS.
7. ALL PAVEMENT WIDENING SHALL BE PERFORMED IN ACCORDANCE WITH VDOT STANDARD WP-2 (303.02).

LEGEND

- 6"W - ABANDONED EXISTING WATER MAIN
- CR-# - CURB RAMP NUMBER
- D# - DRIVEWAY NUMBER

Revised: 01/21/2016

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ARLINGTON VIRGINIA
DEPARTMENT OF ENVIRONMENTAL SERVICES
FACILITIES & ENGINEERING DIVISION
ENGINEERING BUREAU
2100 CLARENDON BOULEVARD, SUITE 813
ARLINGTON, VA 22201
PHONE: 703.228.3629
FAX: 703.228.3606

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SEAL
COMMONWEALTH OF VIRGINIA
JIONG LIN
Lic. No. 0402051875
04/07/2020
PROFESSIONAL ENGINEER

APPROVALS	DATE
	4/7/2020
QUALITY CONTROL ENGINEER Kamal N. Taktak	4.7.20
CONSTRUCTION MANAGEMENT SUPERVISOR David W. Hundelt	04.14.2020
WATER, SEWER, STREETS BUREAU CHIEF Dennis M. Leach.	04/13/20
TRANSPORTATION DIRECTOR Tim McIntosh	4/16/20
PROJECT MANAGER	

REVISIONS	DATE

PROJECT NAME AND LOCATION
PLAN DETAILS I
N HIGHLAND STREET
1ST ROAD N
TO ARLINGTON BOULEVARD
Z261

DESIGNED: E CACCAVARI
DRAWN: E CACCAVARI
CHECKED: J LIN
MISS UTILITY TRANSMITTAL #5330

FILENAME: Z261-230-PLAN_PROFILE.DWG
PATH: Q:\DATA\Z261\DESIGN\CAD\ACTIVE
PLOTTED: JUNE 23 2020
PLOTTED BY: ECACCAVARI

SCALE
GRAPHIC SCALE
10 0 10
SCALE: 1" = 10'

SHEET C041.3

CONSTRUCTION NOTES

1. PROP CURB AND GUTTER (C-2) ARL STD (R-2.0)
1B. PROP REVERSE PITCH CURB & GUTTER (C2-R) ARL STD (CR-2.0)
1C. TRANSITION 10' BETWEEN PROP CURB AND REVERSE PITCH CURB
1D. 1' NOSE DOWN CURB, MATCH EXISTING GROUND
2. PROP SIDEWALK ARL STD (R-2.0)
2B. PROP RAMP (CG-12B) VDOT ROAD & BRIDGE STANDARDS (204.03) SEE SHEET C042.1 FOR CURB RAMP DETAILS
2C. REMOVE EXISTING SIDEWALK AND REPLACE WITH SOD BETWEEN DRIVEWAYS AT PROPERTIES #29 AND #31.
3. PROP RESIDENTIAL CONCRETE DRIVEWAY ENTRANCE (STANDARD) ARL STD (R-2.4A), SEE SHEET C002.1 - C002.2 FOR DRIVEWAY DETAILS
3A. PROP RESIDENTIAL CONCRETE DRIVEWAY ENTRANCE 2" DEPRESSION ARL STD (R-2.4B), SEE SHEET C002.1 - C002.2 FOR DRIVEWAY DETAILS
4. ADJUST EXISTING WATER METER TO PROPOSED GRADE
4A. ADJUST EXISTING WATER MANHOLE COVER TO PROPOSED GRADE
4C. ADJUST EXISTING WATER VALVE TO PROPOSED GRADE
4D. ADJUST EXISTING WATER METER TO PROPOSED GRADE. 9" CONCRETE SHALL BE PROVIDED AROUND BUMP-OUT WATER METERS. SEE SHEET C051.1 FOR DETAILS.
5. RELOCATE EXISTING WATER METER (ARLINGTON COUNTY STANDARD W-9.0)
5A. PROPOSED WATER MAIN AND SERVICE LINES (BY OTHERS) PRIOR TO STREET IMPROVEMENT CONSTRUCTION BETWEEN STA 0+50 AND STA 8+53, SEE PROJECT R085 FOR ADDITIONAL INFORMATION.
5B. RELOCATE EXISTING FIRE HYDRANT (BY OTHERS) PRIOR TO STREET IMPROVEMENT CONSTRUCTION SEE PROJECT R085 FOR ADDITIONAL INFORMATION.
6. REMOVE AND RESET EXISTING FENCE IN NEW LOCATION
6A. EXISTING FENCE TO REMAIN IN-PLACE DURING CONSTRUCTION UNLESS PROGRESS DICTATES OTHERWISE WHEREAS THE FENCE WILL THEN BE REMOVED AND RESET IN SAME LOCATION
6B. REMOVE AND RESET EXISTING FENCE IN SAME LOCATION
7. MATCH EXISTING SIDEWALK AND/OR CURB & GUTTER
7A. TRANSITION EXISTING LEAD WALK TO MEET PROPOSED SURFACE AND REPLACE WITH LIKE MATERIALS
7B. MATCH EXISTING ROADWAY SURFACE
7C. NEW CONCRETE STEPS ARLINGTON COUNTY STANDARD (R-3.0)
8. EXTEND EXISTING GUTTER DRAIN PIPE TO PROPOSED CURB. IF PROPOSED PIPE CANNOT MEET EXISTING PIPE'S GRADE, CONTRACTOR SHALL PROVIDE PROPOSED PIPE FROM PROPOSED FACE-OF-CURB TO RIGHT-OF-WAY LINE. ALL GUTTER DRAIN PIPE WORK SHALL BE UNDER THE GUIDANCE OF THE PROJECT OFFICER AND COORDINATE WITH THE PROPERTY OWNER.
9. ADJUST EXISTING SANITARY MANHOLE TO PROPOSED GRADE
9A. EXISTING MANHOLES FOR VERIZON VAULTS SHALL ONLY BE VERTICALLY ADJUSTED TO PROPOSED GRADE BY VERIZON CREWS
10. RELOCATE EXISTING UTILITY POLE AND ALL GUY WIRE(S), ARLINGTON COUNTY STANDARD (R-5.0) (BY OTHERS)
11. ADJUST EXISTING GAS VALVE TO PROPOSED GRADE
11A. REMOVE EXISTING GAS VALVE
11B. PROPOSED 2" GAS MAIN TO BE INSTALLED BY OTHERS PRIOR TO CONSTRUCTION
11C. EXISTING 2" GAS MAIN TO BE ABANDONED BY OTHERS PRIOR TO CONSTRUCTION
12. REMOVE AND RECONSTRUCT PAVING LAYOUT AS SHOWN ON PLAN WITH LIKE MATERIALS

ADDITIONAL NOTES

1. PLAN VIEW PROVIDED AT 10-SCALE FOR CLARITY.
2. TEST HOLE DATA IS AVAILABLE UPON CONTRACTOR REQUEST.
3. PROPOSED MILLING & SURFACE PAVING WILL BE PERFORMED BY OTHERS.
4. CONTRACTOR SHALL INSTALL 5" BASE COURSE AS PART OF FULL DEPTH ASPHALT. 2" SURFACE COURSE WILL BE PERFORMED BY OTHERS.
5. CONTRACTOR SHALL INSTALL DRIVEWAY CONNECTION BETWEEN CONCRETE APRON AND EXISTING DRIVEWAY WITH LIKE MATERIALS. CONTRACTOR SHALL PROVIDE 6" MINIMUM AGGREGATE BASE AND 4" SURFACE COURSE PAVING FOR PROPOSED ASPHALT DRIVEWAY CONNECTIONS.
6. NEW FRAME AND COVERS WITH SPECIAL SPIKED FRAME SHALL BE INSTALLED TO ALL WATER METERS CAST IN CONCRETE SEE SHEET C051.1 FOR DETAILS.
7. ALL PAVEMENT WIDENING SHALL BE PERFORMED IN ACCORDANCE WITH VDOT STANDARD WP-2 (303.02).

LEGEND

- 6"W - ABANDONED EXISTING WATER MAIN
- CR-# - CURB RAMP NUMBER
- D# - DRIVEWAY NUMBER

Revised: 01/21/2016

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DEPARTMENT OF
ENVIRONMENTAL SERVICES
FACILITIES & ENGINEERING DIVISION
ENGINEERING BUREAU
2100 CLARENDON BOULEVARD, SUITE 813
ARLINGTON, VA 22201
PHONE: 703.228.3629
FAX: 703.228.3606

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SEAL
COMMONWEALTH OF VIRGINIA
JIONG LIN
Lic. No. 0402051875
07/27/2020
PROFESSIONAL ENGINEER

APPROVALS	DATE
QUALITY CONTROL ENGINEER	7/28/2020
CONSTRUCTION MANAGEMENT SUPERVISOR	7.27.20
WATER, SEWER, STREETS BUREAU CHIEF	07.27.2020
TRANSPORTATION DIRECTOR	7/27/20
PROJECT MANAGER	7-27-20

REVISIONS	DATE

PROJECT NAME AND LOCATION
PLAN DETAILS II
N HIGHLAND STREET
1ST ROAD N
TO ARLINGTON BOULEVARD
Z261

DESIGNED: E CACCAVARI
DRAWN: E CACCAVARI
CHECKED: J LIN
MISS UTILITY TRANSMITTAL #5330

FILENAME: Z261-230-PLAN_PROFILE.DWG
PATH: Q:\DATA\Z261\DESIGN\CAD\ACTIVE
PLOTTED: JULY 30 2020
PLOTTED BY: ECACCAVARI

SCALE
GRAPHIC SCALE
10 0 10
SCALE: 1" = 10'

SHEET C041.4

CONSTRUCTION NOTES

- 1 — PROP CURB AND GUTTER (C-2) ARL STD (R-2.0)
- 1B — PROP REVERSE PITCH CURB & GUTTER (C2-R) ARL STD (CR-2.0)
- 1C — TRANSITION 10' BETWEEN PROP CURB AND REVERSE PITCH CURB
- 1D — 1' NOSE DOWN CURB, MATCH EXISTING GROUND
- 2 — PROP SIDEWALK ARL STD (R-2.0)
- 2B — PROP RAMP (CG-12B) VDOT ROAD & BRIDGE STANDARDS (204.03) SEE SHEET C042.1 FOR CURB RAMP DETAILS
- 2C — REMOVE EXISTING SIDEWALK AND REPLACE WITH SOD BETWEEN DRIVEWAYS AT PROPERTIES #29 AND #31.
- 3 — PROP RESIDENTIAL CONCRETE DRIVEWAY ENTRANCE (STANDARD) ARL STD (R-2.4A), SEE SHEET C002.1 - C002.2 FOR DRIVEWAY DETAILS
- 3A — PROP RESIDENTIAL CONCRETE DRIVEWAY ENTRANCE 2" DEPRESSION ARL STD (R-2.4B), SEE SHEET C002.1 - C002.2 FOR DRIVEWAY DETAILS
- 4 — ADJUST EXISTING WATER METER TO PROPOSED GRADE
- 4A — ADJUST EXISTING WATER MANHOLE COVER TO PROPOSED GRADE
- 4C — ADJUST EXISTING WATER VALVE TO PROPOSED GRADE
- 4D — ADJUST EXISTING WATER METER TO PROPOSED GRADE. 9" CONCRETE SHALL BE PROVIDED AROUND BUMP-OUT WATER METERS. SEE SHEET C051.1 FOR DETAILS.
- 5 — RELOCATE EXISTING WATER METER (ARLINGTON COUNTY STANDARD W-9.0)
- 5A — PROPOSED WATER MAIN AND SERVICE LINES (BY OTHERS) PRIOR TO STREET IMPROVEMENT CONSTRUCTION BETWEEN STA 0+50 AND STA 8+53, SEE PROJECT R085 FOR ADDITIONAL INFORMATION.
- 5B — RELOCATE EXISTING FIRE HYDRANT (BY OTHERS) PRIOR TO STREET IMPROVEMENT CONSTRUCTION SEE PROJECT R085 FOR ADDITIONAL INFORMATION.
- 6 — REMOVE AND RESET EXISTING FENCE IN NEW LOCATION
- 6A — EXISTING FENCE TO REMAIN IN-PLACE DURING CONSTRUCTION UNLESS PROGRESS DICTATES OTHERWISE WHEREAS THE FENCE WILL THEN BE REMOVED AND RESET IN SAME LOCATION
- 6B — REMOVE AND RESET EXISTING FENCE IN SAME LOCATION
- 7 — MATCH EXISTING SIDEWALK AND/OR CURB & GUTTER
- 7A — TRANSITION EXISTING LEAD WALK TO MEET PROPOSED SURFACE AND REPLACE WITH LIKE MATERIALS
- 7B — MATCH EXISTING ROADWAY SURFACE
- 7C — NEW CONCRETE STEPS ARLINGTON COUNTY STANDARD (R-3.0)
- 8 — EXTEND EXISTING GUTTER DRAIN PIPE TO PROPOSED CURB. IF PROPOSED PIPE CANNOT MEET EXISTING PIPE'S GRADE, CONTRACTOR SHALL PROVIDE PROPOSED PIPE FROM PROPOSED FACE-OF-CURB TO RIGHT-OF-WAY LINE. ALL GUTTER DRAIN PIPE WORK SHALL BE UNDER THE GUIDANCE OF THE PROJECT OFFICER AND COORDINATE WITH THE PROPERTY OWNER.
- 9 — ADJUST EXISTING SANITARY MANHOLE TO PROPOSED GRADE
- 9A — EXISTING MANHOLES FOR VERIZON VAULTS SHALL ONLY BE VERTICALLY ADJUSTED TO PROPOSED GRADE BY VERIZON CREWS
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- 11 — ADJUST EXISTING GAS VALVE TO PROPOSED GRADE
- 11A — REMOVE EXISTING GAS VALVE
- 11B — PROPOSED 2" GAS MAIN TO BE INSTALLED BY OTHERS PRIOR TO CONSTRUCTION
- 11C — EXISTING 2" GAS MAIN TO BE ABANDONED BY OTHERS PRIOR TO CONSTRUCTION
- 12 — REMOVE AND RECONSTRUCT PAVING LAYOUT AS SHOWN ON PLAN WITH LIKE MATERIALS

ADDITIONAL NOTES

1. PLAN VIEW PROVIDED AT 10-SCALE FOR CLARITY.
2. TEST HOLE DATA IS AVAILABLE UPON CONTRACTOR REQUEST.
3. PROPOSED MILLING & SURFACE PAVING WILL BE PERFORMED BY OTHERS.
4. CONTRACTOR SHALL INSTALL 5" BASE COURSE AS PART OF FULL DEPTH ASPHALT. 2" SURFACE COURSE WILL BE PERFORMED BY OTHERS.
5. CONTRACTOR SHALL INSTALL DRIVEWAY CONNECTION BETWEEN CONCRETE APRON AND EXISTING DRIVEWAY WITH LIKE MATERIALS. CONTRACTOR SHALL PROVIDE 6" MINIMUM AGGREGATE BASE AND 4" SURFACE COURSE PAVING FOR PROPOSED ASPHALT DRIVEWAY CONNECTIONS.
6. NEW FRAME AND COVERS WITH SPECIAL SPIKED FRAME SHALL BE INSTALLED TO ALL WATER METERS CAST IN CONCRETE SEE SHEET C051.1 FOR DETAILS.
7. ALL PAVEMENT WIDENING SHALL BE PERFORMED IN ACCORDANCE WITH VDOT STANDARD WP-2 (303.02).

LEGEND

- 6"W — ABANDONED EXISTING WATER MAIN
- CR-# — CURB RAMP NUMBER
- D# — DRIVEWAY NUMBER

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ARLINGTON VIRGINIA

DEPARTMENT OF ENVIRONMENTAL SERVICES
FACILITIES & ENGINEERING DIVISION
ENGINEERING BUREAU
2100 CLARENDON BOULEVARD, SUITE 813
ARLINGTON, VA 22201
PHONE: 703.228.3629
FAX: 703.228.3606

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SEAL
COMMONWEALTH OF VIRGINIA
JIONG LIN
Lic. No. 0402051875
04/07/2020
PROFESSIONAL ENGINEER

APPROVALS	DATE
	4/7/2020
QUALITY CONTROL ENGINEER Kamal N. Taktak	4.7.20
CONSTRUCTION MANAGEMENT SUPERVISOR David W. Hundelt	04.14.2020
WATER, SEWER, STREETS BUREAU CHIEF Dennis M. Leach.	04/13/20
TRANSPORTATION DIRECTOR Tim McIntosh	4/16/20
PROJECT MANAGER	

REVISIONS	DATE

PROJECT NAME AND LOCATION
PLAN DETAILS III
N HIGHLAND STREET
1ST ROAD N
TO ARLINGTON BOULEVARD
Z261

DESIGNED: E CACCAVARI
DRAWN: E CACCAVARI
CHECKED: J LIN
MISS UTILITY TRANSMITTAL #5330

FILENAME: Z261-230-PLAN_PROFILE.DWG
PATH: O:\DATA\Z261\DESIGN\CAD\ACTIVE
PLOTTED: JUNE 23 2020
PLOTTED BY: ECACCAVARI

SCALE
GRAPHIC SCALE
10 0 10
SCALE: 1" = 10'

SHEET C041.5

CONSTRUCTION NOTES

- 1 — PROP CURB AND GUTTER (C-2) ARL STD (R-2.0)
- 1B — PROP REVERSE PITCH CURB & GUTTER (C2-R) ARL STD (CR-2.0)
- 1C — TRANSITION 10' BETWEEN PROP CURB AND REVERSE PITCH CURB
- 1D — 1' NOSE DOWN CURB, MATCH EXISTING GROUND
- 2 — PROP SIDEWALK ARL STD (R-2.0)
- 2B — PROP RAMP (CG-12B) VDOT ROAD & BRIDGE STANDARDS (204.03) SEE SHEET C042.1 FOR CURB RAMP DETAILS
- 2C — REMOVE EXISTING SIDEWALK AND REPLACE WITH SOD BETWEEN DRIVEWAYS AT PROPERTIES #29 AND #31.
- 3 — PROP RESIDENTIAL CONCRETE DRIVEWAY ENTRANCE (STANDARD) ARL STD (R-2.4A), SEE SHEET C002.1 - C002.2 FOR DRIVEWAY DETAILS
- 3A — PROP RESIDENTIAL CONCRETE DRIVEWAY ENTRANCE 2" DEPRESSION ARL STD (R-2.4B), SEE SHEET C002.1 - C002.2 FOR DRIVEWAY DETAILS
- 4 — ADJUST EXISTING WATER METER TO PROPOSED GRADE
- 4A — ADJUST EXISTING WATER MANHOLE COVER TO PROPOSED GRADE
- 4C — ADJUST EXISTING WATER VALVE TO PROPOSED GRADE
- 4D — ADJUST EXISTING WATER METER TO PROPOSED GRADE. 9" CONCRETE SHALL BE PROVIDED AROUND BUMP-OUT WATER METERS. SEE SHEET C051.1 FOR DETAILS.
- 5 — RELOCATE EXISTING WATER METER (ARLINGTON COUNTY STANDARD W-9.0)
- 5A — PROPOSED WATER MAIN AND SERVICE LINES (BY OTHERS) PRIOR TO STREET IMPROVEMENT CONSTRUCTION BETWEEN STA 0+50 AND STA 8+53, SEE PROJECT R085 FOR ADDITIONAL INFORMATION.
- 5B — RELOCATE EXISTING FIRE HYDRANT (BY OTHERS) PRIOR TO STREET IMPROVEMENT CONSTRUCTION SEE PROJECT R085 FOR ADDITIONAL INFORMATION.
- 6 — REMOVE AND RESET EXISTING FENCE IN NEW LOCATION
- 6A — EXISTING FENCE TO REMAIN IN-PLACE DURING CONSTRUCTION UNLESS PROGRESS DICTATES OTHERWISE WHEREAS THE FENCE WILL THEN BE REMOVED AND RESET IN SAME LOCATION
- 6B — REMOVE AND RESET EXISTING FENCE IN SAME LOCATION
- 7 — MATCH EXISTING SIDEWALK AND/OR CURB & GUTTER
- 7A — TRANSITION EXISTING LEAD WALK TO MEET PROPOSED SURFACE AND REPLACE WITH LIKE MATERIALS
- 7B — MATCH EXISTING ROADWAY SURFACE
- 7C — NEW CONCRETE STEPS ARLINGTON COUNTY STANDARD (R-3.0)
- 8 — EXTEND EXISTING GUTTER DRAIN PIPE TO PROPOSED CURB. IF PROPOSED PIPE CANNOT MEET EXISTING PIPE'S GRADE, CONTRACTOR SHALL PROVIDE PROPOSED PIPE FROM PROPOSED FACE-OF-CURB TO RIGHT-OF-WAY LINE. ALL GUTTER DRAIN PIPE WORK SHALL BE UNDER THE GUIDANCE OF THE PROJECT OFFICER AND COORDINATE WITH THE PROPERTY OWNER.
- 9 — ADJUST EXISTING SANITARY MANHOLE TO PROPOSED GRADE
- 9A — EXISTING MANHOLES FOR VERIZON VAULTS SHALL ONLY BE VERTICALLY ADJUSTED TO PROPOSED GRADE BY VERIZON CREWS
- 10 — RELOCATE EXISTING UTILITY POLE AND ALL GUY WIRE(S), ARLINGTON COUNTY STANDARD (R-5.0) (BY OTHERS)
- 11 — ADJUST EXISTING GAS VALVE TO PROPOSED GRADE
- 11A — REMOVE EXISTING GAS VALVE
- 11B — PROPOSED 2" GAS MAIN TO BE INSTALLED BY OTHERS PRIOR TO CONSTRUCTION
- 11C — EXISTING 2" GAS MAIN TO BE ABANDONED BY OTHERS PRIOR TO CONSTRUCTION
- 12 — REMOVE AND RECONSTRUCT PAVING LAYOUT AS SHOWN ON PLAN WITH LIKE MATERIALS

ADDITIONAL NOTES

1. PLAN VIEW PROVIDED AT 10-SCALE FOR CLARITY.
2. TEST HOLE DATA IS AVAILABLE UPON CONTRACTOR REQUEST.
3. PROPOSED MILLING & SURFACE PAVING WILL BE PERFORMED BY OTHERS.
4. CONTRACTOR SHALL INSTALL 5" BASE COURSE AS PART OF FULL DEPTH ASPHALT. 2" SURFACE COURSE WILL BE PERFORMED BY OTHERS.
5. CONTRACTOR SHALL INSTALL DRIVEWAY CONNECTION BETWEEN CONCRETE APRON AND EXISTING DRIVEWAY WITH LIKE MATERIALS. CONTRACTOR SHALL PROVIDE 6" MINIMUM AGGREGATE BASE AND 4" SURFACE COURSE PAVING FOR PROPOSED ASPHALT DRIVEWAY CONNECTIONS.
6. NEW FRAME AND COVERS WITH SPECIAL SPIKED FRAME SHALL BE INSTALLED TO ALL WATER METERS CAST IN CONCRETE SEE SHEET C051.1 FOR DETAILS.
7. ALL PAVEMENT WIDENING SHALL BE PERFORMED IN ACCORDANCE WITH VDOT STANDARD WP-2 (303.02).

LEGEND

- 6"W — ABANDONED EXISTING WATER MAIN
- CR-# — CURB RAMP NUMBER
- D# — DRIVEWAY NUMBER

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ARLINGTON, VA 22201
PHONE: 703.228.3629
FAX: 703.228.3606

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SEAL
COMMONWEALTH OF VIRGINIA
JIONG LIN
Lic. No. 0402051875
04/07/2020
PROFESSIONAL ENGINEER

APPROVALS	DATE
	4/7/2020
QUALITY CONTROL ENGINEER Kamal N. Taktak	4.7.20
CONSTRUCTION MANAGEMENT SUPERVISOR David W. Hundelt	04.14.2020
WATER, SEWER, STREETS BUREAU CHIEF Dennis M. Leach.	04/13/20
TRANSPORTATION DIRECTOR Tim McIntosh	4/16/20
PROJECT MANAGER	

REVISIONS	DATE

PROJECT NAME AND LOCATION
PLAN DETAILS IV
N HIGHLAND STREET
1ST ROAD N
TO ARLINGTON BOULEVARD
Z261

DESIGNED: E CACCAVARI
DRAWN: E CACCAVARI
CHECKED: J LIN
MISS UTILITY TRANSMITTAL #5330

FILENAME: Z261-230-PLAN_PROFILE.DWG
PATH: Q:\DATA\Z261\DESIGN\CAD\ACTIVE
PLOTTED: JUNE 23 2020
PLOTTED BY: ECACCAVARI

SCALE
GRAPHIC SCALE
10 0 10
SCALE: 1" = 10'

SHEET C041.6

CR-1

CG-12B

N HIGHLAND ST & 1ST RD N

CR-3

CG-12B

N HIGHLAND ST & 1ST ST N

CR-4

CG-12B

N HIGHLAND ST & 1ST ST N

CR-5

MOD. CG-12B

N HIGHLAND ST & 1ST ST N

LEGEND

PROPOSED ELEVATION +258.67

EXISTING ELEVATION +258.67

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2100 CLARENDON BOULEVARD, SUITE 813
ARLINGTON, VA 22201
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04/07/2020
PROFESSIONAL ENGINEER

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	4/7/2020
QUALITY CONTROL ENGINEER Kamal N. Taktak	4.7.20
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WATER, SEWER, STREETS BUREAU CHIEF Dennis M. Leach.	04/13/20
TRANSPORTATION DIRECTOR Tim McIntosh	4/16/20
PROJECT MANAGER	

REVISIONS	DATE

PROJECT NAME AND LOCATION

RAMP DETAILS I

N HIGHLAND STREET
1ST ROAD N
TO ARLINGTON BOULEVARD

Z261

DESIGNED: E CACCAVARI
DRAWN: E CACCAVARI
CHECKED: J LIN
MISS UTILITY TRANSMITTAL #5330

FILENAME: Z261-208-RAMP_DETAILS.DWG
PATH: Q:\DATA\Z261\DESIGN\CAD\ACTIVE
PLOTTED: JUNE 23 2020
PLOTTED BY: ECACCAVARI

SCALE

GRAPHIC SCALE

5 0 5

SCALE: 1" = 5'

SHEET C042.1

CR-1 N HIGHLAND ST & 1ST RD N (BLK 1 - EOP - RT.)

CR-2 N HIGHLAND ST & 1ST ST N (BLK 1 - EOP - LT.)

CR-3 N HIGHLAND ST & 1ST ST N (BLK 2 - EOP - LT.)

CR-4 N HIGHLAND ST & 1ST ST N (BLK 1 - EOP - RT.)

CR-5 N HIGHLAND ST & 1ST ST N (BLK 2 - EOP - RT.)

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DEPARTMENT OF
ENVIRONMENTAL SERVICES
FACILITIES & ENGINEERING DIVISION
ENGINEERING BUREAU
2100 CLARENDON BOULEVARD, SUITE 813
ARLINGTON, VA 22201
PHONE: 703.228.3629
FAX: 703.228.3606

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SEAL
COMMONWEALTH OF VIRGINIA
JIONG LIN
Lic. No. 0402061875
07/27/2020
PROFESSIONAL ENGINEER

APPROVALS	DATE
QUALITY CONTROL ENGINEER	7/28/2020
CONSTRUCTION MANAGEMENT SUPERVISOR	7.27.20
WATER, SEWER, STREETS BUREAU CHIEF	07.27.2020
TRANSPORTATION DIRECTOR	7/27/20
PROJECT MANAGER	7-27-20

REVISIONS	DATE

PROJECT NAME AND LOCATION
CURB RETURN PROFILES

N HIGHLAND STREET
1ST ROAD N
TO ARLINGTON BOULEVARD
Z261

DESIGNED: E CACCAVARI
DRAWN: E CACCAVARI
CHECKED: J LIN
MISS UTILITY TRANSMITTAL #5330

FILENAME: Z261-232-CURB_RETURN_PROFILES.DWG
PATH: Q:\DATA\Z261\DESIGN\CAD\ACTIVE
PLOTTED: JULY 30 2020
PLOTTED BY: ECACCAVARI

SCALE
25 0 25
HORIZ: 1" = 25'
5 0 5
VERT: 1" = 5'

SHEET C043.1

1+75.00

1+50.00

1+25.00

1+00.00

0+97.00

0+75.00

2+69.00

2+50.00

2+33.00

2+25.00

2+15.00

2+00.00

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DEPARTMENT OF
ENVIRONMENTAL SERVICES
FACILITIES & ENGINEERING DIVISION
ENGINEERING BUREAU
2100 CLARENDON BOULEVARD, SUITE 813
ARLINGTON, VA 22201
PHONE: 703.228.3629
FAX: 703.228.3606

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SEAL

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JIONG LIN
Lic. No. 0402051875
04/07/2020
PROFESSIONAL ENGINEER

APPROVALS	DATE
	4/7/2020
QUALITY CONTROL ENGINEER Kamal N. Taktak	4.7.20
CONSTRUCTION MANAGEMENT SUPERVISOR David W. Hundelt	04.14.2020
WATER, SEWER, STREETS BUREAU CHIEF Dennis M. Leach.	04/13/20
TRANSPORTATION DIRECTOR Tim McAntosh	4/16/20
PROJECT MANAGER	

REVISIONS	DATE

PROJECT NAME AND LOCATION

CROSS SECTIONS I

N HIGHLAND STREET
1ST ROAD N
TO ARLINGTON BOULEVARD

Z261

DESIGNED: E CACCAVARI
DRAWN: E CACCAVARI
CHECKED: J LIN
MISS UTILITY TRANSMITTAL #5330

FILENAME: Z261-234-CROSS_SECTIONS.DWG
PATH: Q:\DATA\Z261\DESIGN\CAD\ACTIVE
PLOTTED: JUNE 23 2020
PLOTTED BY: ECACCAVARI

SCALE

5 0 5
VERT. SCALE
5 0 5
HORIZ. SCALE

SHEET C044.1

Revised: 01/21/2016

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4+00.00

3+78.00

3+75.00

3+50.00

3+00.00

2+75.00

5+00.00

4+77.00

4+75.00

4+67.00

4+50.00

4+25.00

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VIRGINIA

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ENVIRONMENTAL SERVICES
FACILITIES & ENGINEERING DIVISION
ENGINEERING BUREAU
2100 CLARENDON BOULEVARD, SUITE 813
ARLINGTON, VA 22201
PHONE: 703.228.3629
FAX: 703.228.3606

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JIONG LIN
Lic. No. 0402061875
07/27/2020
PROFESSIONAL ENGINEER

APPROVALS	DATE
QUALITY CONTROL ENGINEER	7/28/2020
CONSTRUCTION MANAGEMENT SUPERVISOR	7.27.20
WATER, SEWER, STREETS BUREAU CHIEF	07.27.2020
TRANSPORTATION DIRECTOR	7/27/20
PROJECT MANAGER	7-27-20

REVISIONS	DATE

PROJECT NAME AND LOCATION

CROSS SECTIONS II

N HIGHLAND STREET
1ST ROAD N
TO ARLINGTON BOULEVARD

Z261

DESIGNED: E CACCAVARI
DRAWN: E CACCAVARI
CHECKED: J LIN
MISS UTILITY TRANSMITTAL #5330

FILENAME: Z261-234-CROSS_SECTIONS.DWG
PATH: Q:\DATA\Z261\DESIGN\CAD\ACTIVE
PLOTTED: JULY 30 2020
PLOTTED BY: ECACCAVARI

SCALE

5 0 5
VERT. SCALE

5 0 5
HORIZ. SCALE

SHEET C044.2

Revised: 01/21/2016

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5+75.00

5+60.00

5+50.00

5+40.00

5+34.00

5+25.00

6+25.00

6+22.00

6+14.00

6+07.64

6+00.00

5+87.00

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VIRGINIA

DEPARTMENT OF
ENVIRONMENTAL SERVICES
FACILITIES & ENGINEERING DIVISION
ENGINEERING BUREAU
2100 CLARENDON BOULEVARD, SUITE 813
ARLINGTON, VA 22201
PHONE: 703.228.3629
FAX: 703.228.3606

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WATER, SEWER, STREETS BUREAU CHIEF Dennis M. Leach.	04/13/20
TRANSPORTATION DIRECTOR Tim McIntosh	4/16/20
PROJECT MANAGER	

REVISIONS	DATE

PROJECT NAME AND LOCATION
CROSS SECTIONS III
N HIGHLAND STREET
1ST ROAD N
TO ARLINGTON BOULEVARD
Z261

DESIGNED: E CACCAVARI
DRAWN: E CACCAVARI
CHECKED: J LIN
MISS UTILITY TRANSMITTAL #5330

FILENAME: Z261-234-CROSS_SECTIONS.DWG
PATH: Q:\DATA\Z261\DESIGN\CAD\ACTIVE
PLOTTED: JUNE 23 2020
PLOTTED BY: ECACCAVARI

SCALE
5 0 5
VERT. SCALE
5 0 5
HORIZ. SCALE

SHEET C044.3

Revised: 01/21/2016

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7+25.00

7+14.00

7+00.00

6+82.00

6+75.00

6+50.00

7+87.61
MATCH EXISTING PAVEMENT

7+75.00

7+72.00

7+53.00

7+50.00

7+42.00

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2100 CLARENDON BOULEVARD, SUITE 813
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APPROVALS	DATE
	4/7/2020
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CONSTRUCTION MANAGEMENT SUPERVISOR David W. Hundelt	04.14.2020
WATER, SEWER, STREETS BUREAU CHIEF Dennis M. Leach.	04/13/20
TRANSPORTATION DIRECTOR Tim McAntosh	4/16/20
PROJECT MANAGER	

REVISIONS	DATE

PROJECT NAME AND LOCATION
CROSS SECTIONS IV
N HIGHLAND STREET
1ST ROAD N
TO ARLINGTON BOULEVARD
Z261

DESIGNED: E CACCAVARI
DRAWN: E CACCAVARI
CHECKED: J LIN
MISS UTILITY TRANSMITTAL #5330

FILENAME: Z261-234-CROSS_SECTIONS.DWG
PATH: Q:\DATA\Z261\DESIGN\CAD\ACTIVE
PLOTTED: JUNE 23 2020
PLOTTED BY: ECACCAVARI

SCALE
5 0 5
VERT. SCALE
5 0 5
HORIZ. SCALE

SHEET C044.4

Revised: 01/21/2016

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ALIGNMENT: PROP. N HIGHLAND ST										
Curve/Line #	Length	Radius	Line/Chord Bearing	Chord Length	Delta (Δ)	Tangent	STA (Start)	STA (End)	Northing, Easting (Start)	Northing, Easting (End)
L1	385.12'		S18° 30' 55.69"E				0+00.00	3+85.12	7004914.88, 11883469.83	7004549.69, 11883592.13
L2	249.40'		S18° 43' 55.69"E				3+85.12	6+34.52	7004549.69, 11883592.13	7004313.50, 11883672.23
L3	115.88'		S18° 22' 32.63"E				6+34.52	7+50.40	7004313.50, 11883672.23	7004203.53, 11883708.76
L4	293.35'		S18° 54' 31.92"E				7+50.40	10+43.75	7004203.53, 11883708.76	7003926.01, 11883803.82

ALIGNMENT: PROP. 1ST ST N (EAST)										
Curve/Line #	Length	Radius	Line/Chord Bearing	Chord Length	Delta (Δ)	Tangent	STA (Start)	STA (End)	Northing, Easting (Start)	Northing, Easting (End)
L6	84.73'		N71° 25' 15.94"E				0+00.00	0+84.73	7004606.87, 11883572.98	7004633.86, 11883653.30

ALIGNMENT: PROP. 1ST ST N (WEST)										
Curve/Line #	Length	Radius	Line/Chord Bearing	Chord Length	Delta (Δ)	Tangent	STA (Start)	STA (End)	Northing, Easting (Start)	Northing, Easting (End)
L7	125.95'		N71° 21' 04.31"E				0+00.00	1+25.95	7004566.02, 11883453.84	7004606.29, 11883573.18

ALIGNMENT: BLK 1 - EOP - LT										
Curve/Line #	Length	Radius	Line/Chord Bearing	Chord Length	Delta (Δ)	Tangent	STA (Start)	STA (End)	Northing, Easting (Start)	Northing, Easting (End)
C3	10.25'	13.50'	S3° 14' 32.71"W	10.01'	43° 30' 57"	5.39	0+10.65	0+20.90	7004747.08, 11883541.58	7004737.09, 11883541.01
C4	12.53'	16.50'	S3° 14' 32.71"W	12.23'	43° 30' 57"	6.59	0+20.90	0+33.43	7004737.09, 11883541.01	7004724.87, 11883540.32
C5	10.44'	16.50'	S36° 38' 24.47"E	10.27'	36° 14' 58"	5.40	0+70.94	0+81.38	7004689.31, 11883552.23	7004681.07, 11883558.36
C6	9.17'	14.50'	S36° 38' 24.47"E	9.02'	36° 14' 58"	4.75	0+81.38	0+90.55	7004681.07, 11883558.36	7004673.83, 11883563.74
C7	33.80'	21.50'	S63° 32' 49.88"E	30.42'	90° 03' 48"	21.52	1+28.95	1+62.75	7004637.42, 11883575.93	7004623.87, 11883603.17
L11	10.65'		S18° 30' 55.69"E				0+00.00	0+10.65	7004757.18, 11883538.20	7004747.08, 11883541.58
L12	37.51'		S18° 30' 55.69"E				0+33.43	0+70.94	7004724.87, 11883540.32	7004689.31, 11883552.23
L13	38.40'		S18° 30' 55.69"E				0+90.55	1+28.95	7004673.83, 11883563.74	7004637.42, 11883575.93
L14	7.37'		N71° 25' 33.06"E				1+62.75	1+70.12	7004623.87, 11883603.17	7004626.22, 11883610.16

ALIGNMENT: BLK 1 - EOP - RT										
Curve/Line #	Length	Radius	Line/Chord Bearing	Chord Length	Delta (Δ)	Tangent	STA (Start)	STA (End)	Northing, Easting (Start)	Northing, Easting (End)
C1	33.77'	21.50'	S63° 31' 03.85"E	30.41'	90° 00' 16"	21.50	0+10.00	0+43.77	7004849.22, 11883455.97	7004835.66, 11883483.18
C2	18.04'	11.50'	S26° 25' 04.31"W	16.24'	89° 52' 00"	11.47	2+71.29	2+89.33	7004619.91, 11883555.43	7004605.36, 11883548.21
L8	10.00'		N71° 28' 48.00"E				0+00.00	0+10.00	7004846.04, 11883446.48	7004849.22, 11883455.97
L9	227.52'		S18° 30' 55.69"E				0+43.77	2+71.29	7004835.66, 11883483.18	7004619.91, 11883555.43
L10	5.38'		S71° 21' 04.31"W				2+89.33	2+94.71	7004605.36, 11883548.21	7004603.64, 11883543.11

ALIGNMENT: BLK 2 - EOP - LT										
Curve/Line #	Length	Radius	Line/Chord Bearing	Chord Length	Delta (Δ)	Tangent	STA (Start)	STA (End)	Northing, Easting (Start)	Northing, Easting (End)
C9	41.70'	26.50'	S26° 20' 40.12"W	37.53'	90° 09' 12"	26.57	0+20.87	0+62.56	7004612.14, 11883612.21	7004578.51, 11883595.56
L19	20.87'		S71° 25' 15.94"W				0+00.00	0+20.87	7004618.79, 11883631.99	7004612.14, 11883612.21
L20	275.63'		S18° 43' 55.69"E				0+62.56	3+38.20	7004578.51, 11883595.56	7004317.48, 11883684.08
L21	92.63'		S18° 22' 32.63"E				3+38.20	4+30.83	7004317.48, 11883684.08	7004229.57, 11883713.28
L22	60.41'		S17° 07' 52.35"E				4+30.83	4+91.24	7004229.57, 11883713.28	7004171.84, 11883731.07
L23	116.22'		S19° 43' 34.60"E				4+91.24	6+07.46	7004171.84, 11883731.07	7004062.44, 11883770.30

ALIGNMENT: BLK 2 - EOP - RT										
Curve/Line #	Length	Radius	Line/Chord Bearing	Chord Length	Delta (Δ)	Tangent	STA (Start)	STA (End)	Northing, Easting (Start)	Northing, Easting (End)
C12	18.05'	11.50'	S63° 41' 25.69"E	16.25'	89° 55' 00"	11.48	0+15.02	0+33.07	7004591.45, 11883552.65	7004584.24, 11883567.22
L15	15.02'		N71° 16' 56.58"E				0+00.00	0+15.02	7004586.63, 11883538.42	7004591.45, 11883552.65
L16	290.09'		S18° 43' 55.69"E				0+33.07	3+23.16	7004584.24, 11883567.22	7004309.52, 11883660.38
L17	115.77'		S18° 22' 32.63"E				3+23.16	4+38.93	7004309.52, 11883660.38	7004199.65, 11883696.87
L18	153.60'		S18° 54' 30.38"E				4+38.93	5+92.53	7004199.65, 11883696.87	7004054.34, 11883746.65

SURVEY CONTROL
51,7004342.845,11883650.573,250.813,FLY 51
75,7004760.008,11883532.732,261.000,FLY 75
151,7004166.460,11883730.701,242.341,TRV 151
152,7004589.089,11883566.664,259.212,TRV 152
153,7004881.792,11883493.400,257.316,TRV 153
266,7004102.784,11883837.112,237.778,TRV

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VIRGINIA

DEPARTMENT OF
ENVIRONMENTAL SERVICES
FACILITIES & ENGINEERING DIVISION
ENGINEERING BUREAU
2100 CLARENDON BOULEVARD, SUITE 813
ARLINGTON, VA 22201
PHONE: 703.228.3629
FAX: 703.228.3606

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SEAL
COMMONWEALTH OF VIRGINIA
JIONG LIN
Lic. No. 0402061875
07/27/2020
PROFESSIONAL ENGINEER

APPROVALS	DATE
QUALITY CONTROL ENGINEER	7/28/2020
CONSTRUCTION MANAGEMENT SUPERVISOR	7.27.20
WATER, SEWER, STREETS BUREAU CHIEF	07.27.2020
TRANSPORTATION DIRECTOR	7/27/20
PROJECT MANAGER	Tim McAntosh 7-27-20

REVISIONS	DATE

PROJECT NAME AND LOCATION
GEOMETRIC CONTROL PLAN I

N HIGHLAND STREET
1ST ROAD N
TO ARLINGTON BOULEVARD
Z261

DESIGNED: E CACCAVARI
DRAWN: E CACCAVARI
CHECKED: J LIN
MISS UTILITY TRANSMITTAL #5330

FILENAME: Z261-216-GEOMETRIC_CONTROL_PLAN.DWG
PATH: O:\DATA\Z261\DESIGN\CAD\ACTIVE
PLOTTED: JULY 30 2020
PLOTTED BY: ECACCAVARI

SCALE Hor: 1" = 25'
GRAPHIC SCALE
25 0 25
SCALE: 1" = 25'

SHEET C045.1

ALIGNMENT: PD-WAT-Z261										
Curve/Line #	Length	Radius	Line/Chord Bearing	Chord Length	Delta (Δ)	Tangent	STA (Start)	STA (End)	Northing, Easting (Start)	Northing, Easting (End)
L24	27.49'		N18° 33' 19.11"W				0+00.00	0+27.49	7004020.50, 11883757.77	7004046.56, 11883749.02
L25	5.07'		N25° 12' 30.26"E				0+27.49	0+32.57	7004046.56, 11883749.02	7004051.15, 11883751.18
L26	58.12'		N18° 41' 28.77"W				0+32.57	0+90.69	7004051.15, 11883751.18	7004106.21, 11883732.55

ALIGNMENT: PD-WAT-RT50 6in										
Curve/Line #	Length	Radius	Line/Chord Bearing	Chord Length	Delta (Δ)	Tangent	STA (Start)	STA (End)	Northing, Easting (Start)	Northing, Easting (End)
L27	19.38'		N70° 52' 33.47"E				0+00.00	0+19.38	7004050.14, 11883703.82	7004056.49, 11883722.14
L28	13.25'		N48° 22' 32.39"E				0+19.38	0+32.63	7004056.49, 11883722.14	7004065.29, 11883732.04
L29	13.60'		N71° 46' 05.95"E				0+32.63	0+46.23	7004065.29, 11883732.04	7004069.54, 11883744.96

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DEPARTMENT OF
ENVIRONMENTAL SERVICES
FACILITIES & ENGINEERING DIVISION
ENGINEERING BUREAU
2100 CLARENDON BOULEVARD, SUITE 813
ARLINGTON, VA 22201
PHONE: 703.228.3629
FAX: 703.228.3606

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SEAL
COMMONWEALTH OF VIRGINIA
JIONG LIN
Lic. No. 0402051875
04/07/2020
PROFESSIONAL ENGINEER

APPROVALS	DATE
	4/7/2020
QUALITY CONTROL ENGINEER Kamal N. Taktak	4.7.20
CONSTRUCTION MANAGEMENT SUPERVISOR David W. Hundelt	04.14.2020
WATER, SEWER, STREETS BUREAU CHIEF Dennis M. Leach.	04/13/20
TRANSPORTATION DIRECTOR Tim McIntosh	4/16/20
PROJECT MANAGER	

REVISIONS	DATE

PROJECT NAME AND LOCATION
GEOMETRIC CONTROL PLAN II

N HIGHLAND STREET
1ST ROAD N
TO ARLINGTON BOULEVARD
Z261

DESIGNED: E CACCAVARI
DRAWN: E CACCAVARI
CHECKED: J LIN
MISS UTILITY TRANSMITTAL #5330

FILENAME: Z261-216-GEOMETRIC_CONTROL_PLAN.DWG
PATH: Q:\DATA\Z261\DESIGN\CAD\ACTIVE
PLOTTED: JUNE 23 2020
PLOTTED BY: ECACCAVARI

SCALE Hor: 1" = 25'
GRAPHIC SCALE
25 0 25
SCALE: 1" = 25'

SHEET C045.2

Revised: 01/21/2016
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SPIKED WATER METER COVER DETAIL

NOTES:

1. ALL WATER METERS CAST IN CONCRETE SHALL BE EQUIPPED WITH A SPIKED WATER METER COVER.
2. THERE SHALL BE A MINIMUM OF 9" OF CONCRETE AROUND ALL PROPOSED WATER METER COVERS.

PROPOSED 8" WATERMAIN ALONG N HIGHLAND ST

H. GRAPHIC SCALE
25 0 25
SCALE: 1" = 25'

VERT. GRAPHIC SCALE
5 0 5
SCALE: 1" = 5'

PROPOSED 6" WATERMAIN ALONG ARLINGTON BLVD TRAIL

H. GRAPHIC SCALE
25 0 25
SCALE: 1" = 25'

VERT. GRAPHIC SCALE
5 0 5
SCALE: 1" = 5'

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FACILITIES & ENGINEERING DIVISION
ENGINEERING BUREAU
2100 CLARENDON BOULEVARD, SUITE 813
ARLINGTON, VA 22201
PHONE: 703.228.3629
FAX: 703.228.3606

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COMMONWEALTH OF VIRGINIA
JIONG LIN
Lic. No. 0402051875
04/07/2020
PROFESSIONAL ENGINEER

APPROVALS	DATE
	4/7/2020
QUALITY CONTROL ENGINEER Kamal N. Taktak	4.7.20
CONSTRUCTION MANAGEMENT SUPERVISOR David W. Hundelt	04.14.2020
WATER, SEWER, STREETS BUREAU CHIEF Dennis M. Leach.	04/13/20
TRANSPORTATION DIRECTOR Tim McAntosh	4/16/20
PROJECT MANAGER	

REVISIONS	DATE

PROJECT NAME AND LOCATION

WATERMAIN PLAN AND PROFILE

N HIGHLAND STREET
1ST ROAD N
TO ARLINGTON BOULEVARD

Z261

DESIGNED: E CACCAVARI
DRAWN: E CACCAVARI
CHECKED: J LIN
MISS UTILITY TRANSMITTAL #5330

FILENAME: Z261-240-WATERMAIN_P_AND_P.DWG
PATH: Q:\DATA\Z261\DESIGN\CAD\ACTIVE
PLOTTED: JUNE 23 2020
PLOTTED BY: ECACCAVARI

SCALE
AS NOTED

SHEET C051.1

Revised: 01/21/2016

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NOTES AND LEGEND:

[#]—[#] - EXISTING NUMBERED STORM STRUCTURE AND PIPE.

1. DATA ON THIS SHEET IS FROM ARLINGTON COUNTY GIS.

THIS SHEET FOR DRAINAGE DIVIDE PURPOSES ONLY

Revised: 01/21/2016

ARLINGTON
VIRGINIA

DEPARTMENT OF ENVIRONMENTAL SERVICES
FACILITIES & ENGINEERING DIVISION
ENGINEERING BUREAU
2100 CLARENDON BOULEVARD, SUITE 813
ARLINGTON, VA 22201
PHONE: 703.228.3629
FAX: 703.228.3606

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COMMONWEALTH OF VIRGINIA
JIONG LIN
Lic. No. 0402051875
04/07/2020
PROFESSIONAL ENGINEER

APPROVALS	DATE
	4/7/2020
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CONSTRUCTION MANAGEMENT SUPERVISOR David W. Hundelt	04.14.2020
WATER, SEWER, STREETS BUREAU CHIEF Dennis M. Leach.	04/13/20
TRANSPORTATION DIRECTOR Tim McAntosh	4/16/20
PROJECT MANAGER	

REVISIONS	DATE

PROJECT NAME AND LOCATION
EXISTING STORM SEWER DRAINAGE DIVIDES
N HIGHLAND STREET
1ST ROAD N
TO ARLINGTON BOULEVARD
Z261

DESIGNED: E CACCAVARI
DRAWN: E CACCAVARI
CHECKED: J LIN
MISS UTILITY TRANSMITTAL #5330

FILENAME: Z261-250-DRAINAGE_DIVIDES.DW
PATH: Q:\DATA\Z261\DESIGN\CAD\ACTIVE
PLOTTED: JUNE 23 2020
PLOTTED BY: ECACCAVARI

SCALE
GRAPHIC SCALE
60 0 60
SCALE: 1" = 60'

SHEET C071.1

NOTES AND LEGEND:

[#]—[#] - EXISTING NUMBERED STORM STRUCTURE AND PIPE.

1. DATA ON THIS SHEET IS FROM ARLINGTON COUNTY GIS.

THIS SHEET FOR DRAINAGE DIVIDE PURPOSES ONLY

Revised: 01/21/2016

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VIRGINIA

DEPARTMENT OF
ENVIRONMENTAL SERVICES

FACILITIES & ENGINEERING DIVISION
ENGINEERING BUREAU
2100 CLARENDON BOULEVARD, SUITE 813
ARLINGTON, VA 22201
PHONE: 703.228.3629
FAX: 703.228.3606

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COMMONWEALTH OF VIRGINIA
JIONG LIN
Lic. No. 0402051875
04/07/2020
PROFESSIONAL ENGINEER

APPROVALS	DATE
	4/7/2020
QUALITY CONTROL ENGINEER Kamal N. Taktak	4.7.20
CONSTRUCTION MANAGEMENT SUPERVISOR David W. Hundelt	04.14.2020
WATER, SEWER, STREETS BUREAU CHIEF Dennis M. Leach.	04/13/20
TRANSPORTATION DIRECTOR Tim McAntosh	4/16/20
PROJECT MANAGER	

REVISIONS	DATE

PROJECT NAME AND LOCATION
PROPOSED STORM SEWER
DRAINAGE DIVIDES

N HIGHLAND STREET
1ST ROAD N
TO ARLINGTON BOULEVARD

Z261

DESIGNED: E CACCAVARI
DRAWN: E CACCAVARI
CHECKED: J LIN
MISS UTILITY TRANSMITTAL #5330

FILENAME: Z261-250-DRAINAGE_DIVIDES.DW
PATH: Q:\DATA\Z261\DESIGN\CAD\ACTIVE
PLOTTED: JUNE 23 2020
PLOTTED BY: ECACCAVARI

SCALE
GRAPHIC SCALE
60 0 60
SCALE: 1" = 60'

SHEET C071.2

STORM SEWER DESIGN COMPUTATIONS

Project: Z261

From Point	To Point	Drainage Area	C Factor	C x A Increment	C x A Cumm.	Inlet Time Min.	Rain Fall In/Hr	Runoff Q C.F.S.	Invert Elev. Upper End	Invert Elev. Lower End	Length FT.	Slope %	Dia. IN.	Capacity Q C.F.S.	VEL. F.P.S.	Flow Time MIN.	Remarks	Structure Top Elevation	Pipe Coefficient	US Structure 1	US Structure 2	US Structure 3
*	EXISTING STORM SYSTEM DRAINING TOWARDS INTERSECTION OF N GARFIELD ST/1ST ST N																					
11765	11802	2.67	0.60	1.60	1.60	5	6.79	10.88	250.34	249.79	63.86	0.86%	18	9.77	5.53	0.19	Capacity Exceeded	256.02	0.013			
11802	11833	0.62	0.60	0.37	2.95	5	6.79	20.01	249.55	249.44	52.75	0.21%	24	10.36	3.30	0.27	Capacity Exceeded	255.15	0.013	11765	11796	
11833	11842	0.00	0.00	0.00	2.95	5	6.79	20.01	247.43	247.23	16.62	1.20%	21	17.43	7.25	0.04	Capacity Exceeded	256.57	0.013	11802		
11842	11799	0.00	0.00	0.00	2.95	5	6.79	20.01	247.39	243.61	224.60	1.68%	21	20.61	9.76	0.38		257.36	0.013	11833		
11796	11802	1.77	0.55	0.97	0.97	5	6.79	6.61	252.64	251.64	35.51	2.82%	15	10.87	9.29	0.06		255.69	0.013			
*																						
11806	11799	1.07	0.55	0.59	0.59	5	6.79	4.00	245.70	244.68	18.40	5.54%	15	15.25	10.47	0.03		250.90	0.013			
*																						
*	EXISTING STORM SYSTEM DRAINING TOWARDS S HIGHLAND ST																					
12490	12548	0.93	0.65	0.60	0.60	5	6.79	4.10	231.44	227.19	94.50	4.50%	15	13.74	9.77	0.16		233.93	0.013			
12548	12572	0.13	0.70	0.09	0.70	5	6.79	4.72	219.80	218.27	27.60	5.54%	15	15.25	10.96	0.04		230.44	0.013	12490		
*																						
12494	12554	0.80	0.65	0.52	0.52	5	6.79	3.53	230.83	224.77	92.68	6.54%	15	16.56	10.73	0.14		234.16	0.013			
*																						
*	EXISTING STORM SYSTEM DRAINING ALONG 1ST ST N TOWARDS N IRVING ST																					
12122	12143	1.37	0.60	0.82	0.82	5	6.79	5.58	240.34	239.84	23.50	2.13%	18	15.36	8.00	0.05			0.013			
12143	12168	0.49	0.65	0.32	1.14	5	6.79	7.74	239.84	238.70	85.60	1.33%	18	12.15	7.29	0.20			0.013	12122		
*																						
*	EXISTING STORM SYSTEM DRAINING ALONG 1ST ST N TOWARDS N FENWICK ST																					
11907	11913	0.96	0.60	0.58	0.58	5	6.79	3.91	245.90	245.71	16.80	1.13%	15	6.89	5.79	0.05		249.70	0.013			
*																						
11933	11913	1.19	0.65	0.77	0.77	5	6.79	5.25	246.01	245.71	18.00	1.67%	15	8.36	7.20	0.04		249.31	0.013			
*																						
*	GENERAL ASSUMPTIONS																					
*	Existing pipe diameters, lengths, inverts, & tops from survey (unless otherwise noted). Lag time not considered in this analysis. C-Factors based on existing conditions GIS data and standard C-Factor tables.																					
*	Proposed structure top elevations reflect design elevation. Existing structure top elevations reflect surveyed elevation.																					
*	Numbers in blue: information from GIS Data, Numbers in brown, information from N515 Survey data																					

STORM SEWER INLET COMPUTATIONS

Project: Z261

INLET NUMBER	TYPE	LENGTH	STATION	DRAINAGE AREA	C	C x A	C x A W	INTENSITY	Q INCR	Q CARRY OVER	Q TOTAL	S LONGITUDINAL (GUTTER) SLOPE, ft/ft	Sx CROSS SLOPE (OF THE ROAD)	T SPREAD	W WIDTH OF GUTTER PAN	W/T WIDTH/SPREAD	Sw CROSS SLOPE (OF THE GUTTER)	Sw/Sx	Eo GUTTER FLOW RATIO	a Total Depression	S'w	Se Equivalent cross slope	Lt Req. for 100%	P PERIMETEROFGRATE	L/Lt	d Depth of flow @ sag (feet)	E Inlet Effeciency	h Actual height of curb opening	Q INT	d/H	Qb CARRY OVER	T SPREAD AT SAG	REMARKS
*	PROPOSED CONDITIONS AT-GRADE STORM INLETS																																
12122	CB-2	7.5		1.36	0.60	0.82	0.82	4.00	3.26	0.00	3.26	0.012	0.0300	7.80	1.5	0.19	0.0833	2.78	0.51	2.46	0.14	0.10	12.99		0.58		0.79		2.57		0.69		Qb to down stream
12143	CB-2	7.5		0.49	0.65	0.32	0.32	4.00	1.27	0.00	1.27	0.017	0.0300	4.76	1.5	0.32	0.0833	2.78	0.74	2.46	0.14	0.13	8.21		0.91		0.99		1.26		0.02		Qb to down stream
11907	CB-2	7.5		0.98	0.60	0.59	0.59	4.00	2.35	0.00	2.35	0.008	0.0200	9.47	1.5	0.16	0.0833	4.17	0.47	2.64	0.15	0.09	10.73		0.70		0.88		2.08		0.27		Qb to down stream
11933	CB-2	7.5		1.19	0.65	0.77	0.77	4.00	3.09	0.00	3.09	0.008	0.0200	10.64	1.5	0.14	0.0833	4.17	0.42	2.64	0.15	0.08	12.66		0.59		0.80		2.48		0.62		Qb to down stream
*	PROPOSED CONDITIONS YARD INLETS/GRATE INLETS																																
11802	Yard Inlet	4		0.62	0.60	0.37	0.37	4.00	1.49	0.00	1.49													4		0.25							
12490	DI-7	12		0.93	0.65	0.60	0.60	4.00	2.42	0.00	2.42													6		0.26							
12494	DI-7	12		0.80	0.65	0.52	0.52	4.00	2.08	0.00	2.08													6		0.24							
*	PROPOSED CONDITIONS SUMP/SAG STORM INLETS																																
11796	CB-2A	7.5		1.10	0.50	0.55	0.55	4.00	2.20	0.00	2.20	0.016	0.0360	5.57	1.5		0.0833	2.31								0.282		0.46		0.61		7.84	
				0.52	0.65	0.34	0.34	4.00	1.35	0.00	1.35			4.48																			
11796	CB-2A	7.5		1.10	0.50	0.55	0.55	6.50	3.58	0.00	3.58	0.016	0.0360	6.84	1.5		0.0833	2.31								0.391		0.46		0.85		10.86	
				0.52	0.65	0.34	0.34	6.50	2.20	0.00	2.20			5.57																			
11806	CB-2A	7.5		0.70	0.60	0.42	0.42	4.00	1.68	0.00	1.68	0.018	0.0320	5.15	1.5		0.0833	2.60								0.243		0.46		0.53		7.60	
				0.53	0.55	0.29	0.29	4.00	1.17	0.00	1.17			4.33																			
11806	CB-2A	7.5		0.70	0.60	0.42	0.42	6.50	2.73	0.00	2.73	0.018	0.0320	6.39	1.5		0.0833	2.60								0.337		0.46		0.73		10.53	
				0.53	0.55	0.29	0.29	6.50	1.89	0.00	1.89			5.44																			
*	GENERAL ASSUMPTIONS																																
*	Assume standard dimensions for Arlington County CB-2 and CB-2A catch basins.																																
*	Assume standard dimensions for Arlington County and VDOT curb & gutter (1.5' wide and 2' wide gutter pans, and 0.0833 gutter pan cross slope). Assume standard road cross slope (one inch per foot, or 0.0208) unless otherwise noted.																																
*	Gutter longitudinal slope computed from survey or GIS topographic data, unless otherwise noted.																																
*	Throat lengths for County Standard CB-2, CB-2A, & CB-2B storm structures account for 6 inches of concrete on either side of the opening & the physical/nominal structure length has been reduced by 1 foot to reflect the effective inlet weir length.																																
*	Sump/sag inlets evaluated using a storm intensity of 4.0 inches/hour, and a check-storm intensity of 6.5 inches/hour to confirm that runoff does not escape the roadway and does not impact adjacent properties.																																

Revised: 01/21/2016

ARLINGTON VIRGINIA

DEPARTMENT OF ENVIRONMENTAL SERVICES
FACILITIES & ENGINEERING DIVISION
ENGINEERING BUREAU
2100 CLARENDON BOULEVARD, SUITE 813
ARLINGTON, VA 22201
PHONE: 703.228.3629
FAX: 703.228.3606

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COMMONWEALTH OF VIRGINIA
JIONG LIN
Lic. No. 0402051875
04/07/2020
PROFESSIONAL ENGINEER

APPROVALS	DATE
	4/7/2020
QUALITY CONTROL ENGINEER Kamal N. Taktak	4.7.20
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WATER, SEWER, STREETS BUREAU CHIEF Dennis M. Leach.	04/13/20
TRANSPORTATION DIRECTOR Tim McIntosh	4/16/20
PROJECT MANAGER	

REVISIONS	DATE

PROJECT NAME AND LOCATION
STORM SEWER COMPUTATIONS I

N HIGHLAND STREET
1ST ROAD N
TO ARLINGTON BOULEVARD

Z261

DESIGNED: E CACCAVARI
DRAWN: E CACCAVARI
CHECKED: J LIN
MISS UTILITY TRANSMITTAL #5330

FILENAME: Z261-250-DRAINAGE_DIVIDES.DW
PATH: Q:\DATA\Z261\DESIGN\CAD\ACTIVE
PLOTTED: JUNE 23 2020
PLOTTED BY: ECACCAVARI

SCALE
N/A

SHEET
C075.1

HYDRAULIC GRADE LINE COMPUTATIONS

Project: Z261

INLET STATION (1)	UP STREAM INLET	Outlet Water Surface Elev. (2)	FRICTION LOSSES Do in (3)	Qo cfs (4)	Lo ft (5)	Sfo % -6	Hf ft (7)	JUNCTION LOSSES Exit Loss Vo (8)	Ho (9)	Entrance Loss Qi (10)	Vi (11)	QiVi (12)	2 Vi /2g	Hi (13)	Bend Loss Angle (14)	Hd (15)	Junction Loss Adjustments Ht (16)	1.3 Ht (17)	0.5 Ht (18)	FINAL H (Junction + Friction Losses) (19)	Inlet Water Surface Elev. (20)	RIM ELEV. (21)	max @ inlet	pre-hgl 10yr-wse	inv1val	inv2val	inv3val	Structure has no plunging losses.	Structure has inlet shaping.
PROPOSED CONDITIONS HGL																													
*	**HGL analysis provided for existing structure 11799**																												
*	**Tailwater Assumptions (highest WSEL controls):**																												
*	**80% full flow WSEL entering structure #11799 from structure #11842 = 243.61' + (1.75' x 0.8) = 245.01'.**																												
11799																					**245.01**	**250.01**	245.01	245.01				**TRUE**	**FALSE**
*	**This analysis uses tailwater based on assumption of full coincident peaks and consideration of downstream backwater from structure #EX35.**																												
11842		245.01	21.00	19.45	224.60	1.50	3.37	9.75	0.37					0.29		0.47	1.13	0.00	0.00	4.49	249.50	**256.61**	249.50	249.50	248.98	0	0	**TRUE**	**FALSE**
	11833		21.00							19.45	7.25	140.96	0.82	0.29	**65**	0.47													
11833		249.50	21.00	19.45	16.62	1.50	0.25	7.25	0.20					0.06		0.04	0.30	0.00	0.00	0.55	250.05	**255.82**	251.44	250.05	251.44	0	0	**TRUE**	**FALSE**
	11802		24.00							19.45	3.30	64.14	0.17	0.06	**25**	0.04													
11802		251.44	24.00	19.45	52.75	0.74	0.39	3.30	0.04					0.45		0.65	1.15	0.00	0.00	1.53	252.97	**255.15**	252.97	252.97	251.29	252.89	0	**TRUE**	**FALSE**
	11765		18.00							10.88	5.53	60.17	0.48	0.17	**0**	0.00													
	11796		15.00							6.05	9.09	55.02	1.28	0.45	**55**	0.65													
11765		252.97	18.00	10.88	63.86	1.07	0.68	5.53	0.12					0.00		0.00	0.12	0.00	0.00	0.80	253.77	**256.02**	253.77	253.77	0	0	0	**TRUE**	**FALSE**
										10.88	0.00	0.00	0.00	0.00	**n/a**	0.00													
11806		245.01	15.00	4.56	18.40	0.49	0.09	10.85	0.46					0.00		0.00	0.46	0.59	0.00	0.69	245.70	**250.15**	245.70	245.70	0	0	0	**FALSE**	**FALSE**
										4.56	0.00	0.00	0.00	0.00	**n/a**	0.00													
11796		252.97	15.00	6.05	35.51	0.87	0.31	9.09	0.32					0.00		0.00	0.32	0.42	0.00	0.73	253.70	**254.94**	253.70	253.70	0	0	0	**FALSE**	**FALSE**
										6.05	0.00	0.00	0.00	0.00	**n/a**	0.00													
*	**HGL analysis provided for existing structure 12548**																												
*	**Tailwater Assumptions (highest WSEL controls):**																												
*	**80% full flow WSEL entering structure #12548 from structure #12490 = 227.19' + (1.25' x 0.8) =228.19'.**																												
12548																					**228.19**	**230.44**	228.19	228.19				**TRUE**	**TRUE**
12490		228.19	15.00	4.10	94.50	0.40	0.38	9.77	0.37					0.00		0.00	0.37	0.48	0.24	0.62	228.81	**233.93**	228.81	228.81	0	0	0	**FALSE**	**TRUE**
										4.10	0.00	0.00	0.00	0.00	**n/a**	0.00													
*	**HGL analysis provided for existing structure 12554**																												
*	**Tailwater Assumptions (highest WSEL controls):**																												
*	**80% full flow WSEL entering structure #12554 from structure #12494 = 224.77' + (1.25' x 0.8) =225.77'.**																												
12554																					**225.77**	230.43	225.77	225.77				**TRUE**	**TRUE**
12494		225.77	15.00	3.53	92.68	0.30	0.28	10.73	0.45					0.00		0.00	0.45	0.58	0.29	0.57	226.34	**234.16**	226.34	226.34	0	0	0	**FALSE**	**TRUE**
										3.53	0.00	0.00	0.00	0.00	**n/a**	0.00													

GENERAL ASSUMPTIONS

- * **Pipe outlet depth computed using 0.8 x the pipe diameter.**
- * **Rim elevations reflect: 1) surveyed or designed structure top for manholes and grates , 2) surveyed or designed structure top minus 9" for catch basins (per CB-2, CB-2A, DI-3B details), 3) the roadway shoulder elevation at the top of a ditch section.**
- * **Plunging losses are applied if:**
- * **1) the surface inlet inflow is 20% or more of the total flow through the junction, or**
- * **2) if a lateral conduit enters a junction with its invert elevation above the crown line elevation of the outgoing trunkline conduit, and the flow from the lateral is 20% or more of the total flow through the junction (Chapter 9, VDOT Drainage Manual).**
- * **Assume NO inlet shaping for all existing structures within the Arlington County ROW. Assume inlet shaping for all existing structures within or draining directly to the VDOT ROW.**

WATER DEPTH AT CURB AT AT-GRADE INLETS

Curb and Gutter Analysis: 12122
Notes:

Gutter Input Parameters
Longitudinal Slope of Road: 0.0120 ft/ft
Cross-Slope of Pavement: 0.0300 ft/ft
Depressed Gutter Geometry
Cross-Slope of Gutter: 0.0830 ft/ft
Manning's n: 0.0150
Gutter Width: 1.5000 ft
Design Flow: 3.2600 cfs

Gutter Result Parameters
Width of Spread: 7.8011 ft
Gutter Depression: 0.9540 in
Area of Flow: 0.9725 ft^2
Eo (Gutter Flow to Total Flow): 0.5084
Gutter Depth at Curb: 3.7624 in

Inlet Input Parameters
Inlet Location: Inlet on Grade
Inlet Type: Curb Opening
Length of Inlet: 7.5000 ft
Local Depression: 0.0000 in

Inlet Result Parameters
Intercepted Flow: 2.0125 cfs
Bypass Flow: 1.2475 cfs
Efficiency: 0.6173

Curb and Gutter Analysis: 12143
Notes:

Gutter Input Parameters
Longitudinal Slope of Road: 0.0170 ft/ft
Cross-Slope of Pavement: 0.0300 ft/ft
Depressed Gutter Geometry
Cross-Slope of Gutter: 0.0830 ft/ft
Manning's n: 0.0150
Gutter Width: 1.5000 ft
Width of Spread: 4.7530 ft

Gutter Result Parameters
Design Flow: 1.2700 cfs
Gutter Depression: 0.9540 in
Area of Flow: 0.3985 ft^2
Eo (Gutter Flow to Total Flow): 0.7427
Gutter Depth at Curb: 2.6651 in

Inlet Input Parameters
Inlet Location: Inlet on Grade
Inlet Type: Curb Opening
Length of Inlet: 7.5000 ft
Local Depression: 0.0000 in

Inlet Result Parameters
Intercepted Flow: 1.0506 cfs
Bypass Flow: 0.2194 cfs
Efficiency: 0.8273

Curb and Gutter Analysis: 11907
Notes:

Gutter Input Parameters
Longitudinal Slope of Road: 0.0080 ft/ft
Cross-Slope of Pavement: 0.0200 ft/ft
Depressed Gutter Geometry
Cross-Slope of Gutter: 0.0830 ft/ft
Manning's n: 0.0150
Gutter Width: 1.5000 ft
Width of Spread: 9.4747 ft

Gutter Result Parameters
Design Flow: 2.3500 cfs
Gutter Depression: 1.1340 in
Area of Flow: 0.9686 ft^2
Eo (Gutter Flow to Total Flow): 0.4691
Gutter Depth at Curb: 3.4079 in

Inlet Input Parameters
Inlet Location: Inlet on Grade
Inlet Type: Curb Opening
Length of Inlet: 7.5000 ft
Local Depression: 0.0000 in

Inlet Result Parameters
Intercepted Flow: 1.6580 cfs
Bypass Flow: 0.6920 cfs
Efficiency: 0.7055

Curb and Gutter Analysis: 11933
Notes:

Gutter Input Parameters
Longitudinal Slope of Road: 0.0080 ft/ft
Cross-Slope of Pavement: 0.0200 ft/ft
Depressed Gutter Geometry
Cross-Slope of Gutter: 0.0830 ft/ft
Manning's n: 0.0150
Gutter Width: 1.5000 ft
Width of Spread: 10.6342 ft

Gutter Result Parameters
Design Flow: 3.0900 cfs
Gutter Depression: 1.1340 in
Area of Flow: 1.2017 ft^2
Eo (Gutter Flow to Total Flow): 0.4200
Gutter Depth at Curb: 3.6862 in

Inlet Input Parameters
Inlet Location: Inlet on Grade
Inlet Type: Curb Opening
Length of Inlet: 7.5000 ft
Local Depression: 0.0000 in

Inlet Result Parameters
Intercepted Flow: 1.9408 cfs
Bypass Flow: 1.1492 cfs
Efficiency: 0.6281

STORMWATER & ADEQUATE OUTFALL NARRATIVE

THE SUBJECT PROJECT SITE IS LOCATED ALONG N HIGHLAND ST BETWEEN ARLINGTON BLVD (ROUTE 50) AND 1ST RD N. THE NEW SIDEWALK WILL BE ADDED ALONG THE WEST SIDE OF N HIGHLAND ST AND NEW CURB & GUTTER WILL BE ADDED ALONG THE BOTH SIDES OF N HIGHLAND ST. APPROXIMATE 90' WATERMAIN WILL BE REPLACED AT THE SOUTH END OF THE PROJECT. THE WATERSHED OF THIS PROJECT IS LOWER LONG BRANCH. THE PROPOSED PROJECT STRIVES TO HONOR THE EXISTING DRAINAGE DIVIDES EXCEPT 0.15AC DRAINAGE AREA WILL BE RE-DIVIDED TO STRUCTURE #11806 ON 1ST RD N DUE TO THE PROPOSED REVERSED ROADWAY SURFACE AT THE WEST SIDE OF N HIGHLAND ST APPROACHING 1ST RD N. THERE IS NO EXISTING STORM STRUCTURES WITHIN THE PROJECT LIMITS. THE IMPACTED EXISTING STORM STRUCTURES ARE LOCATED ON 1ST RD N, 1ST ST N, AND AT THE INTERSECTION OF N HIGHLAND ST/ARLINGTON BLVD.

THIS PROJECT IS A LINEAR PROJECT AND THE STRORMWATER OUTFALLS INTO A CLOSED PIPE SYSTEM. THE TOTAL DISTURBED AREA OF THIS PROJECT IS 35180SF. THE IMPERVIOUS AREA WILL BE INCREASED BY 1020SF DUE TO THE NEW SIDEWALK ALONG THE PROJECT. THERE IS A HIGH POINT LOCATED AT THE MID-BLOCK BETWEEN 1ST RD N AND 1ST ST N. THERE IS NO LOW POINT WITHIN THE PROJECT LIMITS.

BOTH EXISTING AND PROPOSED STORM SEWER SYSTEMS WERE ANALYZED USING THE 10-YEAR STORM EVENT AND INCLUDE HYDROLOGIC AND HYDRAULIC COMPUTATIONS. THE PROPOSED STORM SYSTEM ANALYSIS IS PRESENTED ON SHEETS C075.1 THROUGH C075.2OF THIS PLAN SET AND DESCRIBED BELOW:

THE STORMWATER ANALYSIS SHOWS THAT THE UPSTREAM PIPES BETWEEN STRUCTURES #11765 AND #11842 ARE UNDERSIZED. SINCE THIS IS AN EXISTING CONDITION THERE IS NO IMPROVEMENT CONSIDERED WITH THIS PROJECT. ACCORDING TO THE PROPOSED DESIGN, 0.15AC OF DRAINAGE WILL BE DIVERTED TO STRUCTURE #11806 ON 1ST RD N. THE SPREAD AT THIS SAG STRUCTURE WILL INCREASES A LITTLE, FROM 6.99' TO 7.60'. 1ST RD N IS A NEIGHBORHOOD MINOR STREET WHICH IS 24' WIDE WITH PARKING ON BOTH SIDES. THE 0.6' INCREASE ON SPREAD SHOULD NOT IMPACT ON VEHICLE TRAVELING ON THIS STREET. MEANWHILE, THE SPREAD AT THE SAG STRUCTURE #11796 IMPROVES A LITTLE DUE TO THE DRAINAGE AREA REDUCTION.

THE IMPACTED DOWNSTREAM STRUCTURES INCLUDE #11907, #11933, #12122, AND #12143 ON 1ST ST N. THE ANALYSIS SHOWS STRUCTURES #11907 AND #11933 HAVE SPREAD CONCERN WHICH IS MORE THAN GUTTER WIDTH PLUS HALF OF TRAVELWAY. SINCE THIS IS AN EXISTING CONDITION AND THIS PROJECT WILL NOT CHANGE THE DRAINAGE PATTERN TO THESE STRUCTURES, THERE IS NO IMPROVEMENT CONSIDERED WITH THIS PROJECT.

MEANWHILE, AFTER THE STROMWATER SYSTEM ANALYSIS, THE COUNTY STORMWATER INFRASTRUCTURE OFFICE IS CONTACTED TO CHECK IF THERE ARE ANY DRAINAGE CONCERNS AT THE VICINITY AREA OF THIS PROJECT AND THEY CONFIRM THAT THERE IS NO IMPROVEMENT NEEDED IN THIS AREA.

THE OTHER IMPACTED DOWNSTREAM STRUCTURES ARE DROP INLETS AT THE INTERSECTION OF N HIGHLAND ST/ARLINGTON BLVD, #12490 AND #12494. THESE STRUCTURES FUNCTION WELL AND DON'T SHOW ANY CONCERNS WITH THE ANALYSIS.

THE DOWNSTREAM ANALYSIS IS PERFORMED TO A POINT WHERE THE RUNOFF FROM THE PROJECT SITE MEETS A CONFLUENCE WHERE IT IS LESS THAN 1% OF THE TOTAL DRAINAGE AREA, SEE SHEET C031.2. THE ANALYSIS SHOWS THAT STORMWATER DISCHARGES INTO A CLOSED PIPE SYSTEM. THEREFORE, THERE IS NO DOWNSTREAM EROSION CONCERN.

ARLINGTON VIRGINIA

DEPARTMENT OF ENVIRONMENTAL SERVICES
FACILITIES & ENGINEERING DIVISION
ENGINEERING BUREAU
2100 CLARENDON BOULEVARD, SUITE 813
ARLINGTON, VA 22201
PHONE: 703.228.3629
FAX: 703.228.3606

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SEAL
COMMONWEALTH OF VIRGINIA
JIONG LIN
Lic. No. 0402051875
04/07/2020
PROFESSIONAL ENGINEER

APPROVALS	DATE
	4/7/2020
QUALITY CONTROL ENGINEER	
Kamal N. Taktak	4.7.20
CONSTRUCTION MANAGEMENT SUPERVISOR	
David W. Hundelt	04.14.2020
WATER, SEWER, STREETS BUREAU CHIEF	
Dennis M. Leach.	04/13/20
TRANSPORTATION DIRECTOR	
Tim McIntosh	4/16/20
PROJECT MANAGER	

REVISIONS	DATE

PROJECT NAME AND LOCATION
STORM SEWER COMPUTATIONS II
N HIGHLAND STREET
1ST ROAD N
TO ARLINGTON BOULEVARD
Z261

DESIGNED: E CACCAVARI
DRAWN: E CACCAVARI
CHECKED: J LIN
MISS UTILITY TRANSMITTAL #5330

FILENAME: Z261-250-DRAINAGE_DIVIDES.DW
PATH: Q:\DATA\Z261\DESIGN\CAD\ACTIVE
PLOTTED: JUNE 23 2020
PLOTTED BY: ECACCAVARI

SCALE
N/A

SHEET
C075.2

Revised: 01/21/2016

Revised: 01/21/2016

LANDSCAPING NOTES AND LEGEND

PROPOSED TREE PLANTINGS

(PROPOSED TREE PLANTINGS BY OTHERS)

PROPOSED TREE LOCATION

QUANTITY AND NAME OF PROPOSED TREE (SEE SHEET C092.1 FOR PLANT LIST).

1. TREES SHALL BE INSTALLED AFTER HARDSCAPE CONSTRUCTION IS COMPLETED, IN THE NEXT PLANTING SEASON.
2. CONTRACTOR TO COORDINATE SPECIES WITH THE COUNTY LANDSCAPE ARCHITECT AND COUNTY URBAN FORESTER.
3. TREES TO HAVE TREE TAGS FOR INSPECTION PRIOR TO INSTALLATION. CONTRACTOR TO CALL THE COUNTY URBAN FORESTER AT 703-228-1863, 72 HOURS BEFORE PLANTING TO SCHEDULE INSPECTION OF THE TREES TO BE PLANTED.
4. THE CONTRACTOR IS RESPONSIBLE FOR CALLING MISS UTILITY PRIOR TO THE SCHEDULED DATE FOR PLANT INSTALLATION.
5. TREES TO BE INSTALLED PER CONTRACT SPECIFICATIONS.
6. FOLLOW ADMINISTRATIVE REGULATION 4.3: TREE PLANTING ON PUBLIC PROPERTY FOR ALL TREE PLANTINGS.
7. CONTRACTOR TO PLANT THE TREES ACCORDING TO ARLINGTON COUNTY DPR DESIGN STANDARD DETAIL 329300.1 (ON FLAT LAND) OR 329300.2 (ON SLOPES).
8. BRANCHES ON PROPOSED TREES WHICH ARE LESS THAN 4' ABOVE GRADE SHALL BE TRIMMED TO MAINTAIN SIGHT DISTANCE.
9. WARRANTY FOR 1 YEAR AFTER PLANTING SHALL BE THE CONTRACTOR'S RESPONSIBILITY. THE COUNTY URBAN FORESTER AND DPR IS RESPONSIBLE FOR INSPECTION. THE COUNTY URBAN FORESTER WILL COORDINATE WITH DPR STAFF ON SCHEDULING INSPECTIONS 2 YEARS AFTER PLANTING TO ASSUME RESPONSIBILITY.
10. WATERING FOR 2 YEARS AFTER PLANTING IS TO BE INCLUDED FOR NEWLY-PLANTED TREES. DPR WILL TAKE RESPONSIBILITY OF OTHER MAINTENANCE, AND AFTER 2 YEARS, WATER AS NEEDED.

PROPOSED TREE PLANTING STRIP SOIL PANELS

PROPOSED TREE PLANTING STRIP WITH IMPORTED NEW TOPSOIL. SOIL PANEL AT EACH PROPOSED TREE LOCATION SHALL BE 5' WIDE AND 30" DEEP (SEE DETAIL ON SHEET C092.1).

1. THE CONTRACTOR IS RESPONSIBLE FOR CALLING MISS UTILITY PRIOR TO THE SCHEDULED DATE FOR SOIL PANEL INSTALLATION.
2. SOIL PANELS TO BE INSTALLED PER CONTRACT SPECIFICATIONS.
3. TREE PANELS/TREE PITS: THE CONTRACTOR IS REQUIRED TO EXCAVATE THE TREE PITS TO THE LENGTH, WIDTH AND DEPTH SPECIFIED IN THE CONSTRUCTION PLANS AND CORRESPONDING DPR PLANTING DETAILS. THE LENGTH, WIDTH AND DEPTH OF EACH INDIVIDUAL TREE PIT SHALL BE DOCUMENTED WITH A CLEARLY LABELED PHOTOGRAPH USING A RIGID TAPE MEASURE. THE PHOTOGRAPHS SHALL BE EMAILED TO THE COUNTY CONSTRUCTION MANAGER AND/OR PROJECT OFFICER FOR APPROVAL PRIOR TO THE TREE PITS BEING FILLED WITH APPROVED TOPSOIL.

PROPOSED TOPSOIL AND SOD

1. AREAS OF PROPOSED TOPSOIL AND SOD ARE SHOWN ON THE TYPICAL ROADWAY SECTIONS ON SHEET C0041.
2. AREAS OF PROPOSED SOD ARE ALSO SHOWN ON THE TREE PLANTING STRIP DETAILS (SEE SHEET C092.1).

EXISTING TREES

1. FOR THOSE EXISTING TREES TO BE PROTECTED OR REMOVED, SEE E&S PLAN ON SHEET C031.1.

THIS SHEET FOR LANDSCAPING PURPOSES ONLY

ARLINGTON VIRGINIA

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FACILITIES & ENGINEERING DIVISION
ENGINEERING BUREAU
2100 CLARENDON BOULEVARD, SUITE 813
ARLINGTON, VA 22201
PHONE: 703.228.3629
FAX: 703.228.3606

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SEAL

COMMONWEALTH OF VIRGINIA
JIONG LIN
Lic. No. 0402051875
04/07/2020
PROFESSIONAL ENGINEER

APPROVALS	DATE
	4/7/2020
QUALITY CONTROL ENGINEER Kamal N. Taktak	4.7.20
CONSTRUCTION MANAGEMENT SUPERVISOR David W. Hundelt	04.14.2020
WATER, SEWER, STREETS BUREAU CHIEF Dennis M. Leach.	04/13/20
TRANSPORTATION DIRECTOR Tim McIntosh	4/16/20
PROJECT MANAGER	

REVISIONS	DATE

PROJECT NAME AND LOCATION

LANDSCAPE PLAN

N HIGHLAND STREET
1ST ROAD N
TO ARLINGTON BOULEVARD

Z261

DESIGNED: E CACCAVARI
DRAWN: E CACCAVARI
CHECKED: J LIN
MISS UTILITY TRANSMITTAL #5330

FILENAME: Z261-260-LANDSCAPE_PLAN.DWG
PATH: Q:\DATA\Z261\DESIGN\CAD\ACTIVE
PLOTTED: JUNE 23 2020
PLOTTED BY: ECACCAVARI

SCALE

25 0 25
HORIZ: 1" = 25'

SHEET C091.1

THIS DETAIL SUPERSEDES ALL OTHER TREE STRIP PLANTING DETAILS IN ARLINGTON COUNTY.

NOTES

1. REFER TO DETAIL 329300.4B FOR ADDITIONAL CROSS SECTION AND PLAN OF TREE PLANTING STRIP DETAIL.

2. REFER TO DETAIL 329300.5 FOR GENERAL STREET TREE PLANTING NOTES.

TREE PLANTING STRIP (1 OF 2)

1/2" - 1'-0"

FOR TREE PLANTING STRIPS IN RIGHT-OF-WAY
329300.4A (2016) (02939.4A)

ARLINGTON VIRGINIA DPR

NOTES

1. AT PLANTING PRUNE ONLY CROSSING LIMBS, BROKEN OR DEAD BRANCHES, AND ANY BRANCHES THAT POSE A HAZARD TO PEDESTRIANS PER ANSI STANDARD A300. DO NOT PRUNE INTO OLD WOOD ON EVERGREENS.

2. CONTRACTOR SHALL MAXIMIZE EXCAVATED AREA FOR TREE PIT WITHOUT ADVERSELY IMPACTING ADJACENT SITE FEATURES.

3. UNLESS OTHERWISE DIRECTED BY ARLINGTON COUNTY URBAN FORESTER, BACKFILL SOIL MIXTURE WILL BE 3/4 EXISTING SOIL CLEANED OF DEBRIS (GRAVEL, ROCKS, STICKS, TRASH, ETC.) AND MIXED WITH 1/4 ORGANIC MATERIAL (COMPOSTED BARK, LEAF MOLD, OR OTHER PLANT DEBRIS PROCESSED TO A POINT OF DECAY AND APPROVED BY THE URBAN FORESTER; PEAT MOSS SHALL NOT BE USED).

4. CONTRACTOR SHALL LEGALLY REMOVE EXCESS SOIL & DEBRIS FROM SITE.

5. TREES PLANTED WITHOUT THE TRUNK FLARE VISIBLE WILL BE REJECTED.

6. TREES MAY ONLY BE STAKED IF REQUIRED BY THE COUNTY URBAN FORESTER. REFER TO STAKING DETAILS.

ALL PLANTS MUST BE WATERED TWICE: ONCE AT INSTALLATION AND AGAIN WITHIN 48-HOURS OF INSTALLATION, PER THE SPECIFICATIONS.

THIS DETAIL SUPERSEDES ALL OTHER TREE PLANTING DETAILS IN ARLINGTON COUNTY.

TREE PLANTING DETAIL

NOT TO SCALE

FOR OPEN PLANTING AREAS FREE OF PAVING OR GRATES
329300.1 (2019)

ARLINGTON VIRGINIA DPR

TREE REPLACEMENT SCHEDULE:

REQUIREMENTS PER ARLINGTON COUNTY TREE REPLACEMENT STANDARDS

TREES TO BE REMOVED < 10" DBH: 8

TREES TO BE REMOVED > 10" DBH: 2

REPLACEMENT TREES REQUIRED: 10

REPLACEMENT TREES PROVIDED: 12

A.CROSS SECTION

NOTES

1. REFER TO DETAIL 329300.4A FOR TREE STRIP PLANTING AREA INFORMATION.

2. REFER TO DETAIL 329300.5 FOR GENERAL TREE PLANTING NOTES.

PLAN

TREE PLANTING STRIP (2 OF 2)

NOT TO SCALE

FOR TREE PLANTING STRIPS IN RIGHT-OF-WAY
329300.4B (2018)

ARLINGTON VIRGINIA DPR

NOTES

1. A PERMIT IS REQUIRED WHEN TREES ARE PLANTED IN PUBLIC RIGHT-OF-WAY OR IN A PUBLIC EASEMENT. THE DEPARTMENT OF ENVIRONMENTAL SERVICES SHALL ISSUE THE PERMIT ACCORDING TO THE PROVISIONS OF THE CURRENT ARLINGTON COUNTY ADMINISTRATIVE REGULATION 4.3.

2. TREE SPECIES SHALL BE SELECTED FROM THE "ARLINGTON COUNTY STREET TREE LIST" OR PER SECTOR PLAN REQUIREMENTS.

3. TREES SHALL BE NURSERY GROWN SPECIMENS THAT MEET THE LATEST EDITION OF THE AMERICAN STANDARDS FOR NURSERY STOCK (ANSI Z60). BALLED AND BURLAPPED TREES SHALL BE SECURELY HELD IN PLACE BY UNTREATED BURLAP AND STOUT ROPE (NYLON ROPE IS NOT ACCEPTABLE). LOOSE, BROKEN OR MANUFACTURED BALLS ARE UNACCEPTABLE.

4. CALL MISS UTILITY AT (800) 552-7001 FOR UTILITY LOCATIONS PRIOR TO EXCAVATION.

5. AT TIME OF PLANTING PRUNE ONLY CROSSING LIMBS, BROKEN OR DEAD BRANCHES, AND ANY BRANCHES THAT POSE A HAZARD TO PEDESTRIANS. DO NOT PRUNE INTO OLD WOOD ON EVERGREENS.

6. TREE PIT AND TREE STRIP PLANTING AREA DIMENSIONS:
   (A) 5' X 12' OR LARGER IS STANDARD
   (B) 4' X 15' MINIMUM IS ALLOWED PER SITE CONDITIONS AND COUNTY URBAN FORESTER'S APPROVAL.

7. SPACE TREES 25'-30' APART OR PER SECTOR PLAN REQUIREMENTS OR SITE CONDITIONS.

8. SITE CHARACTERISTICS, SUCH AS OVERHEAD POWER LINES, EXISTING VEGETATION, AND INFRASTRUCTURE ITEMS SUCH AS CURBS, SIDEWALKS AND UTILITIES SHALL BE CONSIDERED. TREES THAT GROW TALLER THAN 25 FEET SHOULD NOT BE PLANTED DIRECTLY UNDER POWER LINES. WHEN POSSIBLE THE TREE LEADER SHALL BE OFFSET FROM POWER LINES.

9. BACKFILL SOIL MIXTURE SHALL BE 3/4 EXISTING SOIL CLEANED OF DEBRIS (GRAVEL, ROCKS, STICKS, TRASH, ETC.) AND MIXED WITH 1/4 ORGANIC MATERIAL(COMPOSTED BARK, LEAF MOLD, OR OTHER PLANT DEBRIS PROCESSED TO A POINT OF DECAY AND APPROVED BY THE COUNTY URBAN FORESTER. PEAT MOSS MAY NOT BE USED.

10. IF THE QUANTITY OF ACCEPTABLE EXISTING SOIL IS INSUFFICIENT FOR THE PLANTING REQUIREMENTS, THE CONTRACTOR MAY USE TOPSOIL. SOIL TEST REPORT RESULTS FOR THE TOPSOIL WILL BE MADE AVAILABLE TO THE COUNTY URBAN FORESTER UPON REQUEST. CONTRACTOR SHALL SUBMIT TOPSOIL FOR APPROVAL TO COUNTY URBAN FORESTER THAT MEETS THE FOLLOWING SPECIFICATIONS:
   (A.) TOPSOIL CONSIST'S OF A SANDY LOAM WITH UNIFORM COMPOSITION AND IS FREE OF STONES, LUMPS, PLANTS, ROOTS, AND OTHER DEBRIS OVER 1/2" IN LENGTH.
   (B.) TOPSOIL HAS A FH RANGE OF 5.5 TO 6.5 AND A MINIMUM CONTENT OF 1.0% ORGANIC MATTER
   (C.) TOPSOIL DOES NOT CONTAIN TOXIC SUBSTANCES HARMFUL TO PLANT GROWTH. SOLUBLE SALT LEVEL SHALL NOT EXCEED 3 MILLIOHMS PER CENTIMETER.

11. TREES PLANTED WITHOUT THE TRUNK FLARE VISIBLE WILL BE REJECTED.

12. TREES MAY ONLY BE STAKED IF REQUIRED BY THE COUNTY URBAN FORESTER. REFER TO ARLINGTON COUNTY STANDARD STAKING DETAILS.

13. MULCH SHALL BE CLEAN, SCREENED, DOUBLE-HAMMERED HARDWOOD BARK MULCH, UNIFORM IN SIZE AND FREE OF STONES, CLODS, NON-ORGANIC DEBRIS AND OTHER FOREIGN MATERIAL.

14. ALL PLANTS SHALL BE WATERED TWICE: ONCE AT INSTALLATION AND AGAIN WITHIN 48-HOURS OF INSTALLATION. EACH WATERING WILL CONSIST OF 20 GALLONS PER TREE.

15. CONTRACTOR SHALL LEGALLY REMOVE EXCESS SOIL & DEBRIS FROM SITE.

GENERAL NOTES FOR STREET TREE PLANTINGS

FOR TREES PLANTED IN RIGHT-OF-WAY
329300.5 (2016) (02930.5)

ARLINGTON VIRGINIA DPR

LYON PARK: N. HIGHLAND STREET PLANT LIST

Key	Quantity	Botanical Name	Common Name	Size/Cal.	Cond.	Remarks
Street Trees						
QR	3	Quercus rubra	Northern Red Oak	1 ½"-2" cal.	B&B	Straight, single trunk
Replacement Trees						
CC	1	Cercis canadensis	Redbud	8-10 ft.	B&B	Tree form. Straight trunk. #116
AH	2	Carpinus carolina	American Hornbeam	8-10 ft.	B&B	Tree form. Straight trunk. #108
BN	3	Betula nigra 'Heritage'	Heritage River Birch	8-10 ft.	B&B	Multi-trunk. 3 canes min. #108, #34 and #20
LI-P	2	Lagerstroemia indica	Dark Pink Crape Myrtle	8-10 ft.	B&B	Multi-trunk, 5 canes min. #3100 1st St. N
PY	1	Prunus x yedoensis 'Akebono'	Akebono Flowering Cherry	8-10 ft.	B&B	Single trunk-tree form. #16

NOTES:
1. All plants to have tree tags for inspection prior to installation.
2. All plants to be installed per contract specifications.
3. The contractor is responsible for calling Ms. Utility prior to the scheduled date for plant installation.
4. Locations and plant species of replacement trees will be confirmed with property owners prior to installation.

August 06, 2019, revised January 31, 2020, revised April 6, 2020

ARLINGTON VIRGINIA

DEPARTMENT OF ENVIRONMENTAL SERVICES
FACILITIES & ENGINEERING DIVISION
ENGINEERING BUREAU
2100 CLARENDON BOULEVARD, SUITE 813
ARLINGTON, VA 22201
PHONE: 703.228.3629
FAX: 703.228.3606

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SEAL

COMMONWEALTH OF VIRGINIA
JIONG LIN
Lic. No. 0402051875
04/07/2020
PROFESSIONAL ENGINEER

APPROVALS	DATE
	4/7/2020
QUALITY CONTROL ENGINEER Kamal N. Taktak	4.7.20
CONSTRUCTION MANAGEMENT SUPERVISOR David W. Hundelt	04.14.2020
WATER, SEWER, STREETS BUREAU CHIEF Dennis M. Leach.	04/13/20
TRANSPORTATION DIRECTOR Tim McIntosh	4/16/20
PROJECT MANAGER	

REVISIONS	DATE

PROJECT NAME AND LOCATION

LANDSCAPE DETAILS

N HIGHLAND STREET
1ST ROAD N
TO ARLINGTON BOULEVARD

Z261

DESIGNED: E CACCAVARI
DRAWN: E CACCAVARI
CHECKED: J LIN
MISS UTILITY TRANSMITTAL #5330

FILENAME: Z261-260-LANDSCAPE_PLAN.DWG
PATH: O:\DATA\Z261\DESIGN\CAD\ACTIVE
PLOTTED: JUNE 23 2020
PLOTTED BY: ECACCAVARI

SCALE NOT TO SCALE

SHEET C092.1

Revised: 01/21/2016

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STANDARD PAVEMENT MARKING LEGEND

Ⓐ	TYPE B CLASS 1	WHITE 4" WIDTH	PARKING LANES, EDGE LINES, LANE LINES
Ⓑ	TYPE B CLASS 1	WHITE 4" WIDTH, 10' LONG, 30' SPACING	DASHED LANE LINES
Ⓒ	TYPE B CLASS 1	WHITE 4" WIDTH, 2' LONG 10' SPACING	LANE TRANSITIONS, TURN LANE SKIPS
Ⓓ	TYPE B CLASS 1	WHITE 18" WIDTH	STOP BARS
Ⓔ	TYPE B CLASS 1	WHITE 24" WIDTH	CONTINENTAL CROSS WALKS
Ⓕ	TYPE B CLASS 1	WHITE 6" WIDTH	TURN LANES, TRANSVERSE CROSS WALKS, BIKE LANES
Ⓖ	TYPE B CLASS 1	YELLOW 4" WIDTH, 10' LONG, 30' SPACING	DIVIDED TRAFFIC, TWO WAY TURN LANES
Ⓗ	TYPE B CLASS 1	YELLOW 4" WIDTH	EDGE LINES
Ⓘ	TYPE B CLASS 1	YELLOW 4" WIDTH, DOUBLE LINE, 4" SPACING	CENTERLINES
Ⓙ	TYPE B CLASS 1	WHITE 6" WIDTH, 10' SPACING @45 DEGREE	HATCH LINES, SAFETY ZONES
Ⓚ	TYPE B CLASS 1	WHITE SINGLE ARROW	TURN LANES
Ⓛ	TYPE B CLASS 1	WHITE COMBINATION ARROW	TURN LANES
Ⓜ	TYPE B CLASS 1	WHITE 8' LETTERS	PAVEMENT LETTERS (STOP, YIELD, BUS, ONLY, etc.)
Ⓝ	TYPE B CLASS 1	WHITE 6" WIDTH, 2' LONG, 10' SPACING	LANE TRANSITIONS, TURN LANE SKIPS
Ⓞ	TYPE B CLASS 1	WHITE 12" WIDTH, 20' SPACING @45 DEGREE	GORE MARKINGS
Ⓟ	TYPE B CLASS 1	YELLOW 8" WIDTH @45 DEGREE	GORE MARKINGS
Ⓠ	TYPE B CLASS 1	WHITE 6" WIDTH, 2' LONG, 4' SPACING	LANE TRANSITIONS
Ⓡ	TYPE B CLASS 1	WHITE 4" WIDTH, DOUBLE LINE, 4' SPACING	CURB EXTENSIONS
Ⓢ	TYPE B CLASS 1	WHITE 24" WIDTH	VDOT - STOP BARS
Ⓣ	TYPE B CLASS 1	YELLOW 6" WIDTH, 2' LONG, 4' SPACING	LANE TRANSITIONS

Virginia Department of Transportation
Review of Working Drawings

Working drawings have been reviewed in accordance with Section 105.10 of the 2007 VDOT Road & Bridge Specifications with comments as follows:

☑ Review Completed
☐ Correct and Resubmit
☐ Rejected - See Remarks

Reviewed by: GS Date 2/21/2020

PAVEMENT MARKING NOTES:

1. STREET WIDTH MEASUREMENTS ARE FROM FACE OF CURB TO FACE OF CURB. LANES ARE MEASURED FROM CENTER OF MARKING TO CENTER OF MARKING .
2. CONTACT DES-TRANSPORTATION ENGINEERING & OPERATIONS CONSTRUCTION MANAGEMENT SPECIALIST OR HIS DESIGNEE AT 703-228-6598 OR 571-437-1077 TO APPROVE MARKING LAYOUT 48 HOURS PRIOR TO INSTALLATION OF MARKINGS.
3. PAVEMENT MARKINGS TO BE IN ACCORDANCE WITH THE FOLLOWING AND ANY REVISIONS HERE TO:
   A. THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.
   B. ARLINGTON COUNTY MARKING STANDARDS.
4. ALL MARKINGS SHALL BE THERMOPLASTIC PER ARLINGTON COUNTY MARKING STANDARDS.
5. STOP BARS SHALL BE A MINIMUM OF 4' IN ADVANCE OF A MARKED CROSSWALK. IF THERE IS NO MARKED CROSSWALK, STOP BAR SHALL BE NO MORE THAN 30' FROM THE NEAREST EDGE OF THE INTERSECTED TRAVELED WAY.
6. CROSSWALKS SHALL BE 10' WIDE UNLESS OTHERWISE NOTED.
7. LEFT TURN ARROWS SHALL BE LOCATED 25' BACK FROM STOP BAR. FOR ADDITIONAL ARROWS FOLLOW COUNTY MARKING STANDARDS.
8. ON-STREET PARKING LANE IS 7' WIDE (UNLESS OTHERWISE NOTED) AND MARKED WITH 4" WIDE WHITE LINES. BEGINNING AND END OF PARKING SHALL BE MARKED WITH AN END LINE PERPENDICULAR TO CURB EXCEPT AT NUBS OR WHERE OTHERWISE INDICATED.
9. SHARED LANE MARKINGS SHALL BE PLACED IN CENTER OF LANE, 250' APART UNLESS OTHERWISE SPECIFIED.
10. BIKE LANE SYMBOLS TO BE PLACED 330' APART UNLESS OTHERWISE SPECIFIED.
11. EDGE LINES ARE ONLY REQUIRED WHERE SHOWN ON THE PLANS.
12. FOR DETAILS SEE ARLINGTON COUNTY PAVEMENT MARKING SPECIFICATION, DETAILS MK-1 TO MK-12

SIGN NOTES:

1. FOR ALL SIGN POSTS PLACED IN CONCRETE USE 7 GAUGE HEAVY DUTY ANCHOR (30"X2.50") WITH HARDWARE FOR 2" POST. USE $\frac{5}{16}$" CORNER BOLT WITH FLANGED NUT AND $\frac{3}{8}$" DRIVER RIVET WITH WASHER.
2. CONTACT TE&O CONSTRUCTION MANAGER OR HIS DESIGNEE AT 703-228-6598 OR 571-437-1077 48 HRS PRIOR TO POURING CONCRETE. ALTERNATIVE CONTACT AT 703-228-3788 OR 571-414-7497.

LEGEND

EXISTING		PROPOSED
	BUS STOP	
	FIRE HYDRANT	
	PARKING METER	
	SIGN	

GRAPHIC SCALE
25 0 25
SCALE: 1" = 25'

Revised: 01/21/2016

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ARLINGTON VIRGINIA
DEPARTMENT OF ENVIRONMENTAL SERVICES
FACILITIES & ENGINEERING DIVISION
ENGINEERING BUREAU
2100 CLARENDON BOULEVARD, SUITE 813
ARLINGTON, VA 22201
PHONE: 703.228.3629
FAX: 703.228.3606

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SEAL
COMMONWEALTH OF VIRGINIA
JIONG LIN
Lic. No. 0402061875
07/27/2020
PROFESSIONAL ENGINEER

APPROVALS	DATE
QUALITY CONTROL ENGINEER	7/28/2020
CONSTRUCTION MANAGEMENT SUPERVISOR	7.27.20
WATER, SEWER, STREETS BUREAU CHIEF	07.27.2020
TRANSPORTATION DIRECTOR	7/27/20
PROJECT MANAGER	

REVISIONS	DATE

PROJECT NAME AND LOCATION
SIGNAGE AND MARKING PLAN
N HIGHLAND STREET
1ST ROAD N
TO ARLINGTON BOULEVARD
Z261

DESIGNED: E CACCAVARI
DRAWN: E CACCAVARI
CHECKED: J LIN
MISS UTILITY TRANSMITTAL #5330

FILENAME: Z261-280-SIGNAGE_AND_STRIPING.DWG
PATH: O:\DATA\Z261\DESIGN\CAD\ACTIVE
PLOTTED: SEPTEMBER 14 2020
PLOTTED BY: ECACCAVARI

SCALE 1"=25'

SHEET C101.1

LEGEND:

- ARROW PANEL
- ARROW PANEL ON TRAILER
- AREA UNDER CONSTRUCTION
- AREA CONSTRUCTED IN PREVIOUS PHASE
- SUB-PHASE OF AREA UNDER CONSTRUCTION
- TRAFFIC FLOW
- TRAFFIC DRUM
- ARROW PANEL ON TRAILER
- SIGN
- TYPE III BARRICADE
- FLAGGER

TRAFFIC DRUM
N.T.S.

WORK HOURS:

1. IN ARLINGTON RIGHT-OF-WAY - 9 AM TO 4 PM (MON.-FRI.)
2. IN VDOT RIGHT-OF-WAY - 9:30 AM TO 3 PM (MON.-THUR.) AND 9:30 AM TO 2 PM (FRI.)
3. ALL LANES SHALL BE FULLY OPEN TO TRAFFIC OUTSIDE THE ABOVE HOURS UNLESS SPECIFIED OTHERWISE IN THE MAINTENANCE OF TRAFFIC PLANS.

ADDITIONAL NOTES:

1. SPACING OF ADVANCE WARNING SIGNS SHALL BE MINIMUM 100FT FOR POSTED SPEED LIMIT OF 25 MPH.
2. THE MINIMUM LANE WIDTH SHALL BE 10'. THIS APPLIES TO BOTH DURING CONSTRUCTION WORK HOURS, AND WHEN THE ROADWAY IS OPENED UP TO NORMAL TRAFFIC FLOW FOR ALL PHASES OF CONSTRUCTION.
3. MODIFICATIONS TO THE MAINTENANCE OF TRAFFIC PLAN OR CONSTRUCTION PHASING MAY BE MADE AT THE CONTRACTOR'S REQUEST WITH APPROVAL FROM THE COUNTY PROJECTS OFFICER, OR AT THE DIRECTION OF THE COUNTY PROJECT OFFICER.
4. CONTRACTORS SHALL COVER ANY EXISTING SIGNS WHICH ARE NOT APPLICABLE OR ARE IN CONFLICT WITH THIS MOT PLAN.
5. TEMPORARY SIGNS AND BARRIERS SHOULD NOT BE PLACED WHERE THEY WILL OBSTRUCT PASSAGE ON SIDEWALKS, UNLESS SUCH SIGNS OR BARRIERS ARE INTENDEDTO CLOSE THAT SECTION OF SIDEWALK.

ZONE TABLE

ZONE #	TTC# VEHICULAR	TTC# PEDESTRIAN	COMMENTS	MAXIMUM DURATION	WORK HOURS
			N HIGHLAND ST		
ZONE A	TTC - 34.2		• WATERMAIN IMPROVEMENT CONSTRUCTION • SOUTHBOUND TRAVEL LANE WILL BE CLOSED DURING CONSTRUCTION. NORTHBOUND TRAVEL LANE WILL BE OPEN TO NORMAL TRAFFIC. • CONTRACTOR SHALL MAINTAIN ARLINGTON BLVD TRAIL ACCESSIBILITY AT ALL TIMES (TEMPORARY SIDEWALK AND CURB RAMP SHALL BE USED AS NEEDED) • SEE SHEET C121.2 FOR DETOUR PLAN	ONE TO TWO WEEKS	
ZONE B	TTC - 23.2 TTC - 28.2		• STREET IMPROVEMENT CONSTRUCTION FROM ARLINGTON BLVD. TO 1ST ST. N.	ONE TO THREE WEEKS	
ZONE C	TTC - 23.2 TTC - 28.2		• STREET IMPROVEMENT CONSTRUCTION AT 1ST ST. N. TO 1ST RD. N.	ONE TO THREE WEEKS	
ZONE D	TTC - 23.2 TTC - 28.2		• STREET IMPROVEMENT CONSTRUCTION AT 1ST RD N TO 1ST ST. N.	ONE TO THREE WEEKS	
ZONE E	TTC - 23.2 TTC - 28.2		• STREET IMPROVEMENT CONSTRUCTION AT 1ST ST. N TO N HIGHLAND ST	ONE TO THREE WEEKS	
ZONE F	TTC - 36.2		• CONTRACTOR SHALL MAINTAIN ARLINGTON BLVD TRAIL ACCESSIBILITY AT ALL TIMES (TEMPORARY SIDEWALK AND CURB RAMP SHALL BE USED AS NEEDED)	LESS THAN ONE WEEK	

NOTE: THE DURATIONS SHOWN WERE DEVELOPED FOR PLANNING AND ESTIMATION PURPOSES ONLY. THE DURATIONS IN NO WAY ALTER THE CONTRACT TIME FOR COMPLETION, OR INFRINGE ON THE CONTRACTORS MEANS AND METHODS. THE CONTRACTOR'S SUBMITTED SCHEDULE SUPERSEDES THE ESTIMATED DURATIONS SHOWN.

ADDITIONAL NOTE:
ZONE C SHALL NOT BE CONSTRUCTED UNTIL ZONE D HAS BEEN CONSTRUCTED.

Revised: 01/21/2016

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ARLINGTON VIRGINIA
DEPARTMENT OF ENVIRONMENTAL SERVICES
FACILITIES & ENGINEERING DIVISION
ENGINEERING BUREAU
2100 CLARENDON BOULEVARD, SUITE 813
ARLINGTON, VA 22201
PHONE: 703.228.3629
FAX: 703.228.3606

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SEAL
COMMONWEALTH OF VIRGINIA
JIONG LIN
Lic. No. 0402051875
04/07/2020
PROFESSIONAL ENGINEER

APPROVALS	DATE
	4/7/2020
QUALITY CONTROL ENGINEER Kamal N. Taktak	4.7.20
CONSTRUCTION MANAGEMENT SUPERVISOR David W. Hundelt	04.14.2020
WATER, SEWER, STREETS BUREAU CHIEF Dennis M. Leach.	04/13/20
TRANSPORTATION DIRECTOR Tim McAntosh	4/16/20
PROJECT MANAGER	

REVISIONS	DATE

PROJECT NAME AND LOCATION
MAINTENANCE OF TRAFFIC PLAN
N HIGHLAND STREET
1ST ROAD N
TO ARLINGTON BOULEVARD
Z261

DESIGNED: E CACCAVARI
DRAWN: E CACCAVARI
CHECKED: J LIN
MISS UTILITY TRANSMITTAL #5330

FILENAME: Z261-286-MOT.DWG
PATH: Q:\DATA\Z261\DESIGN\CAD\ACTIVE
PLOTTED: JUNE 23 2020
PLOTTED BY: ECACCAVARI

SCALE
GRAPHIC SCALE
30 0 30
SCALE: 1" = 30'

SHEET C121.1

4. CONTRACTORS SHALL COVER ANY EXISTING SIGNS WHICH ARE NOT APPLICABLE OR ARE IN CONFLICT

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DEPARTMENT OF
ENVIRONMENTAL SERVICES

FACILITIES & ENGINEERING DIVISION
ENGINEERING BUREAU
2100 CLARENDON BOULEVARD, SUITE 813
ARLINGTON, VA 22201
PHONE: 703.228.3629
FAX: 703.228.3606

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SEAL

COMMONWEALTH OF VIRGINIA
JIONG LIN
Lic. No. 0402051875
04/07/2020
PROFESSIONAL ENGINEER

APPROVALS	DATE
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CONSTRUCTION MANAGEMENT SUPERVISOR David W. Hundelt	04.14.2020
WATER, SEWER, STREETS BUREAU CHIEF Dennis M. Leach.	04/13/20
TRANSPORTATION DIRECTOR Tim McAntosh	4/16/20
PROJECT MANAGER	

REVISIONS	DATE

PROJECT NAME AND LOCATION

DETOUR PLAN

N HIGHLAND STREET
1ST ROAD N
TO ARLINGTON BOULEVARD

Z261

DESIGNED: E CACCAVARI
DRAWN: E CACCAVARI
CHECKED: J LIN
MISS UTILITY TRANSMITTAL #5330

FILENAME: Z261-286-MOT.DWG
PATH: Q:\DATA\Z261\DESIGN\CAD\ACTIVE
PLOTTED: JUNE 23 2020
PLOTTED BY: ECACCAVARI

SCALE

GRAPHIC SCALE
50 0 50
SCALE: 1" = 50'

SHEET C121.2

Revised: 01/21/2016

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CONSTRUCTION NOTES

1. FOR ALL ARTERIAL STREETS, PORTABLE VARIABLE MESSAGE SIGNS WITH CLOSURE INFORMATION MUST BE INSTALLED AHEAD OF THE PROJECT SITE AT EACH VEHICULAR APPROACH 3 WEEKS PRIOR TO STREET CLOSURE IN LOCATIONS DIRECTED BY THE PROJECT OFFICER.
2. CONTRACTOR SHALL REMOVE EXISTING PAVEMENT MARKINGS IN CONFLICT WITH TEMPORARY PAVEMENT MARKINGS.
3. CONTACT TRANSPORTATION ENGINEERING OPERATIONS AT 703-228-6598 OR 571-437-1077 AND THE PROJECT OFFICER TO APPROVE MARKING LAYOUT 48 HOURS PRIOR TO INSTALLATION OF MARKINGS.
4. ONE LANE CLOSURE IN EACH DIRECTION OF TRAFFIC WILL BE PERMITTED FOR FINAL PAVEMENT OVERLAY.
5. DURING CONSTRUCTION, THE CONTRACTOR SHALL MAINTAIN THE FLOW OF TRAFFIC ON ANY INTERSECTION WITHIN THE WORK AREA.
6. THE CONTRACTOR SHALL NOTIFY ARLINGTON COUNTY PUBLIC SCHOOLS TWO WEEKS PRIOR TO STARTING CONSTRUCTION.
7. THE CONTRACTOR SHALL SUBMIT ANY REQUESTS FOR TEMPORARY "NO PARKING" RESTRICTIONS TO THE PROJECT OFFICER AT LEAST 3 WORKING DAYS PRIOR TO THE DESIRED ONSET OF RESTRICTIONS. PRIOR TO A REQUEST FOR THE REMOVAL OF ACCESS TO ANY ADA PARKING SPACE THE CONTRACTOR MUST HAVE MADE PROVISION FOR ALTERNATIVE ADA PARKING AS INDICATED ON THE APPROVED PLAN OR AS DIRECTED BY THE PROJECT OFFICER
8. WHEN THE APPROVED PLAN CALLS FOR THE REMOVAL OF ANY PARKING METER THE CONTRACTOR MUST MAKE A REQUEST TO THE PROJECT OFFICER AT LEAST ONE WEEK IN ADVANCE OF THE DESIRED REMOVAL. THE PROJECT OFFICER WILL THEN COORDINATE THE PARKING METER REMOVAL WITH TRAFFIC ENGINEERING AND OPERATIONS.

MOT NOTES:

1. PARKING SHALL BE RESTRICTED BY THE COUNTY AS PART OF THE RIGHT OF WAY PERMIT. CONTACT DES-PERMITTING SECTION, 703-228-4798, AT LEAST 72 HOURS PRIOR TO COMMENCEMENT OF WORK.
2. ALL TEMPORARY BUS TRAVEL LANES MUST BE MINIMUM 11' WIDE.
3. THE CONTRACTOR SHALL MAINTAIN ADA ACCESSIBLE PARKING SPACES AT ALL TIMES DURING CONSTRUCTION. THE CONTRACTOR SHALL CONTACT DES - PERMITING, 703-228-4798, TO COORDINATE RELOCATION OF EXISTING ADA ACCESSIBLE PARKING SPACES OR TO INSTALL TEMPORARY SIGNAGE OUT OF AND ADJACENT TO THE WORK ZONE AS CONSTRUCTION PROGRESSES. MULTIPLE RELOCATIONS MAY BE NECESSARY DURING EACH PHASE.

PEDESTRIAN NOTE:

1. PEDESTRIANS SHALL BE APPROPRIATELY DIRECTED WITH ADVANCED WARNING SIGNS PLACED AT INTERSECTIONS, TO CROSS TO THE OPPOSITE SIDE OF THE ROADWAY IN ORDER TO PREVENT CONFLICT WITH MIDBLOCK WORK SITES.

Typical Traffic Control
Lane Closure on a Two-Lane Roadway Using Flaggers
(Figure TTC-23.2)

NOTES

Guidance:

1. *Sign spacing distance should be 350'-500' where the posted speed limit is 45 mph or less, and 500'-800' where the posted speed limit is greater than 45 mph.*
2. *Care should be exercised when establishing the limits of the work zone to insure maximum possible sight distance in advance of the flagger station and transition, based on the posted speed limit and at least equal to or greater than the values in Table 6H-3. Generally speaking, motorists should have a clear line of sight from the graphic flagger symbol sign to the flagger.*
3. *To maintain efficient traffic flow in a flagging operation on a two-lane roadway, the maximum time motorists should be stopped at a flagger station is 8 minutes for high volume roadways (average daily traffic of 500 or more vehicles per day) to a maximum of 12 minutes for low volume roadways (less than 500 vehicles per day). For additional information see Section 6E.07.*[2]

Standard:

4. **Portable Temporary Rumle Strips (PTRS) shall be used as noted in Section 6F.99.**
5. **Flagging stations shall be located far enough in advance of the work space to permit approaching traffic to reduce speed and/or stop before passing the work space and allow sufficient distance for departing traffic in the left lane to return to the right lane before reaching opposing traffic (see Table 6H-3 on Page 6H-5).**
6. **All flaggers shall be state certified and have their certification card in their possession when performing flagging duties (see Section 6E.01, Qualifications for Flaggers).**
7. **Cone spacing shall be based on the posted speed and the values in Table 6H-4 on Page 6H-6.**[1]
8. **A shadow vehicle with at least one high intensity amber rotating, flashing, or**[1] **oscillating light shall be parked 80'-120' in advance of the first work crew.**

Option:

8. A SLOW (W21-V10) sign[2] may be required in this area to give advance warning of the operation ahead by slowing approaching traffic prior to reaching the flagger station or queued traffic.

Guidance:

9. *If the queue of traffic reaches the BE PREPARED TO STOP (W3-4) sign then the signs, and if used the* PTRS[1] *should be readjusted at greater distances.*
10. *When a highway-rail crossing exists within or upstream of the transition area and it is anticipated that queues resulting from the lane closure might extend through the highway-rail grade crossing, the temporary traffic control zone should be extended so that the transition area precedes the highway-rail crossing (see Figure TTC-56 for additional information on highway-rail crossings).*

Standard:

11. **At night, flagger stations shall be illuminated, except in emergencies (see Section 6E.08).**

Option:

12. Cones may be eliminated when using a pilot vehicle operation or when the total roadway width is 20 feet or less.
13. For low-volume situations with short work zones on straight roadways where the flagger is visible to road users approaching from both directions, a single flagger, positioned to be visible to road users approaching from both directions, may be used (see Chapter 6E).

Standard:[1]

14. **When used**[2]**, three portable temporary rumble (PTRS) strips shall be installed across the entire travel lane adjacent to the BE PREPARED TO STOP (W3-4) sign. The portable temporary rumble strips shall be monitored and adjusted as necessary during the work shift to ensure proper placement on the roadway. When the PTRS are installed, the RUMBLE STRIPS AHEAD (W20-V26) sign shall also be utilized.**

1: Revision 1 – 4/1/2015
2: Revision 2 – 9/1/2019

Table 6H-2, Taper Length (L)

Posted Speed Limit (mph)	Width of Offset (Feet)				Remarks
	9	10	11	12	
≤ 25	95	105	115	125	L= S²W/60
30	135	150	165	180	"
35	185	205	225	245	"
40	240	270	295	320	"
45	405	450	495	540	L=SW
50	450	500	550	600	"
55	495	550	605	660	"
60	540	600	660	720	"
65	585	650	715	780	"
70	630	700	770	840	"
Limited Access Highway merging taper length (L) shall be 1000 feet regardless of the posted speed. SW=L is desired for the shifting taper length with ½L being the minimum.					

Table 6H-3, Length of the Longitudinal Buffer Space[1]

Posted Speed Limit (mph)	Distance (Feet)
≤ 20	115 – 120
25	155 – 165[1]
30	200 – 210
35	250 – 260
40	305 – 325[1]
45	360 – 380
50	425 – 445
55	500 – 530[1]
60	570 – 600[1]
65	645 – 675
70	730 – 760

1: Revision 1 – 4/1/2015

Table 6H-4, Channelizing Device Spacing

Location	Posted Speed Limit (mph)	
	0 - 35	36 +
Transition Spacing	20'	40'
Travelway Spacing	40'	80'
Spot Construction Access *	80'	120'

* For easier access by construction vehicles into the work area, spacing of devices may be increased to this distance, but shall not exceed one access per 0.25 mile unless approved by the engineer and documented.

Table 6H-5, Recommended Spacing of Advance Warning Signs[1]

Road Type	Spacing (Feet)
Urban street with 25 mph or less posted speed	100 – 200
Urban street with 30 to 40 mph posted speed	250 – 350
*** All Other Roadways with 45 mph or less posted speed**	350 – 500
All Other Roadways with greater than 45 mph posted speed	500 – 800
Limited Access highways	1300 – 1500

* Urban streets with greater than 40 mph posted speed limits fall into this category.

Note: For urban conditions, it is generally better to place all advanced warning signs within a one block area versus spreading out the signs over several blocks, however, motorist must have time to recognize and react to each warning sign see Section 6G.11.

Lane Closure on a Two-Lane Roadway Using Flaggers
(Figure TTC-23.2)

1: Revision 1 – 4/1/2015
2: Revision 2 – 9/1/2019

Revised: 01/21/2016

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ARLINGTON
VIRGINIA

DEPARTMENT OF ENVIRONMENTAL SERVICES
FACILITIES & ENGINEERING DIVISION
ENGINEERING BUREAU
2100 CLARENDON BOULEVARD, SUITE 813
ARLINGTON, VA 22201
PHONE: 703.228.3629
FAX: 703.228.3606

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SEAL
COMMONWEALTH OF VIRGINIA
JIONG LIN
Lic. No. 0402051875
04/07/2020
PROFESSIONAL ENGINEER

APPROVALS	DATE
	4/7/2020
QUALITY CONTROL ENGINEER Kamal N. Taktak	4.7.20
CONSTRUCTION MANAGEMENT SUPERVISOR David W. Hundelt	04.14.2020
WATER, SEWER, STREETS BUREAU CHIEF Dennis M. Leach.	04/13/20
TRANSPORTATION DIRECTOR Tim McAntosh	4/16/20
PROJECT MANAGER	

REVISIONS	DATE

PROJECT NAME AND LOCATION
MAINTENANCE OF TRAFFIC PLAN NOTES AND DETAILS I

N HIGHLAND STREET
1ST ROAD N
TO ARLINGTON BOULEVARD
Z261

DESIGNED: E CACCAVARI
DRAWN: E CACCAVARI
CHECKED: J LIN
MISS UTILITY TRANSMITTAL #5330

FILENAME: Z261-286-MOT.DWG
PATH: Q:\DATA\Z261\DESIGN\CAD\ACTIVE
PLOTTED: JUNE 23 2020
PLOTTED BY: ECACCAVARI

SCALE
NOT TO SCALE

SHEET C122.1

Typical Traffic Control
Lane Closure Operation in an Intersection
(Figure TTC-28.2)
NOTES

Guidance:

1. *The control of traffic through the intersection in order of preference should be:*
   a. *Obtain the services of law enforcement personnel.*
   b. *Detour the effective routes to other roads and streets as approved and directed by the District[1] Traffic Engineer.*
   c. *Place a state certified flagger on each leg of the intersection controlling a single lane of traffic.*

   Appropriate signing as shown should be used for law enforcement and flagging operations. For detour signs see Figure TTC-34.
2. *Sign spacing distance should be 350'-500' where the posted speed limit is 45 mph or less, 500'-800' where the posted speed limit is greater than 45 mph.*
3. *To maintain efficient traffic flow in a flagging operation on a two-lane roadway the maximum time motorist should be stopped at a flagger station is 8 minutes for high volume roadways (average daily traffic of 500 or more vehicles per day) to a maximum of 12 minutes for low volume roadways (less than 500 vehicles per day). For additional information see Section 6E.07.[2]*

Standard:

4. **Channelizing device spacing shall be on 20' centers or less.**
5. **PTRS shall be used as noted in Section 6F.99.**

Guidance:

6. *If room permits, a shadow vehicle with at least one rotating amber light or high intensity amber flashing or oscilllating[1] light should be parked 80'-120' in advance of the first work crew.*

Standard:

7. **For emergency situations (any non-planned operation) of 30 minutes or less duration, two rotating amber lights or high intensity amber flashing or oscillating[1] lights mounted on the vehicle and visible for 360° shall be required in addition to the channelizing devices shown around the vehicle. Also, vehicle hazard warning signals shall be used.**

Guidance:

8. *If the work space extends across a crosswalk, the crosswalk should be closed using the information and devices shown in Figure TTC-36.*

Support:

9. Turns can be prohibited as required by vehicular traffic conditions. Unless the streets are wide, it might be physically impossible to make certain turns, especially for large vehicles.

1: Revision 1 – 4/1/2015
2: Revision 2 – 9/1/2019

Lane Closure Operation in an Intersection
(Figure TTC-28.2)

2: Revision 2 – 9/1/2019

Typical Traffic Control
Street Closure Operation with Detour
(Figure TTC-34.2)
NOTES

Guidance:

1. *This plan should be used for streets without posted route numbers.*
2. *On multi-lane streets, Detour signs with an Advance Turn Arrow should be used in advance of a turn.*
3. *Sign spacing distance should be 225'-275' where the posted speed limit is 30 to 35 mph, and 100'-200' where the posted speed is 25 mph or less.*
4. *If the road is opened for a significant distance beyond the intersection and/or there are significant origin/destination points beyond the intersection, the ROAD CLOSED (R11-2) and Detour Arrow (M4-10) signs on Type 3 Barricades should be located at the corners of intersecting closed roadway or the traveled way.*
5. *In urban areas, signs on an eight foot Type 3 barricade, should not cover more than half of the top two rails. On a four foot Type 3 barricade, a sign should not cover more than the top rail. When used alone on a four foot Type 3 barricade, the ROAD CLOSED (R11-1) sign or the ROAD CLOSED TO THRU TRAFFIC (R11-4) sign should be installed above the Type 3 barricade.[2]*

Option:

6. Flashing warning lights and/or flags may be used to call attention to the advance warning signs.
7. Flashing warning lights may be used on Type 3 Barricades.
8. Detour signs may be located on the far side of intersections. A Detour sign with an advance arrow may be used in advance of a turn.
9. A Street Name (M4-VP1a) plaque may be mounted with the Detour sign. The Street Name plaque may be either white on green or black on orange.

Standard:

10. **When used, the Street Name plaque shall be placed above the Detour sign.**

Support:

11. See Chapter 6I for additional information on incident management traffic control.

2: Revision 2 – 9/1/2019

Street Closure Operation with Detour
(Figure TTC-34.2)

1: Revision 1 – 4/1/2015
2: Revision 2 – 9/1/2019

Typical Traffic Control
Crosswalk Closure and Pedestrian Detour Operation
(Figure TTC-36.2)
NOTES

Standard:

1. **When crosswalks or other pedestrian facilities are closed or relocated, temporary facilities shall be detectable and shall include accessibility features consistent with the features present in the existing pedestrian facility.**
2. **Curb parking shall be prohibited for at least 50 feet in advance of the midblock crosswalk.**

Guidance:

3. *Audible information devices should be considered where midblock closings and changed crosswalk areas cause inadequate communication to be provided to pedestrians who have visual disabilities.*
4. *Pedestrian traffic signal displays controlling closed crosswalks should be covered or deactivated.*
5. *Temporary markings should be considered for operations exceeding three days in duration.*

Option:

6. Only the TTC devices related to pedestrians are shown. Other devices, such as lane closure signing or ROAD NARROWS (W5-1) signs, may be used to control vehicular traffic.
7. For nighttime closures, Type A Flashing warning lights may be used on barricades supporting signs and closing sidewalks.

Standard:

8. **In order to maintain the systematic use of the fluorescent yellow-green background for school warning signs in a jurisdiction, the fluorescent yellow-green background for school warning signs shall be used in TTC zones.[2]**
9. **All sidewalk closures shall be closed with Type 3 Barricades. The SIDEWALK CLOSED (R9-9) sign and the SIDEWALK CROSS HERE (R9-11) sign shall be installed above the Type 3 Barricade. The KEEP RIGHT sign can cover the top rail of the Type 3 Barricade.[2]**

Support:

10. Refer to Sections 3B-16 through 3B-18 of the 2009 MUTCD and the Virginia Supplement to the MUTCD[1] for crosswalk[1] lines, yield lines and other related TTC devices that may be used to control vehicular traffic at midblock crosswalks.

Standard:[2]

11. **The YIELD HERE TO PEDESTRIANS (R1-5) sign shall be placed at the Yield Line.**
12. **Fluorescent yellow-green PEDESTRIAN TRAFFIC (W11-2) symbol sign, AHEAD (W16-9p) plaque and ARROW (W16-7p) plaque shall be used to identify the work zone crosswalk.**

1: Revision 1 – 4/1/2015
2: Revision 2 – 9/1/2019

Crosswalk Closure and Pedestrian Detour Operation
(Figure TTC-36.2)

1: Revision 1 – 4/1/2015
2: Revision 2 – 7/1/2018

Revised: 01/21/2016

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ARLINGTON VIRGINIA

DEPARTMENT OF ENVIRONMENTAL SERVICES

FACILITIES & ENGINEERING DIVISION
ENGINEERING BUREAU
2100 CLARENDON BOULEVARD, SUITE 813
ARLINGTON, VA 22201
PHONE: 703.228.3629
FAX: 703.228.3606

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COMMONWEALTH OF VIRGINIA
JIONG LIN
Lic. No. 0402051875
04/07/2020
PROFESSIONAL ENGINEER

APPROVALS	DATE
	4/7/2020
QUALITY CONTROL ENGINEER Kamal N. Taktak	4.7.20
CONSTRUCTION MANAGEMENT SUPERVISOR David W. Hundelt	04.14.2020
WATER, SEWER, STREETS BUREAU CHIEF Dennis M. Leach.	04/13/20
TRANSPORTATION DIRECTOR Tim McAntosh	4/16/20
PROJECT MANAGER	

REVISIONS	DATE

PROJECT NAME AND LOCATION
MAINTENANCE OF TRAFFIC PLAN
NOTES AND DETAILS II

N HIGHLAND STREET
1ST ROAD N
TO ARLINGTON BOULEVARD
Z261

DESIGNED: E CACCAVARI
DRAWN: E CACCAVARI
CHECKED: J LIN
MISS UTILITY TRANSMITTAL #5330

FILENAME: Z261-286-MOT.DWG
PATH: Q:\DATA\Z261\DESIGN\CAD\ACTIVE
PLOTTED: JUNE 23 2020
PLOTTED BY: ECACCAVARI

SCALE
NOT TO SCALE

SHEET C122.2

TRANSPORATION MANAGEMENT PLAN / SEQUENCE OF CONSTRUCTION GENERAL NOTES

Temporary Traffic Control Plan

General Notes:

1. TMP/SOC Type A Project Information:

a. Identify the project's TMP/SOC Type:
This project's TMP/SOC plan has been designed in conformance with a Type A TMP /SOC plan.

b. Identify the work zone location, length, and widths:
The project location is as shown on Sheet C000.1.
The work zone areas have been delineated as shown on the TMP /SOC and MOT Plan Sheets.
The work zone lengths and widths vary by location as shown on the TMP /SOC and MOT Plan Sheets.

c. Note the hours the Construction Area will be active:
Construction Area shall be considered active when any impact to traffic occurs. (1st Cone in Road)
Construction Area hours have the following limitations:

LANE CLOSURES (URBAN PRINCIPAL ARTERIAL SYSTEM + URBAN LOCAL STREET)			
	MONDAY TO THURSDAY	FRIDAY	SATURDAY + SUNDAY
DAY TIME in VDOT right-of-way	9:30 AM to 3:00 PM	9:30 AM to 2:00 PM	*Not Allowed
DAY TIME in Arlington County right-of-way	9:00 AM to 4:00 PM	9:00 AM to 4:00 PM	*Not Allowed
NIGHT TIME	*Not Allowed	*Not Allowed	*Not Allowed

* Night time and weekend work shall not be allowed unless approved by the Engineer.

No lane closures will be allowed from 12:00pm on the day before a holiday until 12:00pm in VDOT right-of-way on the workday following the holiday. No lane closures will be allowed from 3:00pm on the day before a holiday until 3:00pm in Arlington County right-of-way on the workday following the holiday. Holidays include all State and Federal holidays.

Designation of Peak Hour Times:
Peak hours are 6:00AM through 9:00AM & 3:30PM through 6:30PM.

d. The TMP /SOC plan, during construction, shall be in accordance with Sections 512, 701, 703 & 704 of the Virginia Department of Transportation Road and Bridge Specifications, dated 2016; the Virginia Work Area Protection Manual dated September 2019; the Manual on Uniform Traffic Control Devices (MUTCD), dated 2009; the Virginia Supplement to the Manual on Uniform Traffic Control Devices, dated 2011; and IIM-LD-241.5 of the Instructional and Informational Memoranda.

e. Note any existing entrances, existing intersections, or existing pedestrian access points that will be affected by the Construction Area or by the traffic control devices:

Existing Entrance along the Arlington Blvd Rt50:
N Highland St entrance,
within the construction limits. Access this entrance shall be maintained for the duration of construction.

Existing Intersection:
N Highland St along the Arlington Blvd Rt 50 with in limits of the project.

Existing Pedestrian Access Points:
N Highland St along the Arlington Blvd Rt 50 within limits of the project. Contractor shall follow VWAPM and MUTCD standards for pedestrian access points.

Existing Bus Stops:
There are no bus stops located within the project limits.

f. Identify the major types of travelers:
The traffic on the roadway consists primarily of light trucks and passenger vehicles. The surrounding areas are commercial and residential. Non-vehicular traffic includes pedestrians and bicyclists on the sidewalks, trails, and crossings.

g. The Contractor shall:

Designate a person assigned to the project who will have the primary responsibility, with sufficient authority, for Implementing the TMP /SOC and other safety and mobility aspects of the permit work. This person shall coordinate with the Arlington County Construction Inspector for the duration of construction.

Ensure that personnel assigned to the project are trained in traffic control to a level commensurate with their responsibilities in accordance with VDOT"s work zone traffic control training guidelines.

Inform the Engineer of any work requiring lane shifts, lane closures, and/or phase changes a minimum of two working days prior to implementing this activity.

Perform reviews of the Construction Area to ensure compliance with contract documents at regularly scheduled intervals at the direction of the Engineer. Contractor shall maintain an approved copy of the temporary traffic control plan at the work site at all times.

Coordinate with Arlington County Police Department and Arlington County Fire/Rescue Department for any lane closures and any detours of any nature.

Schedule all phases of construction in such a manner that water, sanitary sewer, cable, fiber cable/optic cable, any overhanging utilities, and any underground utilities services will not be interrupted.

2. This TMP /SOC plan is intended as a guide. It is not to enumerate every detail which must be considered in the construction of each phase, but only to show the general handling of existing traffic. If the Contractor is to deviate from the approved TMP, a new or revised TMP must be submitted to the Engineer for review and approval.

3. Contractor shall not close any lane of traffic on the Arlington Blvd during construction of this project. For street Intersections, commercial connections, or private entrances, a minimum width no less than existing width shall be maintained at all times, unless approved by the Engineer.

4. All areas excavated below the existing pavement surface and within the clear zone at the conclusion of each workday, shall be backfilled to form an approximate 6:1 wedge against the existing pavement or newly constructed pavement surface for the safety and protection of vehicular traffic.

5. Unsuitable material shall be disposed of offsite and are not to be used for any part of construction. Existing surface, aggregate base, and subbase material which will be demolished or obliterated during construction, and which are suitable for maintenance of traffic, should be utilized prior to the use of commercial material.

6. Each phase of construction shall be completed to the installation of intermediate course asphalt prior to the start of the next phase unless otherwise directed by the Engineer.

7. Contractor shall ensure positive drainage for the duration of the project. Contractor shall add any additional temporary measures necessary to facilitate proper, positive drainage for the duration of construction.

8. Unless specified on the plans, all existing turn lanes shall be maintained at all times for the duration of construction.

9. Where Group 2 Channelizing Devices are used to separate the Construction Area and traffic, a minimum clear zone area as defined in the VWAPM is to be maintained.

10. The Contractor is to coordinate with Arlington County for location(s) of the construction staging area. Contractor is responsible for obtaining all permits and/or easements as necessary.

11. IMPLEMENTING THE TRANSPORTATION MANAGEMENT PLAN
During the first day of the new work zone traffic pattern, the project's Manager and project's Construction Inspector shall inspect the work zone to ensure compliance with the TMP. On the third to fifth day of implementation of the TMP's new work zone traffic pattern, the Construction Inspector shall conduct an on-site review of the work zone's performance In coordination with VDOT and recommend to the Contractor any required changes to the TMP to enhance the work zone's safety and mobility. All such changes shall be documented. An on-site review of the project's work zone traffic control by the County's Construction Inspector and the Contractor shall be conducted (with coordination from VDOT) within 48 hours of any fatal incident/crash within the work zone.

12. EVALUATION OF THE TRANSPORTATION MANAGEMENT PLAN
A performance assessment of the TMP including area-wide impacts on adjacent roadways shall be performed by Arlington County with coordination from the Engineer during construction. As circumstances dictate, a review of the overall effectiveness of the project s TMP shall be completed during the Post Construction Meeting and included with the Post Construction Report. A copy of the specific information on the effectiveness of the TMP will be forwarded to Arlington County for review. A copy of the TMP Interim/post Construction Report Form can be obtained from Arlington County.

13. PUBLIC COMMUNICATIONS PLAN
The Contractor shall be responsible for:

a. Notifying the Project Manager and Construction Inspector two weeks in advance of any scheduled work plans and traffic delays.

b. Notifying the Project Manager, Construction Inspector, and corresponding Engineer of any unscheduled traffic delays.

14. TRANSPORTATION OPERATIONS
The Contractor shall be responsible for implementing and providing the following:

a. Notify the Regional Transportation Operations Center (TOC) one week in advance in order to place lane closure information on the 511 System and VA-traffic.

b. Post a list of local emergency response agencies inside the project's construction office/trailer.

c. Immediately report any traffic incidents that may occur in the work zone.

d. Notify the project's Construction Inspector and corresponding Engineer of any incidents and expected traffic delays.

e. Within 24 hours of any incidents within the construction work zone, a review of the traffic controls shall be completed and necessary adjustments made to reduce the frequency and severity of any future incidents.

CONTACT NUMBERS

County Project Manager	**Laura Simpson (703)-228-3813 (office)**
County Construction Manager	**Nick Taktak (703)-228-7527 (office)**
County Construction Inspector	**Not Applicable**
Emergency Call	**911**
Non-Emergency Numbers:	
Arlington County Police	**(703) 558- 2222**
Arlington County Fire & Rescue	**(703) 558- 2222**

GENERAL SEQUENCE OF CONSTRUCTION

General phasing Notes

1. VWAPM = VDOT's current edition of the Virginia Work Area Protection Manual.

2. The Contractor shall submit a temporary traffic control plan that prescribes the necessary traffic control measures for the work to be performed to be approved by the Engineer prior to the commencement of any work activities.

3. Prior to the start of construction, the Contractor shall install project limit signage in accordance with VWAPM **TTC-34.2, TTC-36.2**. For the duration of construction, the Contractor shall ensure this signage remains in compliance if the project limits change.

4. The Contractor is responsible for ensuring proper drainage for the duration of all phases and installing any necessary measures to facilitate proper drainage.

5. The Contractor shall retain pedestrian access to the bus stops located within the construction zone for the duration of the project.

6. The Contractor is to make any necessary adjustments during both work and non-work hours to ensure the protection and safety of the adjacent property owners, pedestrians, vehicular traffic, and the general public from any construction-related activity, construction equipment, and the construction site itself.

Construction Notes

1. The Contractor shall implement **TTC-23.2, TTC-28.2, TTC-34.2, TTC-36.2. as shown on the MOT sheet for all construction including asphalt trail, concrete sidewalk, curb ramps, retaining wall, and drainage items using** VDOT's current edition of the Virginia Work Area Protection Manual.

2. The Contractor shall remove all traffic control devices upon completion of the project.

Pavement Marking General Notes (During Construction)

1. All construction pavement markings shall be in accordance with the most current edition of each of the following and any revision thereof:
   A. Manual on Uniform Traffic Control Devices (MUTCD). 2009
   B. The Virginia Supplement to the Manual on Uniform Traffic Control Devices, 2011
   C. The Virginia Department of Transportation Road and Bridge Specifications, 2016
   D. The Virginia Department of Transportation Road and Bridge Standards, 2016

2. Any pavement markings that will conflict with the proposed or existing pavement markings shall be completely eradicated.

3. Limits of proposed pavement markings and snow plowable raised markers are approximate and shall be modified in the field to ensure that proposed pavement markings and snow plowable raised markers continue until existing pavement markings can be matched.

4. Elongated arrows shall be in accordance with MUTCD and VDOT Road and Bridge Specifications.

5. Raised markers (if any) shall be placed in accordance with Standard PM-8 and PM-9 of the VDOT Road and Bridge Standards and MUTCD.

6. All construction pavement markings shall be of Type D, Class I or II, unless otherwise directed by the VDOT Engineer. During construction any pavement markings which will conflict with those shown on the TMP /SOC plans, or as directed by the Engineer shall be covered with Type E, non-reflective black tape (or eradicated at the direction of the Engineer).

VDOT OPERATIONS

1. VDOT OPERATIONS REQUIRES NOTIFICATION WHEN TRAFFIC CONTROL IMPACTS THE TRAVELWAY. CONTRACTOR SHALL CONTACT CARLENE MCWHIRT FOR ADDITIONAL INFORMATION OF LCAM REQUIREMENTS. THE CONTACT NUMBER IS 571-350-2078.

NOTE:
THIS VERIFICATION OF COMPLETION OF ADVANCED WORK ZONE TRAFFIC CONTROL TRAINING BY EDWARD CACCAVARI IS PROVIDED FOR PLAN REVIEW PURPOSES ONLY. CONTRACTOR SHALL PROVIDE VERIFICATION OF COMPLETION OF ADVANCED WORK ZONE TRAFFIC CONTROL TRAINING PRIOR TO CONSTRUCTION NULLIFYING THIS VERIFICATION.

Virginia Department of Transportation
REVIEW OF WORKING DRAWINGS
Working drawings have been reviewed in accordance with Section 105.10 2016 VDOT Road & Bridge Specifications
✓ REVIEW COMPLETED
___ CORRECT & RESUBMIT
___ REJECTED - SEE REMARKS
Reviewed by: ____ Date: 3-17-2020

Commonwealth of Virginia
Virginia Department of Transportation
VDOT
VERIFICATION OF COMPLETION OF ADVANCED WORK ZONE TRAFFIC CONTROL TRAINING AND FLAGGER CERTIFICATION
This is to verify that Edward Caccavari has successfully completed training and an examination by the Department on the proper practices and methods for the installation, maintenance, removal of temporary traffic control devices and flagging operations.
Date: 8/2/2019
State Traffic Engineer
Verification No. 08021910 2
Expiration Date: 8/31/2023

RECEIVED
FEB 13 2020
TRANSPORTATION

ARLINGTON
VIRGINIA

DEPARTMENT OF ENVIRONMENTAL SERVICES
FACILITIES & ENGINEERING DIVISION
ENGINEERING BUREAU
2100 CLARENDON BOULEVARD, SUITE 813
ARLINGTON, VA 22201
PHONE: 703.228.3629
FAX: 703.228.3606

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COMMONWEALTH OF VIRGINIA
JIONG LIN
Lic. No. 0402061875
04/07/2020
PROFESSIONAL ENGINEER

APPROVALS	DATE
	4/7/2020
QUALITY CONTROL ENGINEER Kamal N. Taktak	4.7.20
CONSTRUCTION MANAGEMENT SUPERVISOR David W. Hundelt	04.14.2020
WATER, SEWER, STREETS BUREAU CHIEF Dennis M. Leach.	04/13/20
TRANSPORTATION DIRECTOR Tim McIntosh	4/16/20
PROJECT MANAGER	

REVISIONS	DATE

PROJECT NAME AND LOCATION
TRANSPORTATION MANAGEMENT PLAN
N HIGHLAND STREET
1ST ROAD N
TO ARLINGTON BOULEVARD
Z261

DESIGNED: E CACCAVARI
DRAWN: E CACCAVARI
CHECKED: J LIN
MISS UTILITY TRANSMITTAL #5330

FILENAME: Z261-286-TMP.DWG
PATH: Q:\DATA\Z261\DESIGN\CAD\ACTIVE
PLOTTED: JUNE 23 2020
PLOTTED BY: ECACCAVARI

SCALE

SHEET C122.3

Revised: 01/21/2016

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EXISTING CONDITION

POSTED SPEED

>> N Highland Street: 25 MPH

DESIGN SPEED= 25 MPH
SIGHT DISTANCE= 280'

Reference: VDOT Road Design Manual. Appendix F; Table 2-5

LEGEND

PROPOSED TREE LOCATION

HORIZONTAL SIGHT DISTANCE

VERTICAL SIGHT DISTANCE

ARLINGTON VIRGINIA

DEPARTMENT OF ENVIRONMENTAL SERVICES

FACILITIES & ENGINEERING DIVISION
ENGINEERING BUREAU
2100 CLARENDON BOULEVARD, SUITE 813
ARLINGTON, VA 22201
PHONE: 703.228.3629
FAX: 703.228.3606

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JIONG LIN
Lic. No. 0402051875
04/07/2020
PROFESSIONAL ENGINEER

APPROVALS	DATE
QUALITY CONTROL ENGINEER Kamal N. Taktak	4.7.20
CONSTRUCTION MANAGEMENT SUPERVISOR David W. Hundelt	04.14.2020
WATER, SEWER, STREETS BUREAU CHIEF Dennis M. Leach.	04/13/20
TRANSPORTATION DIRECTOR Tim McAntosh	4/16/20
PROJECT MANAGER	

REVISIONS	DATE

PROJECT NAME AND LOCATION

SITE DISTANCE EXHIBIT I

N HIGHLAND STREET
1ST ROAD N
TO ARLINGTON BOULEVARD

Z261

DESIGNED: E CACCAVARI
DRAWN: E CACCAVARI
CHECKED: J LIN
MISS UTILITY TRANSMITTAL #5330

FILENAME: Z261-236-SIGHT_DISTANCE.DWG
PATH: Q:\DATA\Z261\DESIGN\CAD\ACTIVE
PLOTTED: JUNE 23 2020
PLOTTED BY: ECACCAVARI

SCALE

GRAPHIC SCALE

25 0 25

SCALE: 1" = 25'

SHEET C201.1

Revised: 01/21/2016

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EXISTING CONDITION

POSTED SPEED

>> N Highland Street: 25 MPH

DESIGN SPEED= 25 MPH
SIGHT DISTANCE= 280'
Reference: VDOT Road Design Manual. Appendix F; Table 2-5

LEGEND

PROPOSED TREE LOCATION

HORIZONTAL SIGHT DISTANCE

VERTICAL SIGHT DISTANCE

ARLINGTON VIRGINIA

DEPARTMENT OF ENVIRONMENTAL SERVICES
FACILITIES & ENGINEERING DIVISION
ENGINEERING BUREAU
2100 CLARENDON BOULEVARD, SUITE 813
ARLINGTON, VA 22201
PHONE: 703.228.3629
FAX: 703.228.3606

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JIONG LIN
Lic. No. 0402051875
04/07/2020
PROFESSIONAL ENGINEER

APPROVALS	DATE
	4/7/2020
QUALITY CONTROL ENGINEER Kamal N. Taktak	4.7.20
CONSTRUCTION MANAGEMENT SUPERVISOR David W. Hundelt	04.14.2020
WATER, SEWER, STREETS BUREAU CHIEF Dennis M. Leach.	04/13/20
TRANSPORTATION DIRECTOR Tim McIntosh	4/16/20
PROJECT MANAGER	

REVISIONS	DATE

PROJECT NAME AND LOCATION

SITE DISTANCE EXHIBIT II

N HIGHLAND STREET
1ST ROAD N
TO ARLINGTON BOULEVARD

Z261

DESIGNED: E CACCAVARI
DRAWN: E CACCAVARI
CHECKED: J LIN
MISS UTILITY TRANSMITTAL #5330

FILENAME: Z261-236-SIGHT_DISTANCE.DWG
PATH: Q:\DATA\Z261\DESIGN\CAD\ACTIVE
PLOTTED: JUNE 23 2020
PLOTTED BY: ECACCAVARI

SCALE

GRAPHIC SCALE

25 0 25

SCALE: 1" = 25'

SHEET C201.2

Revised: 01/21/2016

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EXISTING CONDITION

POSTED SPEED

>> N Highland Street: 25 MPH

DESIGN SPEED= 25 MPH
SIGHT DISTANCE= 280'

Reference: VDOT Road Design Manual. Appendix F; Table 2-5

LEGEND

PROPOSED TREE LOCATION

HORIZONTAL SIGHT DISTANCE

VERTICAL SIGHT DISTANCE

ARLINGTON VIRGINIA

DEPARTMENT OF ENVIRONMENTAL SERVICES
FACILITIES & ENGINEERING DIVISION
ENGINEERING BUREAU
2100 CLARENDON BOULEVARD, SUITE 813
ARLINGTON, VA 22201
PHONE: 703.228.3629
FAX: 703.228.3606

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JIONG LIN
Lic. No. 0402051875
04/07/2020
PROFESSIONAL ENGINEER

APPROVALS	DATE
QUALITY CONTROL ENGINEER Kamal N. Taktak	4/7/2020 4.7.20
CONSTRUCTION MANAGEMENT SUPERVISOR David W. Hundelt	04.14.2020
WATER, SEWER, STREETS BUREAU CHIEF Dennis M. Leach.	04/13/20
TRANSPORTATION DIRECTOR Tim McAntosh	4/16/20
PROJECT MANAGER	

REVISIONS	DATE

PROJECT NAME AND LOCATION

SITE DISTANCE EXHIBIT III

N HIGHLAND STREET
1ST ROAD N
TO ARLINGTON BOULEVARD

Z261

DESIGNED: E CACCAVARI
DRAWN: E CACCAVARI
CHECKED: J LIN
MISS UTILITY TRANSMITTAL #5330

FILENAME: Z261-236-SIGHT_DISTANCE.DWG
PATH: O:\DATA\Z261\DESIGN\CAD\ACTIVE
PLOTTED: JUNE 23 2020
PLOTTED BY: ECACCAVARI

SCALE

GRAPHIC SCALE

25 0 25

SCALE: 1" = 25'

SHEET C201.3

Revised: 01/21/2016

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EXISTING CONDITION

POSTED SPEED

>> N Highland Street: 25 MPH

DESIGN SPEED= 25 MPH
RIGHT TURN SIGHT DISTANCE= 280'

Reference: VDOT Road Design Manual. Appendix F; Table 2-5

LEGEND

PROPOSED TREE LOCATION

HORIZONTAL SIGHT DISTANCE

VERTICAL SIGHT DISTANCE

ARLINGTON
VIRGINIA

DEPARTMENT OF ENVIRONMENTAL SERVICES
FACILITIES & ENGINEERING DIVISION
ENGINEERING BUREAU
2100 CLARENDON BOULEVARD, SUITE 813
ARLINGTON, VA 22201
PHONE: 703.228.3629
FAX: 703.228.3606

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JIONG LIN
Lic. No. 0402051875
04/07/2020
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QUALITY CONTROL ENGINEER Kamal N. Taktak	4.7.20
CONSTRUCTION MANAGEMENT SUPERVISOR David W. Hundelt	04.14.2020
WATER, SEWER, STREETS BUREAU CHIEF Dennis M. Leach.	04/13/20
TRANSPORTATION DIRECTOR Tim McAntosh	4/16/20
PROJECT MANAGER	

REVISIONS	DATE

PROJECT NAME AND LOCATION

SITE DISTANCE EXHIBIT III

N HIGHLAND STREET
1ST ROAD N
TO ARLINGTON BOULEVARD

Z261

DESIGNED: E CACCAVARI
DRAWN: E CACCAVARI
CHECKED: J LIN
MISS UTILITY TRANSMITTAL #5330

FILENAME: Z261-236-SIGHT_DISTANCE.DWG
PATH: O:\DATA\Z261\DESIGN\CAD\ACTIVE
PLOTTED: JUNE 23 2020
PLOTTED BY: ECACCAVARI

SCALE

GRAPHIC SCALE

25 0 25

SCALE: 1" = 25'

SHEET C201.4

Revised: 01/21/2016

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ARLINGTON COUNTY, VA
REQUEST FOR INFORMATION FORM

PROJECT:

RFI NUMBER: _____
PROJECT NO.:

FOR CONTRACTOR ROUTING:
Contractor: _____ Transmittal No.: _____
Work Category: Date:

TO ☐ **(County Project Officer)** ☐ Action ☐ Faxed to _____ ☐ Emailed ☐ Mailed Pages ___
☐ **(Consultant)** ☐ Action ☐ Faxed to _____ ☐ Emailed ☐ Mailed Pages ___
☐ **(Other)** ☐ Action ☐ Faxed to _____ ☐ Emailed Pages ___

REGARDING: _____
SPEC. SECTION: _____ **DWG. NO.:** _____

EXPLANATION OF ISSUE: (Provide complete description of request with sketches or photos if necessary, and present status of work)

RECOMMENDATION / SUGGESTED SOLUTION:

RESPONSE PRIORITY: ☐ EARLIEST CONVENIENCE ☐ RUSH (WORK IN PROGRESS)
REASON FOR REQUEST: ☐ Existing Condition ☐ Non-conformance ☐ Clarification / Interpretation ☐ Agency Generated ☐ Other

CONTRACTOR
: _____
BY: _____ **DATE**: _____ Dist: _____

ARCHITECT'S/ENGINEER'S ROUTING: (for A/E use only)
To: _____ Date: _____ Return to: _____ Date _____

TO: **(contractor)** ☐ Faxed to _____ ☐ Emailed ☐ Mailed ☐ Hand delivered

RESPONSE:

☐ The above is considered a change. The following document will be used for processing: _____
☐ The above is consistent with the intent of and reasonably inferable from Contract Documents, or makes minor changes in the Work without change in Contract Sum or Contract Time. If Contractor does not agree, submit written notice within twenty (20) days substantiating claim in accordance with Contract Documents for approval.
☐ This RFI is returned without response for the following reason: ☐ Incomplete or lack of detailed information. ☐ Related to "means & methods". ☐ Lack of adequate Coordination Drawings. ☐ Is a "Substitution Request". ☐ Response required by others.

FROM: _____
BY: _____ **DATE:** _____ Dist: ☐ _____ ☐ File

Posted: 03/01/2018

COMMONWEALTH of VIRGINIA

DEPARTMENT OF TRANSPORTATION
4975 Alliance Drive
Fairfax, VA 22030

CHARLES A. KILPATRICK, P.E.
COMMISSIONER

September 29, 2016

MEMORANDUM

TO: NOVA District Staff

FROM: Hari Sripathi, P.E.
Regional Operations Director

SUBJECT: Lane Closures in Nova District

As a follow up to the Lane Closures in Nova District memorandum dated April 27, 2012, enclosed are the updated guidelines for lane closures.

These updated guidelines will be effective immediately. All existing and previously approved projects are encouraged to review their respective contract documents and make adjustments if possible.

Lane Closure Guidelines

-For Northern Virginia-

Virginia Department of Transportation
Northern Region Operations

September 21, 2016

Instruction

The purpose of this memorandum is to present guidelines for lane closure hours for construction, maintenance, permits, and special events in Northern Virginia.

The first version of the lane closure guidelines was issued in April 2012. In the past four years, there have been completed and on-going roadway construction projects in the NoVA District, such as I-495 and I-95 express lanes and the I-66 spot improvements. As these guidelines are applied and implemented, modifications and updates to these guidelines have become necessary. Same as the previous version, the modifications were made based on traffic volume; roadway characteristics; comments from staff; and considering the public tolerance for the lane closure during certain time periods of the day.

It should be noted that these guidelines must be used as a starting point for discussion at the project level. On large scale projects with robust community outreach and a Traffic Management Plan, these hours could be extended. If project staff would like to modify these hours for interstate or major arterials, they must work with NRO Traffic Operations staff for recommendations and obtain final approval from their functional Assistant District Administrator (ADA).

Please review the existing contracts and discuss the deviations from these hours with your functional ADA.

Restriction of Operations:

In addition to the allowable lane closure hours specified in the tables, the restrictions listed below shall be followed.

1. **Peak Hours Lane Closures**
   Any lane reductions (temporary or permanent) during the peak periods (Monday to Friday, 6:00AM to 9:00AM and 3:30PM to 6:30PM) on roads with an AADT above or equal to 10,000 vehicles requires consultation with the Regional Operations Director (ROD) and Public Affairs Manager.

2. **Complete Roadway Closures**

   If there are complete road closures on any road for construction or maintenance work, the ROD and Public Affairs Manager must be consulted.

   Complete Roadway Closures shall be limited to 20 to 30 minutes intermittent stoppage for some specific work activities.

   If the closure duration is above 30 minutes, it shall be approved separately with full Maintenance of Traffic and Traffic Management Plans.

3. **Construction in Residential Subdivisions**

   Road work within residential subdivisions and/or cul-de-sac streets should be conducted during daytime hours to avoid night time noise issues.

4. **Express Lanes (I-95 & I-495)**

   All I-95 and I-495 Express Lane closures shall be coordinated with the Express Lanes Operations Center at least 5 business days in advance using their Authorization to Work form (available from the Express Lanes Operations Center at (571) 419-6046. Complete road closures on the I-95 Express Lanes and I-495 Express Lanes will be limited to 30 minutes or less

5. **Holiday**

   In addition to the Sunday or Holiday work limitations, mobile, short duration, short-term stationary or intermediate-term stationary temporary traffic control zone lane closures on mainline lanes, shoulders or ramps shall not be performed during the following Holiday time periods without the written permission of the Engineer. Additionally, long-term stationary temporary traffic control zones shall not be initially put in place, adjusted, or removed during the following Holiday time periods without the written permission of the Engineer (VDOT 2016 Standard Specifications, updated 7/2016):

- **January 1:** From Noon on the preceding day until Noon on the following day, except as indicated below.
- **Martin Luther King, Jr. Day and Lee Jackson Day*:** From Noon on the preceding Thursday to Noon on the following Tuesday.
- **Presidents Day*:** As indicated below.
- **Easter*:** As indicated below.
- **Memorial Day:** As indicated below.
- **July 4:** From Noon on the preceding day until Noon on the following day, except as indicated below.
- **Labor Day:** As indicated below.
- **Columbus Day*:** As indicated below.
- **Veterans Day*:** From Noon on the preceding day until Noon on the following day, except as indicated below.
- **Thanksgiving Day:** From Noon on the Wednesday proceeding Thanksgiving Day until Noon on the Monday following Thanksgiving Day.
- **Christmas Day:** From Noon on the preceding day until Noon on the following day, except as indicated below.

If the Holiday occurs on a Friday or Saturday: From Noon on the preceding Thursday to Noon on the following Monday.
If the Holiday occurs on a Sunday or Monday: From Noon on the preceding Friday to Noon on the following Tuesday.

***Note:**

For low volume roadways (minor arterial), lane closures will not be allowed during the holidays; however, there will be no restriction to the preceding day and the following day.

INTERSTATE 395 & INTERSTATE 95

WEEKDAY		Northbound			
		Single-Lane Closures or Shoulder	Two-Lane Closures	Multiple-Lane Closures	Complete Road Closure
Segment 1	14th St. Bridge to Springfield Interchange	10:00AM to 3:00PM 9:00PM to 5:00AM	10:00PM to 5:00AM	11:00PM to 5:00AM	12:00AM to 4:00AM
Segment 2	Springfield Interchange to Rt.123	9:30AM to 3:30PM 9:00PM to 5:00AM	10:00PM to 5:00AM	11:00PM to 5:00AM	12:00AM to 4:00AM
Segment 3	Rt.123 to Prince William / Stafford County line	9:30AM to 3:30PM 9:00PM to 5:00AM	10:00PM to 4:30AM	11:00PM to 4:00AM	12:00AM to 4:00AM
Segment 4	Prince William / Stafford County line to Rt.3 Exit 130	9:30AM to 3:30PM 9:00PM to 4:30AM	10:00PM to 4:30AM	n/a	12:00AM to 4:00AM
Segment 5	Rt.3 Exit 130 to Caroline / Hanover County line	9:00AM to 3:30PM 9:00PM to 5:30AM	10:00PM to 4:30AM	n/a	12:00AM to 4:00AM
All lanes open at 12:00 noon on Friday					

WEEKDAY		Southbound			
		Single-Lane Closures or Shoulder	Two-Lane Closures	Multiple-Lane Closures	Complete Road Closure
Segment 1	14th St. Bridge to Springfield Interchange	10:00AM to 2:30PM 9:30PM to 5:00AM	10:00PM to 5:00AM	11:00PM to 5:00AM	12:00AM to 4:00AM
Segment 2	Springfield Interchange to Rt.123	9:00AM to 2:00PM 9:30PM to 5:00AM	10:00PM to 5:00AM	11:00PM to 5:00AM	12:00AM to 4:00AM
Segment 3	Rt.123 to Prince William / Stafford County line	9:00AM to 2:00PM 9:30PM to 6:00AM	10:00PM to 5:00AM	11:00PM to 5:00AM	12:00AM to 4:00AM
Segment 4	Prince William / Stafford County line to Rt.3 Exit 130	9:00AM to 2:00PM 9:30PM to 6:00AM	10:00PM to 5:30AM	n/a	12:00AM to 4:00AM
Segment 5	Rt.3 Exit 130 to Caroline / Hanover County line	9:00AM to 3:00PM 9:30PM to 6:00AM	10:00PM to 5:30AM	n/a	12:00AM to 4:00AM
All lanes open at 11:00am on Friday					

INTERSTATE 395 & INTERSTATE 95			
WEEKEND	**Northbound/Southbound***		
	Single-Lane Closures or Shoulder	**Multiple-Lane Closures**	**Complete Road Closure**
Friday to Saturday	10:00PM to 7:00AM	11:00PM to 6:00AM	12:00AM to 5:00AM
Saturday to Sunday	10:00PM to 7:00AM	11:00PM to 6:00AM	12:00AM to 5:00AM
Sunday to Monday	10:00PM to 5:00AM	11:00PM to 4:00AM	12:00AM to 4:00AM

* For special operations, depending on time of year, additional hours may be allowed with proper ADA/ROD approval.

	REVERSIBLE LANES (HOV & EXPRESS LANES)*	
	Single-Lane Closures or Shoulder	**Complete Road Closure****
WEEKDAY	9:30PM (Sunday to Thursday) to 4:00AM (Monday to Friday)	11:00PM to 4:00AM
WEEKEND	11:00PM (Friday to Saturday) to 9:00AM (Saturday to Sunday)	11:00PM to 4:00AM

* Direction of traffic control for all lane closures in reversible lanes will need to be adjusted as necessary to face direction of traffic.

** Complete Road Closure on Express Lanes limited to 30 minutes or less.

INTERSTATE 495 (BELTWAY)

WEEKDAY		Inner Loop			
		Single-Lane Closures or Shoulder	Two-Lane Closures	Multiple-Lane Closures	Complete Road Closure
Segment 1	A. L. Bridge to Springfield Interchange	10:00AM to 3:00PM 9:30PM to 5:00AM	10:00PM to 5:00AM	11:00PM to 5:00AM	12:00AM to 5:00AM
Segment 2	Springfield Interchange to W.W. Bridge	10:00AM to 3:00PM 9:30PM to 5:00AM	10:00PM to 5:00AM	11:00PM to 5:00AM	12:00AM to 5:00AM
All lanes open at 12:00 noon on Friday					
WEEKDAY		Outer Loop			
		Single-Lane Closures or Shoulder	Two-Lane Closures	Multiple-Lane Closures	Complete Road Closure
Segment 1	A. L. Bridge to Springfield Interchange	9:30AM to 2:30PM 9:30PM to 5:00AM	10:00PM to 5:00AM	11:00PM to 5:00AM	12:00AM to 5:00AM
Segment 2	Springfield Interchange to W.W. Bridge	10:00AM to 3:00PM 9:30PM to 5:00AM	10:00PM to 5:00AM	11:00PM to 5:00AM	12:00AM to 5:00AM
All lanes open at 12:00 noon on Friday					

WEEKEND	Inner/Outer Loop		
	Single-Lane Closures or Shoulder	Multiple-Lane Closures	Complete Road Closure
Friday to Saturday	10:00PM to 8:00AM	11:00PM to 7:00AM	12:00AM to 5:00AM
Saturday to Sunday	10:00PM to 9:00AM	11:00PM to 8:00AM	12:00AM to 5:00AM
Sunday to Monday	9:30PM to 5:00AM	11:00PM to 5:00AM	12:00AM to 5:00AM

	EXPRESS LANES	
	Single-Lane Closures or Shoulder	Complete Road Closure**
WEEKDAY	9:30PM (Sunday to Thursday) to 4:00AM (Monday to Friday)	11:00PM to 4:00AM
WEEKEND	11:00PM (Friday to Saturday) to 9:00AM (Saturday to Sunday)	11:00PM to 4:00AM

** Complete Road Closure on Express Lanes limited to 30 minutes or less.

INTERSTATE 66

WEEKDAY		Eastbound			
		Single-Lane Closures or Shoulder	Two-Lane Closures	Multiple-Lane Closures	Complete Road Closure
Segment 1	Prince William County line to Route 286	10:00AM to 3:30PM 8:00PM to 5:00AM	9:00PM to 5:00AM	10:00PM to 5:00AM	12:00AM to 4:00AM
Segment 2	Route 286 to Beltway	11:00AM to 3:30PM 9:00PM to 5:00AM	10:00PM to 5:00AM**	11:00PM to 5:00AM**	12:00AM to 4:00AM
Segment 3	Beltway to TR Bridge (Inside Beltway)	9:30PM to 5:00AM	n/a	n/a	12:00AM to 4:00AM
All lanes open at 12:00 noon on Friday					
WEEKDAY		Westbound			
		Single-Lane Closures or Shoulder	Two-Lane Closures	Multiple-Lane Closures	Complete Road Closure
Segment 1	Prince William County line to Route 286	9:00AM to 2:30PM 9:00PM to 6:00AM	9:30PM to 6:00AM	10:30PM to 5:00AM	12:00AM to 4:00AM
Segment 2	Route 286 to Beltway	9:00AM to 2:00PM* 9:30PM to 5:00AM	10:00PM to 5:00AM**	11:00PM to 5:00AM**	12:00AM to 4:00AM
Segment 3	Beltway to TR Bridge (Inside Beltway)	9:30AM to 2:00PM* 10:00PM to 5:00AM	10:00PM to 5:00AM**	n/a	12:00AM to 4:00AM
All lanes open at 12:00 noon on Friday					

**** Only be considered for three lane segment.***
*** Consider opening shoulder lane, where Applicable.*

WEEKEND	Eastbound/Westbound		
Outside Beltway	**Single-Lane Closures or Shoulder**	**Multiple-Lane Closures**	**Complete Road Closure**
Friday to Saturday	9:00PM to 9:00AM	10:00PM to 6:00AM	12:00AM to 5:00AM
Saturday to Sunday	9:00PM to 9:00AM	10:00PM to 6:00AM	12:00AM to 5:00AM
Sunday to Monday	8:00PM to 5:00AM	9:00PM to 5:00AM	12:00AM to 4:00AM
Inside Beltway	**Single-Lane Closures or Shoulder**	**Multiple-Lane Closures**	**Complete Road Closure**
Friday to Saturday	10:00PM to 6:00AM	n/a	12:00AM to 5:00AM
Saturday to Sunday	10:00PM to 6:00AM	n/a	12:00AM to 5:00AM
Sunday to Monday	9:30PM to 5:00AM	n/a	12:00AM to 4:00AM

ROUTE 267 CONNECTOR				
WEEKDAY	**Eastbound**		**Westbound**	
	Single-Lane Closures or Shoulder	**Complete Road Closure**	**Single-Lane Closures or Shoulder**	**Complete Road Closure**
Monday to Friday	11:00AM to 3:00PM	12:00AM to 4:00AM	9:30AM to 3:00PM	12:00AM to 4:00AM
	9:30PM to 5:00AM		9:00PM to 5:00AM	
All lanes open at 12:00 noon on Friday				

WEEKEND	**Eastbound/Westbound**	
	Single-Lane Closures or Shoulder	**Complete Road Closure**
Friday to Saturday	10:00PM to 8:00AM	12:00AM to 5:00AM
Saturday to Sunday	11:00PM to 8:00AM	12:00AM to 5:00AM
Sunday to Monday	9:00PM to 5:00AM	12:00AM to 4:00AM

Single-Lane Closures* or Shoulder					
ARTERIAL	**WEEKDAY**		**WEEKEND**		
	Monday to Thursday	Friday	Friday to Saturday	Saturday to Sunday	Sunday to Monday
Major Arterials**	9:30AM to 3:00PM 10:00PM to 5:00AM	9:30AM to 2:00 PM	10:00PM to 9:00AM	10:00PM to 8:00AM	10:00PM to 5:00AM
All Other Roadways	9:00AM to 3:30PM 9:00PM to 5:00AM	9:00AM to 2:00 PM	10:00PM to 9:00AM	9:00PM to 9:00AM	10:00PM to 5:00AM

Multiple-Lane Closures					
ARTERIAL	**WEEKDAY**		**WEEKEND**		
	Monday to Thursday	Friday	Friday to Saturday	Saturday to Sunday	Sunday to Monday
Major Arterials**	10:00PM to 5:00AM	Not allowed until 11:00PM	11:00PM to 5:00AM	11:00PM to 6:00AM	11:00PM to 5:00AM
All Other Roadways	9:00PM to 5:00AM	Not allowed until 10:00PM	10:00PM to 6:00AM	10:00PM to 6:00AM	10:00PM to 5:00AM

**Single-lane closures only permitted for multiple-lane roadways.*
***Major Arterials defined as Primary Roads, high volume Secondary Roads, and all other routes that connect directly to Interstates.*

State & Federal Roads in Arlington County, VA

State Routes

- Interstate 66: Custis Memorial Parkway
- Interstate 395: Henry G. Shirley Memorial Highway
- U.S. Route 1: Jefferson Davis Highway
- State Route 27: Washington Boulevard (Memorial Bridge to U.S. Route 50)
- U.S. Route 29: Lee Highway
- U.S. Route 50: Arlington Boulevard
- State Route 110: Jefferson Davis Highway (Rosslyn to Crystal City)
- State Route 120: Glebe Road
- State Route 123: Chain Bridge Road
- State Route 124: Spout Run Parkway (Lee Highway to Lorcom Lane)
- State Route 233: Airport Viaduct
- State Route 237: Washington Boulevard (North Glebe Road to Lee Highway)
- State Route 237: Fairfax Drive (Kirkwood Road to North Glebe Road)
- State Route 237: 10th Street North (U.S. Route 50 to Kirkwood Road)
- State Route 309: Old Dominion Drive

Federal Routes

- Arlington Hall Street
- Boundary Channel Drive
- George Washington Memorial Parkway
- Fort Myer streets, including Arlington National Cemetery
- Marshall Drive (North Meade Street to U.S. Route 110)
- Memorial Avenue
- Pentagon Street
- Spout Run Parkway (Lorcom Lane to George Washington Memorial Parkway)

Arlington County, Virginia
MASTER TRANSPORTATION PLAN

Adopted December 18, 2007

Updated December 2017

ARLINGTON
VIRGINIA

Complete Streets

The street is where every element of transportation must be addressed and accommodated: pedestrians, transit, bicycles, passenger vehicles, trucks, and parking. It is also where many other aspects of public life take place including displaying civic pride, setting the tone for public activity and commerce, providing space for landscaping and accommodating storm water management and other public utilities.

The Streets Modal Element of the MTP provides guidance for achieving a greater balance among modes through the introduction of a new street typology depicted on this map and other policies that promote and enable Complete Streets. Complete Streets provide appropriate facilities to accommodate all expected transportation users and also take into account the scale and character of the streets' settings. Complete Streets do not necessarily entail dedicated facilities for each mode (e.g., transit track, bike lane, sidewalk), particularly on lower-volume streets. However, Complete Streets do ensure that travel by all modes is accommodated in a manner appropriate to the context of the street.

Complete Streets have three areas of activity: context, pedestrian space, and the travelway. The **context** of a street includes the buildings and sites adjacent to the street, or right-of-way. Land use, physical form and intensity shape the context zone. The **pedestrian space** is that which extends between the building face, or front of the private property, and the travelway. The **travelway** encompasses that portion of the public right-of-way between the curbs that is dedicated partially or exclusively to travel.

Street Typology

This map designates specific types of arterial streets. The proposed typology has been developed to shape decision-making about a given street section in terms of its planned land-use context and multi-modal function. This overlay is the principal guide for the rebalancing, redesigning and rebuilding of arterial streets to become Complete Streets that provide for all modes of travel as well as serve the adjacent land uses. More specific guidelines for improving the various designs of existing streets within each general type are set forth in the Streets Modal Element. Non-arterial (local) streets should also have designed features to complement their land-use context and function as illustrated in the table below. Arlington will also continue to use its Functional Classification of streets to guide operational and maintenance priorities. Typical elements and dimensions for each street type are illustrated in the table below. Factors such as existing and planned land-use types and intensities, right-of-way availability, travel demand, transit operations, neighborhood character, historic designations, presence of mature trees, topography, and community concerns should be considered in the development of the final dimensions and design of any street.

	Travel Lanes*	Median Priority	Target Speed	Transit Service	Bike Accommodations	Restrict/Limit Driveway Access	On-Street Parking Priority	Pedestrian Way
Arterials								
Type A-Primarily Retail Oriented Mixed-Use	2 to 4 + Turning	None	20-25	Frequent	Bike Lane / Shared Lane	Yes	High	10-16 ft Sidewalk 6 ft Furniture Zone or Tree Pits
Type B-Primarily Urban Mixed-Use	2 + Turning (one-way) 4 + Turning (two-way)	None / Low	25-30	Frequent	Bike Lane / Shared Lane	Yes	High	6-12 ft Sidewalk 6 ft Furniture Zone or Tree Pits
Type C-Primarily Commercial Centers	4 + Turning	Medium	30	Frequent	Bike Lane	No	Low	6-8 ft Sidewalk 6 ft Green Strip
Type D-Primarily Garden Apartments & Townhouse Neighborhoods	2 to 4 + Turning	High	25-30	Moderate	Bike Lane	No	High	6-8 ft Sidewalk 5-6 ft Green Strip w / Breaks
Type E-Primarily Single-Family Residential Neighborhoods	2 to 4	None / Medium	25-30	Limited	Bike Lane / Shared Lane	No	Medium	5-6 ft Sidewalk 4-6 Green Strip
Type F-Primarily Low to Medium Density Mixed Use	4 to 6	High	35-45	Limited	Dedicated Shared Use Path	Yes	None	6 ft Sidewalk or 10 ft Shared -Use Path 8+ ft Green Strip
Non-Arterial								
Urban Center Local (medium to high density)	2	Low	25	Limited-None	Bike Lane / Shared Lane	No	High	6-8 ft Sidewalk 4-6 ft Green Strip
Neighborhood (low density)	1 1/2 to 2 (yield)	Low / None	20-25	Limited-None	Shared Lane	No	High	4-6 ft Sidewalk 2-4 ft Green Strip
Alley/Service	1 to 1 1/2 (yield)	None	10	None	Shared Lane	No	Low	None/5 ft Sidewalk limited landscaping
Transitway	2	Low / None	Varies	Frequent	Shared -Use Path	Yes	None	10-12 ft Shared-Use Paths on each side 6 ft Green Strip

*Turn Lanes as Needed

Note: The nomenclature of the typologies, found in the legend and table above, is designed to help users understand the typology assignments by indicating where such street types are most commonly found. Land uses in the GLUP, other land-use plans or existing zoning designations are not meant to be affected, changed or interpreted based upon the name of an abutting street type.

High-Occupancy-Incentive Corridors

Selected limited access highways and Potomac River bridges are envisioned to have facilities, restrictions, fees and other measures that encourage high-occupancy travel. These measures can include High-Occupancy-Vehicle (HOV) lanes, High-Occupancy-Toll (HOT) lanes, ramp metering and congestion fees. The Streets Modal Element provides additional details.

Enhancing the Street Network

Arlington seeks to enhance the street network by discouraging the closure of existing streets, and encouraging the creation of alleyways and new local street sections, particularly where large blocks can be broken up, and where pedestrians can be provided with better access or fewer vehicular conflicts.

Certain areas are identified on this map as locations where the construction of new streets to improve the connectivity of the existing street network is expected as part of planned development. New connecting streets are also routinely sought through public investment or private development on an ongoing basis where they are appropriate. In either case specific alignment and street design is determined through more detailed planning processes. The Streets Modal Element provides additional details.

About Arlington

As of January 2016

Land

Land Area	25.8 Square Miles (66.82 Square Kilometers)
Highest Elevation	460 Feet (140.3 meters) above Sea Level

Population and Employment

Total Population, 2000 U.S. Census	189,453
Total Population, 2010 U.S. Census	207,627
Estimated Population, January 2016	220,400
Estimated Average Household Size, 2010 Census	2.09 persons
Estimated At-Place-Employment, Jan. 2016*	211,000 Jobs (100%)**
Construction	3,900 (1.9%)
Retail Trade	10,000 (4.8%)
Transportation and Warehousing	9,500 (4.5%)
Information	5,600 (2.7%)
Finance and Insurance	6,800 (3.2%)
Real Estate and Rental/Leasing	7,800 (3.7%)
Professional and Technical Services	45,100 (21.4%)
Hospitality and Food Services	16,200 (7.7%)
Other Services	49,200 (23.3%)
Government	58,500 (23.0%)
All Other	8,400 (4.0%)
Estimated Daytime Population, 2016	288,000

* As-place employment refers to jobs located in Arlington.
** Figures may not sum due to rounding.
Source: Arlington County Planning Division January 2016 estimates.

Development

Total Dwelling Units, 2000 U.S. Census*	90,426
Total Dwelling Units, 2010 U.S. Census*	105,404
Estimated Dwelling Units, January 2016**	112,500
Rentable Building Area in Square Feet, January 2016***	40,812,259
Total Hotel Rooms, 2016 estimate****	10,857

Sources:
* U.S. Census Bureau
** CPHD, Planning Division, Urban Design and Research Section
*** CoStar
**** Arlington Economic Development

Other Planning Documents

Arlington County Profile (June 2016)
Annual and Quarterly Development Tracking Reports (2015)

Legend

Arterial-Street Typologies
- Type A
- Type B
- Type C
- Type D
- Type E
- Type F

Neighborhood Streets
- Urban Center Local
- Residential or Commercial Local Street
- Shared Street
- Pedestrian Priority Street

Limited-Access Routes

High-Occupancy-Incentive Corridors
- I-66, I-395, VA Rte. 110, VA Rte. 27

Public Transportation Facilities
- Metro Blue Line
- Metro Orange Line
- Metro Yellow Line
- Metro Silver Line
- Railroad

Public Parks

Federal-Owned Lands

Bicycle/Pedestrian Trails
- 1 Existing Major Trail Projects
- 2 Planned Major Trail Projects

Transit Facilities
- 1 Existing/Completed Transit Projects
- 2 Planned Transit Projects

Intersection/Bridge Roadways
- 1 Existing/Completed Projects
- 2 Planned Roadway Projects

Key Facilities and Improvements

Bicycle/Pedestrian Facilities
1. W & OD Trail
2. Mt. Vernon Trail
3. Custis Trail
4. Arlington Blvd. Trail
5. Four Mile Run Trail
6. Bluemont Junction Trail
7. Four Mile Run Trail Crossing of I-395
8. Boundary Channel Bridge Underpass
9. North Tract/Mt. Vernon Trail Connection
10. Washington Blvd. West Side Trail
11. Arlington Blvd. South Side Trail
12. Route 110 South Trail
13. Columbia Pike Bike Boulevards
14. Iwo Jima Memorial Connection to Roosevelt Bridge
15. Four Mile Run Bridge
16. Rosslyn Circle Tunnel
17. Potomac Yard to Four Mile Run Trail Connector
18. Ballston Bike Station
19. Bluemont Park to Upton Hill Park Trail
20. Bike Share Stations (see MTP Bicycle Element Appendix F for additional detail)

Areas Planned for New Streets
1. Pentagon City/Metropolitan Park Area
2. Clarendon Commercial Area
3. Rosslyn-Courthouse Area
4. Columbia Pike West End
5. Columbia Pike / Town Center
6. Columbia Pike / Four Mile Run Drive Central
7. Nauck Revitalization Area
8. Virginia Square / 9th St.
9. N. Quincy Street Plan Addendum (West Ballston)
10. Crystal City Redevelopment
11. Buckingham Redevelopment
12. Columbia Pike East
13. Washington Blvd. / Kirkwood Rd.

Transit Facilities
1. WMATA Bus Garage
2. Crystal City/Potomac Yard Transitway
3. Shirlington Bus Station
4. Ballston-MU Metro Rail Station West Entrance & Multimodal Improvements (M)
5. Rosslyn Metro Rail Station Improvements (M)
6. Courthouse Metro Rail Station Second Elevator (M)
7. Pentagon City Metro Station Second Elevator (M)
8. East Falls Church Metro Station Access Improvements (M)
9. ART Light Maintenance Facility
10. Clarendon Metro Rail Station Plaza & Bicycle Parking Improvements (M)
11. Crystal City Metro Rail Station Improvements & East Entrance (VRE)
12. Crystal City Multimodal Improvements
13. Pentagon City Pedestrian Tunnel
14. Pentagon City Multimodal Improvements
15. Transitway Expansion to Pentagon City
16. Shirlington Bus Station Expansion
17. Courthouse Metro Rail Station Canopy and Escalator Entrance
18. Transit Stations

Intersection + Bridge Roadway Improvements
1. Clarendon Circle/Washington Blvd.
2. Lee Hwy./N. Harrison St. (left-turn lanes)
3. Glebe Rd. (left-turn lanes) at Lee Hwy.
4. Columbia Pike/Four Mile Run Dr.
5. Columbia Pike/Washington Blvd.
6. Arlington Blvd./Washington Blvd.
7. Arlington Blvd./Courthouse Rd./10th St.
8. Glebe Rd./Arlington Blvd.
9. S. Glebe Rd./Interstate 395
10. S. Glebe Rd./Arlington Ridge Rd. (left-turn lanes)
11. Marshall Dr./Route 110 (merge lane)
12. N. Glebe Rd. (Fairfax Dr./Wilson Blvd./Carlin Springs Rd.)
13. N. Meade St./Arlington Blvd. (Route 50) bridge rebuild
14. Long Bridge Drive/Interstate 395 interchange rebuild
15. N. Carlin Springs Rd./N. George Mason Dr. bridge replacement
16. Shirlington Rd./S. Four Mile Run Dr. bridge replacement
17. Washington Blvd. (Route 27)/Jefferson Davis Hwy. (Route 110) bridge rebuild
18. Columbia Pike Multimodal

Block Numbers on Numbered Streets

200	Ball	2000	Taft	3700	Nelson	5400	Harrison
300	Clark	2100	Uhle	3800	Oakland	5500	Illinois
400	Dale	2200	Veitch	3900	Pollard	5600	Jefferson
500	Eads	2300	Wayne	4000	Quincy	5700	Kensington
600	Fern	2400	Adams	4100	Randolph	5800	Lexington
700	Grant	2500	Barton	4200	Stafford	5900	Madison
800	Hayes	2600	Cleveland	4300	Taylor	6000	Nottingham
900	Ives	2700	Danville	4400	Utah	6100	Ohio
1000	Joyce	2800	Edgewood	4500	Vermont	6200	Powhatan
1100	Kent	2900	Fillmore	4600	Wakefield	6300	Quantico
1200	Lynn	3000	Garfield	4700	Abingdon	6400	Roosevelt
1300	Meade	3100	Highland	4800	Buchanan	6500	Sycamore
1400	Nash	3200	Irving	4900	Columbus	6600	Tuckahoe
1500	Oak	3300	Jackson	5000	Dinwiddie	6700	Underwood
1600	Pierce	3400	Kenmore	5100	Edison	6800	Van Buren
1700	Queen	3500	Lincoln	5200	Frederick	6900	Westmoreland
1800	Rolfe	3600	Monroe	5300	Greenbrier	7000	Arizona
1900	Scott						

South and West Sides are Even Address Numbers

Map prepared by GIS Mapping Center
2100 Clarendon Blvd., Suite 813
Arlington, VA 22201
Email: gismc@arlingtonva.us

Spatial reference: Virginia State Plane North, NAD 1983.
Base map updated from April 2015 digital aerial photography.
Potomac River from USGS 1:24,000 DLG files.
Cadastral and political data layers are maintained on an on-going basis.
Master Transportation Plan data effective through December 2017.

Map © 2017 Arlington County, VA

Printed: December 2017

SCALE IN FEET
0 1,200 2,400 3,600
0 0.25 0.5 0.75 1
SCALE IN MILES

FRONT

Master Transportation Plan

Introduction

This Arlington Master Transportation Plan (MTP) promot es effective travel and accessibility for the County's residents, workers, and visitors through the year 2030. It provides a framework to guide the development of projects and programs, advance the County's goals and objectives, and help direct investment. Its policies affect how people travel, however they travel. As Arlington continues to grow, the MTP plays an important part in determining how the County will accommodate that growth. The MTP is comprised of three major components: this map, a Goals and Policies document, and six detailed mode -specific documents.

About this Map

The focus of this map is to provide visual guidance on the planned Arlington street system and to geograp hically locate the major transportation facility investments identified in the plan including streets, transit and bicycle facilities. Greater detail about the background of the transportation system and plan goals, policies and objectives, is found in the other components of the MTP.

Specific maps for the Transit and Bikeways networks are included to illustrate how existing and proposed facilities will integrate to create enhanced networks. Additional details on facilities can be found in the Transit and Bicycle Modal Elements.

Facilities for pedestrians, parking, and transportation demand and systems management are not included on this map as they are difficult to illustrate on a map of this scale. The respective modal elements of the MTP provide additional details, policies and design standards.

Arlington County Transit Network

Legend

Limited-Access Routes

High-Occupancy-Incentive Corridors

Neighborhood Streets
- Other Streets
- Pedestrian Priority Streets

Flexible Transit Zones

Public Parks

Federal-Owned Lands

Potomac River

Transit Networks
- Transit Stations - Existing and Proposed
- Premium Transit Network
- Express Bus Corridor
- Primary Transit Network
- Secondary Transit Network

Public Transportation Facilities
- Existing
- Planned
- Virginia Railway Express
- Metro Station
- Metro Blue Line
- Metro Orange Line
- Metro Silver Line
- Metro Yellow Line

Transit

A key aspect of the Master Transportation Plan is the implementation of a Premium Transit Network (PrTN) in Crystal City and along Columbia Pike. The PrTN is designed to add capacity and encourage investment in areas of the County where significant growth and development is planned. The PrTN features high frequency (every 10-12 minutes), branded, and easy to understand bus routes with passenger amenities such as real-time transit information and high quality transit stations.

In addition, the expansion of the Primary Transit Network (PTN) along other primary development corridors will provide the majority of Arlington residents with all-day east-west and north-south access every 15 minutes. The PTN may be expanded further in future updates if parts of Arlington and/or adjacent communities are redeveloped at substantially higher densities. Regional express bus routes also complement PTN service.

The Secondary Transit Network (STN) offers more localized Metrobus and ART service. The STN serves the low- to moderate-density portions of Arlington and adjacent communities. The STN routes do not have the frequency or capacity of the PTN, but penetrate deeper into lower-density areas, focusing on bringing people to Metrorail stations, other service transfer points, and serving important neighborhood destinations.

In areas of the County where STN service does not meet productivity standards, the County will institute a flexible, on-demand service to connect neighborhoods with transit stations or key neighborhood destinations. This service will use smaller vehicles and could include a separate fare system. Rides would be grouped and provided on a demand-responsive basis. The County will pilot this service during off-peak periods but may expand it to include service during peak periods as well.

Key Facilities and Improvements

Transit Facilities
1. WMATA Bus Garage
2. Crystal City/Potomac Yard Transitway
3. Shirlington Bus Station
4. Ballston-MU Metro Rail Station West Entrance & Multimodal Improvements
5. Rosslyn Metro Rail Station Improvements
6. Courthouse Metro Rail Station Second Elevator
7. Pentagon City Metro Station Second Elevator
8. East Falls Church Metro Station Access Improvements
9. ART Light Maintenance Facility
10. Clarendon Metro Rail Station Plaza & Bicycle Parking Improvements
11. Crystal City Metro Rail Station Improvements & East Entrance
12. Crystal City Multimodal Improvements
13. Pentagon City Pedestrian Tunnel
14. Pentagon City Multimodal Improvements
15. Transitway Expansion to Pentagon City
16. Shirlington Bus Station Expansion
17. Courthouse Metro Rail Station Canopy and Escalator Entrance
18. Transit Stations

Arlington County Bike and Trail Network

Pedestrian Facilities

Pedestrian travel takes place throughout the County along every street and within every com mercial development. Arlington's planned sidewalk network is supplemented by shared-use and pedestrian-only paths, as well as bridges, tunnels and other crossings that improve safety and increase connectivity in walking routes. Pedestrian improvements outlined in the Pedestrian Modal Element will complete the sidewalk system to enhance connectivity and safety.

Bicycling

The Planned Bikeway Network includes on-street bike lanes and signed routes, as well as off-street shared-use paths that achieve at least one of the following:
- Serve the most important and well-used bicycle transportation corridors
- Provide access to the most important destinations within and immediately outside the County
- Provide connections to all neighborhoods within the County.

Supplementing the Bikeway Network will be ample, secure bicycle parking provided by both the County and private sector at residences, workplaces, public facilities, parks and commercial centers. Additional information can be found in the Bicycle Modal Element.

Legend

Limited-Access Routes

High-Occupancy-Incentive Corridors

Neighborhood Streets
- Other Streets
- Pedestrian Priority Streets

Public Transportation Facilities
- Metro Station
- Metro Blue Line
- Metro Orange Line
- Metro Silver Line
- Metro Yellow Line

Potomac River

On Street Bike Lanes
- Existing Bike Lanes
- Planned Bike Lanes

On Street Bike Facilities
- Existing Bikeway
- Planned Bikeway

Off Street Trail Network
- Existing Trails
- Planned Trail Projects

Public Parks

Federal-Owned Lands

Key Facilities and Improvements

Bicycle/Pedestrian Facilities
Note: Trails shown on Columbia Island (D.C.) are for displaying connectivity

1. W & OD Trail
2. Mt. Vernon Trail
3. Custis Trail
4. Arlington Blvd. Trail
5. Four Mile Run Trail
6. Bluemont Junction Trail
7. Four Mile Run Trail Crossing of I-395
8. Boundary Channel Bridge Underpass
9. North Tract/Mt. Vernon Trail Connection
10. Washington Blvd. West Side Trail
11. Arlington Blvd. South Side Trail
12. Route 110 South Trail
13. Columbia Pike Bike Boulevards
14. Iwo Jima Memorial Connection to Roosevelt Bridge
15. Four Mile Run Bridge
16. Rosslyn Circle Tunnel
17. Potomac Yard to Four Mile Run Trail Connector
18. Ballston Bike Station
19. Bluemont Park to Upton Hill Park Trail
20. Bike Share Stations (see MTP Bicycle Element Appendix F for additional detail)

SCALE IN FEET
0 2,250 4,500

Map of Metrorail System

Map prepared by GIS Mapping Center
2100 Clarendon Blvd., Suite 813
Arlington, VA 22201
Email: gismc@arlingtonva.us

Spatial reference: Virginia State Plane North, NAD 1983.
Base map updated from April 2015 digital aerial photography.
Potomac River from USGS 1:24,000 DLG files.
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Master Transportation Plan data effective through December 2017.

Map © 2017 Arlington County, VA
Printed: December 2017

BACK

Arlington County, VA Materials Testing Specification Reference (September 2020)

MATERIAL AND TEST (*REF. - VDOT TEST METHODS MANUAL)*	VDOT ROAD AND BRIDGE SPECIFICATION 2002 (*Or Latest Version)*	MINIMUM RATE OF SAMPLING (*REF. - VDOT MANUAL OF INSTRUCTIONS)*	LOCATION OF SAMPLING	REMARKS
SOILS AND AGGREGATES				
1. Embankments				
(a) Density, Any Method	303.04(h)	One (1) test per 2500 yd3 or less plus: (a) for fills less than 500 ft. length one (1) test on every other 6-in. layer bottom to top of fill starting with the second lift; (b) for fills from 500-2000 ft. length, two (2) tests per 6-in. layer within top five (5) ft. of fill; (c) for fills greater than 2000 ft length, break into equal segments not to exceed 2000 ft. and use same frequency for each section as for fills 500 to 2000 ft. in length.	Roadway	When tests are not run due to gravel, muck, rock, etc. give station and depth on report in lieu of test, with reason. For nuclear test, use Direct Transmission Method, VTM-10. See Notes 1 and 2.
2. Finished Sub-grade (Both Cut and Fill Sections)				
(a) Density, Any Method	305.03	One (1) test per 2000 continuous linear ft. of roadway and one test minimum per intersection per construction location	Roadway (24 ft.)	For nuclear test, use Direct Transmission Method, VTM-10. See Notes 1 and 2.

Arlington County, VA Materials Testing Specification Reference (September 2020)

MATERIAL AND TEST (*REF. - VDOT TEST METHODS MANUAL)*	VDOT ROAD AND BRIDGE SPECIFICATION 2002 (*Or Latest Version)*	MINIMUM RATE OF SAMPLING (*REF. - VDOT MANUAL OF INSTRUCTIONS)*	LOCATION OF SAMPLING	REMARKS
(b) Density, Any Method	305.03	One (1) test per continuous section/block/or intersection	Curb, Comb. Curb and Gutter	For nuclear test, use Direct Transmission Method, VTM-10. See Notes 1 and 2.
(c) Density, Any Method	305.03	One (1) test per continuous section/block/or intersection	Sidewalk	For nuclear test, use Direct Transmission Method, VTM-10. See Notes 1 and 2.
3. Central Mix Aggregate (Treated or Un-treated) Base, Subbase, and Select Material				
(a) Density, Any Method	305.03, 308.03, & 309.05,	One (1) test per 1/2 mile or less per continuous lane application width per layer. If testing by nuclear method, each test shall consist of average of five (5) readings.	Roadway. Location of five (5) nuclear readings at randomly selected sites.	For nuclear tests, use Backscatter, Control Strip Method, VTM-10. With nuclear method, set up roller pattern and control strip for each layer or lift placed. See Notes 1 and 2.
(b) Density, Any Method	305.03, 308.03, & 309.05,	One (1) test per continuous section/block/or intersection	Curb, Comb. Curb and Gutter	For nuclear test, use Direct Transmission Method, VTM-10. See Notes 1 and 2.
(c) Density, Any Method	305.03, 308.03, & 309.05,	One (1) test per continuous section/block/or intersection	Sidewalk	For nuclear test, use Direct Transmission Method, VTM-10. See Notes 1 and 2.

Arlington County, VA Materials Testing Specification Reference (September 2020)

MATERIAL AND TEST (*REF. - VDOT TEST METHODS MANUAL)*	VDOT ROAD AND BRIDGE SPECIFICATION 2002 (*Or Latest Version)*	MINIMUM RATE OF SAMPLING (*REF. - VDOT MANUAL OF INSTRUCTIONS)*	LOCATION OF SAMPLING	REMARKS
4. Backfill for Pipes and Box Culverts	302.03, 303.04(g), 401.03(i)	Minimum one test per lift on alternating sides of pipe for each 300 feet of pipe or portion thereof. Test pattern is to begin after first 4" compacted layer above the structures bedding and continue to 1' above top of pipe or box culvert structure. For rate of testing greater than 1' above top of pipe refer to contract documents and Rate of Sampling for embankments.	Alternating sides of structure	For nuclear test, use Direct Transmission Methods, VTM-10. See Notes 1 and 2. Backfill lifts shall be compacted in horizontal layers not more than 6 inches in thickness, loose measurement. (Or as Specified by the Contract Documents)
5. Backfill for Drop Inlets	302.03, 303.04(g)	Minimum one test every other lift around the perimeter beginning after the first 4" compacted layer above the bedding and continue to top of the structure. Stagger tests to ensure consistent compaction effort has been achieved.	Perimeter of structure	To include drop inlets, junction boxes, etc. For nuclear test, use Direct Transmission Methods, VTM-10. See Notes 1 and 2. Backfill lifts shall be compacted in horizontal layers not more than 6 inches in thickness, loose measurement. (Or as Specified by the Contract Documents)
6. Backfill for Manholes	302.03, 303.04(g)		Perimeter of structure	For nuclear test, use Direct Transmission Methods, VTM-10. See Notes 1 and 2. Backfill lifts shall be compacted in horizontal layers not more than 6 inches in thickness, loose measurement. (Or as Specified by the Contract Documents)

Arlington County, VA Materials Testing Specification Reference (September 2020)

MATERIAL AND TEST (*REF. - VDOT TEST METHODS MANUAL)*	VDOT ROAD AND BRIDGE SPECIFICATION 2002 (*Or Latest Version)*	MINIMUM RATE OF SAMPLING (*REF. - VDOT MANUAL OF INSTRUCTIONS)*	LOCATION OF SAMPLING	REMARKS
HYDRAULIC CEMENT CONCRETE				
1. Sidewalk, Curb, Comb. Curb and Gutter				
(a) Temperature Measurements	217	One test per batch (truck), and when making compressive specimens.	At job site, and prior to placing concrete in forms.	If test on any batch fails, recheck batch immediately before rejecting. Enter results of tests in project records.
(b) Air Content	217	One test per batch (truck), and when making compressive specimens	At job site, and prior to placing concrete in forms	Any of 3 approved methods may be used for this test. However, with any test method used, with readings indicating concrete to be outside of specification must be confirmed first with test by Pressure Method before rejection of concrete. Enter results in project records.
(c) Consistency (Slump Test).	217	One test per batch (truck), and when making compressive specimens.	At job site, and prior to placing concrete in forms.	If test on any batch fails, recheck batch immediately before rejecting. Enter results in project records.

MATERIAL AND TEST (*REF. - VDOT TEST METHODS MANUAL)*	VDOT ROAD AND BRIDGE SPECIFICATION 2002 (*Or Latest Version)*	MINIMUM RATE OF SAMPLING (*REF. - VDOT MANUAL OF INSTRUCTIONS)*	LOCATION OF SAMPLING	REMARKS
(d) Compressive Strength...	217	For miscellaneous concrete, one set of 3 cylinders shall be made for each 250 cubic yards, with a minimum of one set of 3 per day. Any one set to be made from same batch. For structural concrete, one set of 3 cylinders shall be made for each 100 cubic yards of concrete placed, with a minimum of 2 sets of 3 cylinders each per structure per class of concrete. Any one set to be made from same batch.	At job site.	Molding and Curing Molds shall be placed on a rigid horizontal surface free from vibration and other disturbances during the first 24 hours, all test specimens shall be stored under conditions that maintain the temperature immediately adjacent to the specimens in the range of 60℉ to 80℉, and prevent loss of moisture. Testing Except when high-early strength concrete is specified, compressive strength testing will be performed at 28 days.

Arlington County, VA Materials Testing Specification Reference (September 2020)

MATERIAL AND TEST (*REF. - VDOT TEST METHODS MANUAL)*	VDOT ROAD AND BRIDGE SPECIFICATION 2002 (*Or Latest Version)*	MINIMUM RATE OF SAMPLING (*REF. - VDOT MANUAL OF INSTRUCTIONS)*	LOCATION OF SAMPLING	REMARKS
ASPHALT PAVEMENT				
(a) In-Place Pavement Density by Nuclear Method (Roller Pattern)/ (Control Strip) (Asphalt Pavement)	Roads and Bridges Section 315.05 VTM-76 AASHTO T-166	Establish Roller pattern and Control Strip according to VTM-76. Ten (10) stratified random sample to establish target density. Verify minimum density achieved with cores per VTM-76. **QC technician shall be certified and pass State proficiency**	Field	Contractor/Asphalt Producer shall provide Certified Asphalt Paving Technician for density testing
(b) In-place Pavement Density by Nuclear Method and/or VDOT cores Test Section) (Asphalt Pavement)	Roads and Bridges Section 315.05 VTM-76 AASHTO T-166	Test Section- Lot Size: 5000 ft. per Lane width. Ten (10) stratified random samples per lot for nuclear gauge and/or five(5) stratified random plug/cores per lot **QC technician shall be certified and pass State proficiency**	Field	Contractor/Asphalt Producer shall provide Certified Asphalt Paving Technician for density testing
(c) Temperature Measurements	Roads and Bridges 211.08	One temperature measurement initially on first and fifth loads, each type mix each production day, and thereafter minimum of one per hour of production time for each mix type, by Producer's Certified Asphalt	QC - Processing or mixing plant from back of truck **QA – Field**	The Contractor should take and record temperature measurements of the asphalt concrete at the beginning of paving operations and thereafter at a rate of not less than one measurement every hour. The

Arlington County, VA Materials Testing Specification Reference (September 2020)

MATERIAL AND TEST (*REF. - VDOT TEST METHODS MANUAL)*	VDOT ROAD AND BRIDGE SPECIFICATION 2002 (*Or Latest Version)*	MINIMUM RATE OF SAMPLING (*REF. - VDOT MANUAL OF INSTRUCTIONS)*	LOCATION OF SAMPLING	REMARKS
		Concrete Technician. If any test outside of tolerance, minimum of 3 additional tests made in different points of the load, and 4 tests averaged and average used as temperature of load or batch.		Project Officer may increase the frequency of temperature measurements at any time. The temperature should be checked using an appropriate heat-sensing device (i.e. probe thermometer, infrared thermometer, etc.).

Note 1. Density tests are reported on Forms TL-53, TL-54, TL-55, TL-124, TL-125 (Sand Cone Method), and TL-125A (One-Point Proctor Method).

Note 2. If there is a breakdown in the nuclear testing equipment, then density testing shall continue using other approved methods.

REVISED ON 05/23/2018

GENERAL NOTES:

1. EXISTING UTILITY INFORMATION IS BASED ON ARLINGTON COUNTY RECORD DRAWINGS, COUNTY WATER AND SEWER MAPPING, AERIAL PHOTOGRAPHS, AND APPROXIMATE LOCATING OF SURFACE FEATURES IN THE FIELD. THE CONTRACTOR IS RESPONSIBLE FOR MARKING AND TEST PITTING ALL UTILITIES PRIOR TO EXCAVATION TO CONFIRM THE EXISTING FIELD CONDITIONS. ADDITIONALLY, THE CONTRACTOR SHALL TEST PIT OTHER LOCATION AS DIRECTED BY THE ARLINGTON COUNTY INSPECTOR. IF THE EXISTING FIELD CONDITIONS VARY FROM THAT HAVE BEEN ILLUSTRATED ON THE PLANS, THE CONTRACTOR SHALL IMMEDIATELY INFORM ARLINGTON COUNTY AND THE ENGINEER PRIOR TO PROCEEDING WITH THE WORK.
2. EXISTING WATER METERS SHOWN ON THE PLANS ARE APPROXIMATE AND MAY BE INCOMPLETE. THE CONTRACTOR SHALL CONFIRM WATER METER LOCATION AND WATER SERVICE LINE LOCATION WITH ARLINGTON COUNTY. WATER SERVICES REQUIRED TO BE TRANSFERRED FROM THE EXISTING 6-INCH MAIN OR 8-INCH MAIN TO THE NEW 8-INCH WATER MAIN ARE AS FOLLOWS:

   #24, #127, #202 N HIGHLAND ST. WATER METER COULD NOT BE LOCATED DURING DESIGN, NEW SERVICE LINE SHOWN ON THE PLAN IS AT AN ASSUMED METER LOCATION.
3. THE CONTRACTOR SHALL TEST PIT ALL UTILITY CROSSINGS BEFORE WATER MAIN EXCAVATION.
4. SANITARY SEWER LATERAL LOCATIONS ARE APPROXIMATE. THE CONTRACTOR IS REQUIRED TO FIELD LOCATE ALL SEWER LATERALS PRIOR TO WATER MAIN EXCAVATION.

   #3100 1ST ST. N (EXISTING SEWER LATERALS COULD NOT BE LOCATED DURING DESIGN)
5. A MINIMUM VERTICAL SEPARATION OF 18-INCH BETWEEN THE WATER MAIN AND THE SANITARY SEWER LINE SHALL BE MAINTAINED UNLESS DIRECTED OTHERWISE BY THE ENGINEER.
6. PROPOSED GAS MAIN TO BE INSTALLED BY OTHERS PRIOR TO WATER MAIN CONSTRUCTION. THE LOCATIONS SHOWN ON THE PLANS ARE APPROXIMATE. THE CONTRACTOR IS REQUIRED TO FIELD LOCATE PROPOSED GAS MAIN PRIOR TO PERFORMING ANY EXCAVATION. THE EXISTING GAS MAIN IS TO BE ABANDONED ON SITE. THE CONTRACTOR SHALL COORDINATE WITH WASHINGTON GAS TO ENSURE THE SAFE REMOVAL OF ANY ABANDONED GAS LINE.

LEGEND

6" W — EXISTING WATER MAIN TO BE ABONDONED

EASEMENT NOTES:

THE PROPOSED 8-INCH WATER MAINS ARE LOCATED COMPLETELY WITHIN THE COUNTY R.O.W. AND/OR WITHIN THE EXISTING WATER MAIN EASEMENT. NEITHER PERMANENT WATER MAIN EASEMENTS NOR TEMPORARY CONSTRUCTION EASEMENTS ARE REQUIRED FOR THIS PROJECT.

PERMITS NOTE:

PERMITS REQUIRED FOR THE PROJECT INCLUDE, BUT ARE NOT LIMITED TO:

- COUNTY LAND DISTURBING ACTIVITIES (LDA) PERMIT
- COUNTY PUBLIC RIGHT-OF-WAY (PROW) PERMIT
- COUNTY TRANSPORTATION RIGHT-OF-WAY (TROW) PERMIT

FILENAME: R085-240-WATERMAIN_P_AND_P.DWG PATH: Q:\DATA\R085\DESIGN\CAD\ACTIVE PLOTTED BY: VSHEPELEVA

ARLINGTON VIRGINIA

DEPARTMENT OF ENVIRONMENTAL SERVICES
FACILITIES & ENGINEERING DIVISION
ENGINEERING BUREAU
2100 CLARENDON BOULEVARD, SUITE 813
ARLINGTON, VA 22201
PHONE: 703.228.3629
FAX: 703.228.3606

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SEAL

COMMONWEALTH OF VIRGINIA
JIONG LIN
Lic. No. 0402051875
12/16/2019
PROFESSIONAL ENGINEER

APPROVALS	DATE
QUALITY CONTROL ENGINEER	12.16.2019
CONSTRUCTION MANAGEMENT SUPERVISOR	12/16/19
WATER, SEWER, STREETS BUREAU CHIEF	12/17/19
TRANSPORTATION DIRECTOR	12/23/19
PROJECT MANAGER	12/17/2019

REVISIONS	DATE

N HIGHLAND ST WATERMAIN
R085
2ND ST N TO ARLINGTON BLVD

WATERMAIN PLAN & PROFILE I

DESIGNED: VS
DRAWN: VS
CHECKED: JL
MISS UTILITY TRANSMITTAL #: 5390

PLOTTED: DECEMBER 26 2019

SCALE:

GRAPHIC SCALE
25 0 25
SCALE: 1" = 25'

SHEET C051.1

REVISED ON 05/23/2018

GENERAL NOTES:

1. EXISTING UTILITY INFORMATION IS BASED ON ARLINGTON COUNTY RECORD DRAWINGS, COUNTY WATER AND SEWER MAPPING, AERIAL PHOTOGRAPHS, AND APPROXIMATE LOCATING OF SURFACE FEATURES IN THE FIELD. THE CONTRACTOR IS RESPONSIBLE FOR MARKING AND TEST PITTING ALL UTILITIES PRIOR TO EXCAVATION TO CONFIRM THE EXISTING FIELD CONDITIONS. ADDITIONALLY, THE CONTRACTOR SHALL TEST PIT OTHER LOCATION AS DIRECTED BY THE ARLINGTON COUNTY INSPECTOR. IF THE EXISTING FIELD CONDITIONS VARY FROM THAT HAVE BEEN ILLUSTRATED ON THE PLANS, THE CONTRACTOR SHALL IMMEDIATELY INFORM ARLINGTON COUNTY AND THE ENGINEER PRIOR TO PROCEEDING WITH THE WORK.

2. EXISTING WATER METERS SHOWN ON THE PLANS ARE APPROXIMATE AND MAY BE INCOMPLETE. THE CONTRACTOR SHALL CONFIRM WATER METER LOCATION AND WATER SERVICE LINE LOCATION WITH ARLINGTON COUNTY. WATER SERVICES REQUIRED TO BE TRANSFERRED FROM THE EXISTING 6-INCH MAIN OR 8-INCH MAIN TO THE NEW 8-INCH WATER MAIN ARE AS FOLLOWS:

   #24, #127, #202 N HIGHLAND ST. WATER METER COULD NOT BE LOCATED DURING DESIGN, NEW SERVICE LINE SHOWN ON THE PLAN IS AT AN ASSUMED METER LOCATION.

3. THE CONTRACTOR SHALL TEST PIT ALL UTILITY CROSSINGS BEFORE WATER MAIN EXCAVATION.

4. SANITARY SEWER LATERAL LOCATIONS ARE APPROXIMATE. THE CONTRACTOR IS REQUIRED TO FIELD LOCATE ALL SEWER LATERALS PRIOR TO WATER MAIN EXCAVATION.

   #3100 1ST ST. N (EXISTING SEWER LATERALS COULD NOT BE LOCATED DURING DESIGN)

5. A MINIMUM VERTICAL SEPARATION OF 18-INCH BETWEEN THE WATER MAIN AND THE SANITARY SEWER LINE SHALL BE MAINTAINED UNLESS DIRECTED OTHERWISE BY THE ENGINEER.

6. PROPOSED GAS MAIN TO BE INSTALLED BY OTHERS PRIOR TO WATER MAIN CONSTRUCTION. THE LOCATIONS SHOWN ON THE PLANS ARE APPROXIMATE. THE CONTRACTOR IS REQUIRED TO FIELD LOCATE PROPOSED GAS MAIN PRIOR TO PERFORMING ANY EXCAVATION. THE EXISTING GAS MAIN IS TO BE ABANDONED ON SITE. THE CONTRACTOR SHALL COORDINATE WITH WASHINGTON GAS TO ENSURE THE SAFE REMOVAL OF ANY ABANDONED GAS LINE.

LEGEND

6" W — EXISTING WATER MAIN TO BE ABONDONED

EASEMENT NOTES:

THE PROPOSED 8-INCH WATER MAINS ARE LOCATED COMPLETELY WITHIN THE COUNTY R.O.W. AND/OR WITHIN THE EXISTING WATER MAIN EASEMENT. NEITHER PERMANENT WATER MAIN EASEMENTS NOR TEMPORARY CONSTRUCTION EASEMENTS ARE REQUIRED FOR THIS PROJECT.

PERMITS NOTE:

PERMITS REQUIRED FOR THE PROJECT INCLUDE, BUT ARE NOT LIMITED TO:

- COUNTY LAND DISTURBING ACTIVITIES (LDA) PERMIT
- COUNTY PUBLIC RIGHT-OF-WAY (PROW) PERMIT
- COUNTY TRANSPORTATION RIGHT-OF-WAY (TROW) PERMIT

ARLINGTON VIRGINIA

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ARLINGTON, VA 22201
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FAX: 703.228.3606

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SEAL

COMMONWEALTH OF VIRGINIA
JIONG LIN
Lic. No. 0402051875
12/16/2019
PROFESSIONAL ENGINEER

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TRANSPORTATION DIRECTOR	12/23/19
PROJECT MANAGER	12/17/2019

REVISIONS	DATE

N HIGHLAND ST WATERMAIN
R085
2ND ST N TO ARLINGTON BLVD

WATERMAIN PLAN & PROFILE II

DESIGNED: VS
DRAWN: VS
CHECKED: JL
MISS UTILITY TRANSMITTAL #: 5390

PLOTTED: DECEMBER 26 2019

SCALE:

GRAPHIC SCALE
25 0 25
SCALE: 1" = 25'

SHEET C051.2

FILENAME: R085-240-WATERMAIN_P_AND_P.DWG PATH: Q:\DATA\R085\DESIGN\CAD\ACTIVE PLOTTED BY: VSHEPELEVA

WASHINGTON GAS LIGHT COMPANY

VA SAVE PROGRAM 2 - BARE STEEL MAIN REPLACEMENT

N HIGHLAND ST

ARLINGTON COUNTY, VA

RIGHT-OF-WAY AND PERMIT INFO	# OF SERVICES AFFECTED	FOOTAGE OF MAIN INSTALLED	FOOTAGE OF MAIN ABANDONMENT
ARLINGTON COUNTY ROW - PERMIT #898507	12	755 FEET	670 FEET
OUTSIDE ROW	0	0 FEET	0 FEET
TOTAL	12	755 FEET	670 FEET

(TOTAL # SERVICES TO BE: REPLACED - 9, TRANSFERRED - 3, ABANDONED - 0)

NOTES:

1. CONTRACTOR NEEDS TO CONTACT CORROSION CONTROL SUPERVISOR TO HAVE TECHNICIAN INSPECT AND TEST WIRES WHEN INSTALLED. REFERENCE DRAWING: TD-7140-I-002.
   DAVE BROWN: 202-624-6440 (PG CO, NE, SE, & SW DC)
   TREVOR DIEDERICH: 703-750-7744 (VIRGINIA)
   BRIAN AMOS: 202-624-6271 (MO CO & NW DC)
2. INSTALL EXCESS FLOW VALVE(S) PER TABLE IN ACCORDANCE WITH OPERATIONAL & MAINTENANCE MANUAL SECTION 5204. EFV'S ARE NOT INSTALLED ON LOW PRESSURE SERVICES OR LOADS GREATER THAN 10,000SCFH. CURB VALVES MUST BE INSTALLED ON ALL SERVICES NOT HAVING AN EXCESS FLOW VALVE.
3. VERIFY FEEDS WITH ENGINEER AT START OF CONSTRUCTION AND NEED FOR BYPASS(ES) AT TIE-INS. CONTACT ENGINEER FOR CONFIRMATION OF REQUIRED SIZE AND TEMPERATURE RESTRICTIONS.
4. DRAWING CREATED WITH ELECTRONIC FILE EXTRACT FROM WG MAPPING SYSTEM, DUE TO THE SCHEMATIC NATURE OF THE SYSTEM, WASHINGTON GAS DESIGN DOES NOT MAKE ANY GUARANTEE AS TO THE ACCURACY OF INFORMATION CONTAINED THEREIN. REFERENCE SERVICE RECORD CARDS. LOCATION AND DEPTHS OF UTILITIES MUST BE CONFIRMED IN FIELD BY CONTRACTOR PRIOR TO CONSTRUCTION.
5. WHEN WRAPPED STEEL PIPE IS ACCESSED FOR A PERMANENT REPAIR OR NEW INSTALL, A PIPE-TO-SOIL POTENTIAL READING MUST BE TAKEN AND RECORDED ON THE APPROPRIATE FIELD ORDER. PLEASE REFER TO O&M 4084-REPARING STEEL PIPELINES.
6. FOR ANY BUILDING WITH AN EXISTING INDOOR METER, CONTRACTOR SHALL ATTEMPT TO RELOCATE THE METER TO THE EXTERIOR OF THE BUILDING IN ACCORDANCE WITH O&M STANDARD SECTION 5111. IN ALL CASES, A BUILDING WITH AN INDOOR METER SHALL HAVE THE PRESSURE REGULATOR LOCATED OUTSIDE THE EXTERIOR BUILDING WALL, IN ACCORDANCE WITH O&M STANDARD SECTION 5111.

SITE LOCATION

ARLINGTON, VIRGINIA
VICINITY MAP
NOT TO SCALE

VA SAVE PROGRAM 2
SITE LOCATION MAP
NOT TO SCALE

EXCESS FLOW VALVES MATERIAL ALERT

Effective Date: April 14, 2017 | Alert No. M-2017-1

Reference: O&M Section 5204, "Excess Flow Valves"

Purpose: To emphasize Washington Gas policy regarding the selection of excess flow valves (EFVs) for use on service lines, provide a list of EFVs in the WG inventory, and provide a quick reference for EFV selection.

Page 2 of 2

3. EFV Selection. Consult the following table when selecting EFVs for a specific service. These guidelines do not cover all situations. See OM-5204 and OM-5128 for details:

Meter Size	Meter or Meter Bank Count*	EFV Series***
AC250	Less than 3 meters	700
	3-5 meters	1800
	6-15 meters	5500
	15-20 meters	10000
AL425 (20LT)	Single meter	1800
	2-5 meters	5500
	6-9 meters	10000
AL425HC (30LT)	Single meter	1800
	2-5 meters	5500
	6-9 meters	10000
1.5M **	Single meter	1800
2M	Single meter	5500
3M **	Single meter	5500
5M	Single meter	10000
7M	Single meter	10000

*Assuming uniform meter size within meter bank. For multiple meter types, sum individual meter capacities to determine EFV series (See O&M Section 5204 & Table 5128-3, assuming 2 psig delivery pressure)

**EFVs listed are for meters which are located downstream of the regulator. For meters which are upstream of the regulator, see O&M Section 5204 & Table 5128-3 to determine appropriate meter capacity and EFV.

* * *

- Use a series 700 EFV for all service lines containing 1/2" tubing
- Use a series 1800 EFV for 3/4" service lines
- Curb valves are preferred on all low pressure services. Where low pressure services have total meter capacities exceeding 1,000 SCFH, a curb valve is required.
- Any service line 4" or greater will require a curb valve (no EFV)
- 11M & larger meters will require a curb valve (no EFV)

PREPARED BY: ACK SML JWW
PDATE 4 3 2017

INSTALL METHOD
SERVICES TO BE REPLACED VIA INSERTION UNLESS OTHERWISE DETERMINED IN THE FIELD

LEGEND

- HSE # (C/O) = SERVICE CHANGE OVER
- HSE # (REP) = SERVICE REPLACE (FULL LENGTH)
- = PROPOSED EXCESS FLOW VALVE
- = EXISTING METER
- = PROPOSED METER LOCATION (METER TO BE MOVED FROM INSIDE TO OUTSIDE)
- D# = DISCONNECTION WITH IDENTIFICATION NUMBER
- T# = TIE-IN WITH IDENTIFICATION NUMBER
- = PAVING BY OTHERS
- = PAVING BY WGL CONTRACTOR

COMMONWEALTH OF VIRGINIA
KRAIVIT SRISUEWATTANANAN
LICENSE No. 0402031954
PROFESSIONAL ENGINEER
Dated 5/13/20
Expired 6/30/21
of BCA 291006

ENengineering

QUALITY CONTROL CHECKED BY	DATE
ANDREW BRAUN	10/23/19
DEREK LEVY	01/10/20

Washington Gas
A WGL Company
6801 Industrial Road
Springfield, Virginia 22151
Telephone: 703-750-1000

T/I Gassed out Dry
Date: _____

As-built Drawing Pressure Test Data:
WC ID: _____
Span No. _____
Test Press (PSIG):
☐ 90 ☐ 100 ☐ 150 ☐ OTHER _____
Duration (Mins): _____
Medium : ☐ A ☐ N ☐ W
RIP : ☐ Yes ☐ No
Date : _____
Resp. Person : _____ (print name)
_____ (signature)
Notes: _____

Observation Data:
WC ID: _____
Point No. _____
Pipe Type: ☐ MN ☐ SVC ☐ H/L
Size: _____
Mat'l : ☐ PLA ☐ WRPD ☐ ____ ☐ STL ☐ CI
Pipe Cover : _____ (inches)
External Corrosion : ☐ YES ☐ NO ☐ N/A
Internal Corrosion : ☐ YES ☐ NO ☐ N/A
Corrosion Type: A B C D E F G H O X
Max Pit Depth : _____ (thousandths)
Coating Condition : _____

Abandonment Pipe Purge Data:
Purge out of Service : ☐ Yes ☐ No
Purge from : _____
Purge to : _____
Purging Medium : ☐ Air ☐ Nitrogen
Final Gas Reading : _____
Resp. Person : _____ (print name)
Notes: _____

No.	Date	Reason
1	7/16/2020	ADDED ADDITIONAL TREE NOTES AND TREE PROTECTION

REMEMBER TO WEAR YOUR PPE.

Safety Sector: 00605	ADC Map: VAAR5647F1
Quad Map: L0035W	Tax Map Page: V0001
Scale: NTS	Plane: VA 83 / WMIS Permit No. 898507
Drawn by: (ENE) MJJ	Phone: (443) 577 3284 / Date: 10/23/2019
Checked by: (ENE) DON SRISUKWATTANANAN	Date: 01/06/2020
WR / WO Number: 3553640 MNRPL	

ARLINGTON COUNTY, VA
VA SAVE PROGRAM 2
MAIN REPLACEMENT
N HIGHLAND ST
ARLINGTON, VIRGINIA

PATH: J:\PROJECT\WGL\191000-1100\BG24\WORKING_DRAWINGS\BCA-291006-1\1BG1\1BG1-BEST.DWG PLOTTED: 6/4/2019 11:54 AM

Job Status: FOR CONSTRUCTION
Drawing Number: BCA-291006- 1
Sheet Number: 1 OF 11

AS BUILT CHECKLIST

___ PIPE LOCATED
___ ENDS: PERMANENT-LOCATED/LABELED
TIE IN & TEMP DE-LABELED
___ FITTINGS VERIFIED/LOCATED
(TEES, BENDS, VALVES, ETC.)
___ DRY OR GASSED OUT INFO
___ FOOTAGE INSTALLED
MATCHES DPR/FIELD ORDER

MAIN INSTALL METHOD

DIRECT BURIAL INSERTED DIRECT DRILL

TOTAL FOOTAGE INSTALLED

2" _____ 4" _____ 6" _____
8" _____ 12" _____
OTHER: _____

MATERIAL CHECKLIST

	#INSTL'D	SIZE
COUPLING/S		
TEE/S		
VALVE/S		
END CAPS		
90° ELL		
45° ELL		
OTHER:		

MUST FOLLOW TREE
PROTECTION
GUIDELINES SPECIFIED
ON SHEET 11

COMMONWEALTH OF VIRGINIA
ERAWIT SRISUKWATTANANAN
LICENSE No. 0402051954
PROFESSIONAL ENGINEER
Dated 5/13/20
Expired 6/30/21
For BCA 291006

25 0 25 50 75
1 INCH = 25 FEET

TYPICAL ELEVATION VIEW

LEGEND:

EXISTING GAS
PROPOSED GAS
RIGHT OF WAY

PROPOSED GAS TO MAINTAIN A MINIMUM OF 1'-0" VERTICAL AND 5'-0" HORIZONTAL CLEARANCE FROM WATER AND SEWER FACILITIES UNLESS OTHERWISE SPECIFIED BY JURISDICTION.

DIG WITH CARE. Call Miss Utility @ 811. KEEP VIRGINIA'S SAFE

REMEMBER TO WEAR YOUR PPE.

Washington Gas
A WGL Company
6801 Industrial Road
Springfield, Virginia 22151
Telephone: 703-750-1000

T/I Gassed out Dry
Date: _____

As-built Drawing Pressure Test Data:
WC ID: _____
Span No. _____
Test Press (PSIG):
☐ 90 ☐ 100 ☐ 150 ☐ OTHER _____
Duration (Mins): _____
Medium : ☐A ☐N ☐W
RIP : ☐ Yes ☐ No
Date : _____
Resp. Person : _____ print name
signature
Notes: _____

Observation Data:
WC ID: _____
Point No. _____
Pipe Type: ☐MN ☐SVC ☐H/L
Size: _____
Mat'l : ☐PLA ☐WRPD ☐____ ☐STL ☐CI
Pipe Cover : _____ (inches)
External Corrosion : ☐YES ☐NO ☐N/A
Internal Corrosion : ☐YES ☐NO ☐N/A
Corrosion Type: A B C D E F G H O X
Max Pit Depth : _____(thousandths)
Coating Condition : _____

Abandonment Pipe Purge Data:
Purge out of Service : ☐Yes ☐No
Purge from : _____
Purge to : _____
Purging Medium : ☐Air ☐Nitrogen
Final Gas Reading : _____
Resp. Person : _____ print name
Notes: _____

Revisions			
No.	Date	Reason	
1	7/16/2020	ADDED ADDITIONAL TREE NOTES AND TREE PROTECTION	

Safety Sector: 00605	ADC Map: VAAR5647F1
Quad Map: L0035W	Tax Map Page: V0001
Scale: 1" = 25' / Plane: VA 83	WMIS Permit No. 898507
Drawn by: (ENE) MJJ / Phone: (443) 577 3284	Date: 10/23/2019
Checked by: (ENE) DON SRISUKWATTANANAN	Date: 01/06/2020
WR / WO Number: 3553640 MNRPL	

ARLINGTON COUNTY, VA

VA SAVE PROGRAM 2
MAIN REPLACEMENT
N HIGHLAND ST
ARLINGTON, VIRGINIA

PATH: U:\PROJECTS\WGL\191500_1\00\90238\WORKING_DRAWINGS\BCA-291006-1THRU10-REV1.DWG PLOTTED: 6/4/2021 11:15 AM

Job Status: FOR CONSTRUCTION
Drawing Number: BCA-291006- 2
Sheet Number: 2 OF 11

AS BUILT CHECKLIST

___ PIPE LOCATED

___ ENDS: PERMANENT-LOCATED/LABELED
TIE IN & TEMP DE-LABELED

___ FITTINGS VERIFIED/LOCATED
(TEES, BENDS, VALVES, ETC.)

___ DRY OR GASSED OUT INFO

___ FOOTAGE INSTALLED
MATCHES DPR/FIELD ORDER

MAIN INSTALL METHOD

DIRECT BURIAL INSERTED DIRECT DRILL

TOTAL FOOTAGE INSTALLED

2" _____ 4" _____ 6" _____
8" _____ 12" _____
OTHER: _____

MATERIAL CHECKLIST

	#INSTL'D	SIZE
COUPLING/S		
TEE/S		
VALVE/S		
END CAPS		
90° ELL		
45° ELL		
OTHER:		

MUST FOLLOW TREE
PROTECTION
GUIDELINES SPECIFIED
ON SHEET 11

COMMONWEALTH OF VIRGINIA
ERAWUT SRISUKWATTANANAN
LICENSE No. 0402051954
PROFESSIONAL ENGINEER
Dated 5/13/20
Expired 6/30/21
For BCA 291006

25 0 25 50 75
1 INCH = 25 FEET

TYPICAL ELEVATION VIEW

LEGEND:

EXISTING GAS
PROPOSED GAS
RIGHT OF WAY

PROPOSED GAS TO MAINTAIN A MINIMUM OF 1'-0" VERTICAL AND 5'-0" HORIZONTAL CLEARANCE FROM WATER AND SEWER FACILITIES UNLESS OTHERWISE SPECIFIED BY JURISDICTION.

DIG WITH C.A.R.E. Call Miss Utility @ 811 KEEP VIRGINIA'S SAFE

REMEMBER TO WEAR YOUR PPE.

Washington Gas
A WGL Company
6801 Industrial Road
Springfield, Virginia 22151
Telephone: 703-750-1000

T/I Gassed out Dry
Date: _____

As-built Drawing Pressure Test Data:
WC ID: _____
Span No. _____
Test Press (PSIG):
☐ 90 ☐ 100 ☐ 150 ☐ OTHER _____
Duration (Mins): _____
Medium : ☐ A ☐ N ☐ W
RIP : ☐ Yes ☐ No
Date : _____
Resp. Person : _____
print name
signature
Notes: _____

Observation Data:
WC ID: _____
Point No. _____
Pipe Type: ☐ MN ☐ SVC ☐ H/L
Size: _____
Mat'l : ☐ PLA ☐ WRPD ☐ ____
☐ STL ☐ CI
Pipe Cover : _____ (inches)
External Corrosion : ☐ YES ☐ NO ☐ N/A
Internal Corrosion : ☐ YES ☐ NO ☐ N/A
Corrosion Type: A B C D E
F G H O X
Max Pit Depth : _____ (thousandths)
Coating Condition : _____

Abandonment Pipe Purge Data:
Purge out of Service : ☐ Yes ☐ No
Purge from : _____
Purge to : _____
Purging Medium : ☐ Air ☐ Nitrogen
Final Gas Reading : _____
Resp. Person : _____
print name
Notes: _____

Revisions		
No.	Date	Reason
1	7/16/2020	ADDED ADDITIONAL TREE NOTES AND TREE PROTECTION

Safety Sector: 00605	ADC Map: VAAR5647F1
Quad Map: L0035W	Tax Map Page: V0001
Scale: 1" = 25' / Plane: VA 83	WMIS Permit No. 898507
Drawn by: (ENE) MJJ / Phone: (443) 577 3284	Date: 10/23/2019
Checked by: (ENE) DON SRISUKWATTANANAN	Date: 01/06/2020
WR / WO Number: 3553640 MNRPL	

ARLINGTON COUNTY, VA
VA SAVE PROGRAM 2
MAIN REPLACEMENT
N HIGHLAND ST
ARLINGTON, VIRGINIA

PATH: L:\PROJECT\WGL\191500-19200-93218-WORKING_DRAWINGS-BCA-291006-1TH\BCA-291006.DWG, PLOTTED: 04/20/2011 11:54 AM

Job Status: FOR CONSTRUCTION
Drawing Number: BCA-291006- 3
Sheet Number: 3 OF 11

AS BUILT CHECKLIST

___ PIPE LOCATED

___ ENDS: PERMANENT-LOCATED/LABELED
TIE IN & TEMP DE-LABELED

___ FITTINGS VERIFIED/LOCATED
(TEES, BENDS, VALVES, ETC.)

___ DRY OR GASSED OUT INFO

___ FOOTAGE INSTALLED
MATCHES DPR/FIELD ORDER

MAIN INSTALL METHOD

DIRECT BURIAL INSERTED DIRECT DRILL

TOTAL FOOTAGE INSTALLED

2" _____ 4" _____ 6" _____

8" _____ 12" _____

OTHER: _____

MATERIAL CHECKLIST

	#INSTL'D	SIZE
COUPLING/S		
TEE/S		
VALVE/S		
END CAPS		
90° ELL		
45° ELL		
OTHER:		

PROFILE A
PROPOSED GAS - 1ST ST N - EAST
HORIZONTAL SCALE: 1"= 25'
VERTICAL SCALE: 1"= 5'

MUST FOLLOW TREE PROTECTION GUIDELINES SPECIFIED ON SHEET 11

TYPICAL ELEVATION VIEW

LEGEND:

EXISTING GAS

PROPOSED GAS

RIGHT OF WAY

PROPOSED GAS TO MAINTAIN A MINIMUM OF 1'-0" VERTICAL AND 5'-0" HORIZONTAL CLEARANCE FROM WATER AND SEWER FACILITIES UNLESS OTHERWISE SPECIFIED BY JURISDICTION.

*INVERT UNKNOWN - ASSUMED DEPTH

30 0 30 60 90
1 INCH = 30 FEET
HORIZONTAL SCALE

5 0 5 10 15
1 INCH = 5 FEET
VERTICAL SCALE

COMMONWEALTH OF VIRGINIA
KRAIVIT SRISUKWATTANANAN
LICENSE No. 0402051954
PROFESSIONAL ENGINEER
Dated 5/13/20
Expired 6/30/21
BCA 291006

REMEMBER TO WEAR YOUR PPE.

Washington Gas
A WGL Company
6801 Industrial Road
Springfield, Virginia 22151
Telephone: 703-750-1000

T/I Gassed out Dry

Date: _____

As-built Drawing Pressure Test Data:
WC ID: _____
Span No. _____
Test Press (PSIG):
☐ 90 ☐ 100 ☐ 150 ☐ OTHER _____
Duration (Mins): _____
Medium : ☐ A ☐ N ☐ W
RIP : ☐ Yes ☐ No
Date : _____
Resp. Person : _____ print name
_____ signature
Notes: _____

Observation Data:
WC ID: _____
Point No. _____
Pipe Type: ☐ MN ☐ SVC ☐ H/L
Size: _____
Mat'l : ☐ PLA ☐ WRPD ☐ ____ ☐ STL ☐ CI
Pipe Cover : _____ (inches)
External Corrosion : ☐ YES ☐ NO ☐ N/A
Internal Corrosion : ☐ YES ☐ NO ☐ N/A
Corrosion Type: A B C D E F G H O X
Max Pit Depth : _____ (thousandths)
Coating Condition : _____

Abandonment Pipe Purge Data:
Purge out of Service : ☐ Yes ☐ No
Purge from : _____
Purge to : _____
Purging Medium : ☐ Air ☐ Nitrogen
Final Gas Reading : _____
Resp. Person : _____ print name
Notes: _____

No.	Date	Revisions Reason
1	7/16/2020	ADDED ADDITIONAL TREE NOTES AND TREE PROTECTION

Safety Sector: 00605	ADC Map: VAAR5647F1
Quad Map: L0035W	Tax Map Page: V0001
Scale: 1" = 25' / Plane: VA 83	WMIS Permit No. 898507
Drawn by: (ENE) MJJ / Phone: (443) 577 3284	Date: 10/23/2019
Checked by: (ENE) DON SRISUKWATTANANAN	Date: 01/06/2020
WR / WO Number: 3553640 MNRPL	

ARLINGTON COUNTY, VA

VA SAVE PROGRAM 2
MAIN REPLACEMENT
N HIGHLAND ST
ARLINGTON, VIRGINIA

PATH: \\PROJACS\WGL\11510011\0033-AVOIDING_DRAWINGS\BCA-291006-1TH\BUILT-REDY_DWG, PLOTTED: 4/14/2021 11:15 AM

Job Status: FOR CONSTRUCTION

Drawing Number: BCA-291006- 4

Sheet Number: 4 OF 11

PROFILE B
PROPOSED GAS - 1ST RD N - WEST
HORIZONTAL SCALE: 1"= 25'
VERTICAL SCALE: 1"= 5'

PROFILE C
PROPOSED GAS - 1ST RD N - EAST
HORIZONTAL SCALE: 1"= 25'
VERTICAL SCALE: 1"= 5'

PROFILE D
PROPOSED GAS - 1ST ST N - WEST
HORIZONTAL SCALE: 1"= 25'
VERTICAL SCALE: 1"= 5'

PROFILE E
PROPOSED GAS - 1ST ST N - EAST
HORIZONTAL SCALE: 1"= 25'
VERTICAL SCALE: 1"= 5'

*INVERT UNKNOWN - ASSUMED DEPTH

30 0 30 60 90
1 INCH = 30 FEET
HORIZONTAL SCALE

5 0 5 10 15
1 INCH = 5 FEET
VERTICAL SCALE

AS BUILT CHECKLIST
- ___ PIPE LOCATED
- ___ ENDS: PERMANENT-LOCATED/LABELED TIE IN & TEMP DE-LABELED
- ___ FITTINGS VERIFIED/LOCATED (TEES, BENDS, VALVES, ETC.)
- ___ DRY OR GASSED OUT INFO
- ___ FOOTAGE INSTALLED MATCHES DPR/FIELD ORDER

MAIN INSTALL METHOD
DIRECT BURIAL INSERTED DIRECT DRILL

TOTAL FOOTAGE INSTALLED
2" _____ 4" _____ 6" _____
8" _____ 12" _____
OTHER: _____

MATERIAL CHECKLIST

	#INSTL'D	SIZE
COUPLING/S		
TEE/S		
VALVE/S		
END CAPS		
90° ELL		
45° ELL		
OTHER:		

MUST FOLLOW TREE PROTECTION GUIDELINES SPECIFIED ON SHEET 11

TYPICAL ELEVATION VIEW

LEGEND:
- EXISTING GAS
- PROPOSED GAS
- RIGHT OF WAY

PROPOSED GAS TO MAINTAIN A MINIMUM OF 1'-0" VERTICAL AND 5'-0" HORIZONTAL CLEARANCE FROM WATER AND SEWER FACILITIES UNLESS OTHERWISE SPECIFIED BY JURISDICTION.

KEEP VIRGINIA'S SAFE WITH C.A.R.E! Call Miss Utility @ 811 DIG

REMEMBER TO WEAR YOUR PPE.

Washington Gas
A WGL Company
6801 Industrial Road
Springfield, Virginia 22151
Telephone: 703-750-1000

T/I Gassed out Dry
Date: _____

As-built Drawing Pressure Test Data:
WC ID: _____
Span No. _____
Test Press (PSIG):
☐ 90 ☐ 100 ☐ 150 ☐ OTHER _____
Duration (Mins): _____
Medium : ☐ A ☐ N ☐ W
RIP : ☐ Yes ☐ No
Date : _____
Resp. Person : _____ print name
_____ signature
Notes: _____

Observation Data:
WC ID: _____
Point No. _____
Pipe Type: ☐ MN ☐ SVC ☐ H/L
Size: _____
Mat'l : ☐ PLA ☐ WRPD ☐ ____ ☐ STL ☐ CI
Pipe Cover : _____ (inches)
External Corrosion : ☐ YES ☐ NO ☐ N/A
Internal Corrosion : ☐ YES ☐ NO ☐ N/A
Corrosion Type: A B C D E F G H O X
Max Pit Depth : _____ (thousandths)
Coating Condition : _____

Abandonment Pipe Purge Data:
Purge out of Service : ☐ Yes ☐ No
Purge from : _____
Purge to : _____
Purging Medium : ☐ Air ☐ Nitrogen
Final Gas Reading : _____
Resp. Person : _____ print name
Notes: _____

Revisions		
No.	Date	Reason
1	7/16/2020	ADDED ADDITIONAL TREE NOTES AND TREE PROTECTION

Safety Sector: 00605	ADC Map: VAAR5647F1
Quad Map: L0035W	Tax Map Page: V0001
Scale: 1" = 25' / Plane: VA 83	WMIS Permit No. 898507
Drawn by: (ENE) MJJ / Phone: (443) 577 3284	Date: 10/23/2019
Checked by: (ENE) DON SRISUKWATTANANAN	Date: 01/06/2020
WR / WO Number: 3553640 MNRPL	

ARLINGTON COUNTY, VA

VA SAVE PROGRAM 2
MAIN REPLACEMENT
N HIGHLAND ST
ARLINGTON, VIRGINIA

PATH: \\PROJECTS\WGL\11510\0.1100.8023-WORKING_DRAWINGS\BCA-291006-1THRU11-REV1 DWG PLOTTED: 6/24/2021 11:34 AM

Job Status: FOR CONSTRUCTION
Drawing Number: BCA-291006- 5
Sheet Number: 5 OF 11

DETAIL A
NTS

DETAIL B
NTS

AS BUILT CHECKLIST

___ PIPE LOCATED
___ ENDS: PERMANENT-LOCATED/LABELED
TIE IN & TEMP DE-LABELED
___ FITTINGS VERIFIED/LOCATED
(TEES, BENDS, VALVES, ETC.)
___ DRY OR GASSED OUT INFO
___ FOOTAGE INSTALLED
MATCHES DPR/FIELD ORDER

MAIN INSTALL METHOD

DIRECT BURIAL INSERTED DIRECT DRILL

TOTAL FOOTAGE INSTALLED

2" _____ 4" _____ 6" _____
8" _____ 12" _____
OTHER: _____

MATERIAL CHECKLIST

	#INSTL'D	SIZE
COUPLING/S		
TEE/S		
VALVE/S		
END CAPS		
90° ELL		
45° ELL		
OTHER:		

MUST FOLLOW TREE PROTECTION GUIDELINES SPECIFIED ON SHEET 11

COMMONWEALTH OF VIRGINIA
KRAHVIT SRISUKWATTANANAN
LICENSE No. 0402051954
PROFESSIONAL ENGINEER
Dated 5/13/20
Expired 6/30/21
For BCA 291006

C.A.R.E. Call Miss Utility @ 811 KEEP VIRGINIA SAFE WITH DIG

TYPICAL ELEVATION VIEW

LEGEND:
EXISTING GAS
PROPOSED GAS
RIGHT OF WAY

PROPOSED GAS TO MAINTAIN A MINIMUM OF 1'-0" VERTICAL AND 5'-0" HORIZONTAL CLEARANCE FROM WATER AND SEWER FACILITIES UNLESS OTHERWISE SPECIFIED BY JURISDICTION.

Washington Gas
A WGL Company
6801 Industrial Road
Springfield, Virginia 22151
Telephone: 703-750-1000

T/I Gassed out Dry
Date: _____

As-built Drawing Pressure Test Data:
WC ID: _____
Span No. _____
Test Press (PSIG):
☐ 90 ☐ 100 ☐ 150 ☐ OTHER ____
Duration (Mins): _____
Medium : ☐ A ☐ N ☐ W
RIP : ☐ Yes ☐ No
Date : _____
Resp. Person : _____
print name
signature
Notes: _____

Observation Data:
WC ID: _____
Point No. _____
Pipe Type: ☐ MN ☐ SVC ☐ H/L
Size: _____
Mat'l : ☐ PLA ☐ WRPD ☐ ____ ☐ STL ☐ CI
Pipe Cover : _____ (inches)
External Corrosion : ☐ YES ☐ NO ☐ N/A
Internal Corrosion : ☐ YES ☐ NO ☐ N/A
Corrosion Type: A B C D E F G H O X
Max Pit Depth : _____ (thousandths)
Coating Condition : _____

Abandonment Pipe Purge Data:
Purge out of Service : ☐ Yes ☐ No
Purge from : _____
Purge to : _____
Purging Medium : ☐ Air ☐ Nitrogen
Final Gas Reading : _____
Resp. Person : _____
print name
Notes: _____

Revisions		
No.	Date	Reason
1	7/16/2020	ADDED ADDITIONAL TREE NOTES AND TREE PROTECTION

Safety Sector: 00605	ADC Map: VAAR5647F1
Quad Map: L0035W	Tax Map Page: V0001
Scale: 1" = 25' / Plane: VA 83	WMIS Permit No. 898507
Drawn by: (ENE) MJJ / Phone: (443) 577 3284	Date: 10/23/2019
Checked by: (ENE) DON SRISUKWATTANANAN	Date: 01/06/2020
WR / WO Number: 3553640 MNRPL	

REMEMBER TO WEAR YOUR PPE.

ARLINGTON COUNTY, VA
VA SAVE PROGRAM 2
MAIN REPLACEMENT
N HIGHLAND ST
ARLINGTON, VIRGINIA

PATH: \\PROJECTS\WGL\1181005\1008\0023-AVOIANG_DRAWINGS\BCA-291006-1TH\BUILT-REDY.DWG, PLOTTED: 4/4/2019 11:15 AM

Job Status: FOR CONSTRUCTION
Drawing Number: BCA-291006- 6
Sheet Number: 6 OF 11

MUST FOLLOW TREE PROTECTION GUIDELINES SPECIFIED ON SHEET 11

AS BUILT CHECKLIST

___ PIPE LOCATED

___ ENDS: PERMANENT-LOCATED/LABELED
TIE IN & TEMP DE-LABELED

___ FITTINGS VERIFIED/LOCATED
(TEES, BENDS, VALVES, ETC.)

___ DRY OR GASSED OUT INFO

___ FOOTAGE INSTALLED
MATCHES DPR/FIELD ORDER

MAIN INSTALL METHOD

DIRECT BURIAL INSERTED DIRECT DRILL

TOTAL FOOTAGE INSTALLED

2" _____ 4" _____ 6" _____

8" _____ 12" _____

OTHER: _____

MATERIAL CHECKLIST

	#INSTL'D	SIZE
COUPLING/S		
TEE/S		
VALVE/S		
END CAPS		
90° ELL		
45° ELL		
OTHER:		

Washington Gas
A WGL Company
6801 Industrial Road
Springfield, Virginia 22151
Telephone: 703-750-1000

T/I Gassed out Dry

Date: _____

As-built Drawing Pressure Test Data:
WC ID: _____
Span No. _____
Test Press (PSIG):
☐ 90 ☐ 100 ☐ 150 ☐ OTHER _____
Duration (Mins): _____
Medium : ☐ A ☐ N ☐ W
RIP : ☐ Yes ☐ No
Date : _____
Resp. Person : _____
print name
signature
Notes: _____

Observation Data:
WC ID: _____
Point No. _____
Pipe Type: ☐ MN ☐ SVC ☐ H/L
Size: _____
Mat'l : ☐ PLA ☐ WRPD ☐ ____
☐ STL ☐ CI
Pipe Cover : _____ (inches)
External Corrosion : ☐ YES ☐ NO ☐ UN/A
Internal Corrosion : ☐ YES ☐ NO ☐ UN/A
Corrosion Type: A B C D E
F G H O X
Max Pit Depth : _____ (thousandths)
Coating Condition : _____

Abandonment Pipe Purge Data:
Purge out of Service : ☐ Yes ☐ No
Purge from : _____
Purge to : _____
Purging Medium : ☐ Air ☐ Nitrogen
Final Gas Reading : _____
Resp. Person : _____
print name
Notes: _____

REMEMBER TO WEAR YOUR PPE.

No.	Date	Reason
1	7/16/2020	ADDED ADDITIONAL TREE & WATER AND TREE PROTECTION

Revisions

Safety Sector: 00605	ADC Map: VAAR5647F1
Quad Map: L0035W	Tax Map Page: V0001
Scale: 1" = 25' / Plane: VA 83	WMIS Permit No. 898507
Drawn by: (ENE) MJJ / Phone: (443) 577 3284	Date: 10/23/2019
Checked by: (ENE) DON SRISUKWATTANANAN	Date: 01/06/2020
WR / WO Number: 3553640 MNRPL	

ARLINGTON COUNTY, VA

VA SAVE PROGRAM 2
MAIN REPLACEMENT
N HIGHLAND ST
ARLINGTON, VIRGINIA

PATH: U:\PROJECT\WGL\191500\19228-WORKING_DRAWINGS-BCA-291006\TH\RUTHERFORD\7.DWG, PLOTTED: 6/4/2021 11:14 AM

Job Status: FOR CONSTRUCTION

Drawing Number: BCA-291006- 7

Sheet Number: 7 OF 11

COMMONWEALTH OF VIRGINIA
ERAPHIT SRISUKWATTANANAN
LICENSE No. 0402051954
PROFESSIONAL ENGINEER
Dated 5/13/20
Expired 6/30/21
BCA 291006

25 0 25 50 75
1 INCH = 25 FEET

TYPICAL ELEVATION VIEW

LEGEND:

EXISTING GAS

PROPOSED GAS

RIGHT OF WAY

PROPOSED GAS TO MAINTAIN A MINIMUM OF 1'-0" VERTICAL AND 5'-0" HORIZONTAL CLEARANCE FROM WATER AND SEWER FACILITIES UNLESS OTHERWISE SPECIFIED BY JURISDICTION.

DIG WITH C.A.R.E. Call Miss Utility @ 811 KEEP VIRGINIA'S SAFE

Piping System Integrity Analysis (PSIA)

Project Description						Pipe Size, Type, Pressure and Footage						
Project Name:	VA SAVE 2 - N HIGHLAND ST - ARL - Z264						Exist	Exist	Exist	Exist	Exist	Exist
						Size / Type	2" WRPD-	2" PLA-				
BCA #	291006	Revision #		Quad:	L003SW	Pressure	20#	20#				
Project Manager:		Michael P Stablein		Date:	10/30/2019	Length	550	20				
Analysis Requested for:						**Estimated Constuction Temperature:**						
		Repl Main & By-Pass Sizing				5 Degree	30 Degree		65 Degree			

OFFSET APPROXIMATELY 550' OF 2" WRPD-20# (1966) TO REMEDIATE WATERMAIN CONFLICTS.

Comments/ Requests:

Please provide main sizing and feeds indicated below.

1-29-2020(MPS): Please provide replacement main sizing in highlighted fields below.

System Planning Analysis for: BCA # 291006				Model (Temperature)					
SP Analyst: Jon Patno Ext 7-4339, FFX		Date: 11/5/2019		5 Degree		30 Degree		65 Degree	
Street Name / Location	Exist Main Size/ Type/ Pres	Repl Main Size/ Type/ Pres	Exist Feed	Flow (mcfh)	By-Pass Size	Flow (mcfh)	By-Pass Size	Flow (mcfh)	By-Pass Size
N Highland St	2" WRPD- 20#	2" PLA- 20#	2 way		None		None		None
1st St N (west of N Highland St)	2" WRPD- 20#	2" PLA- 20#	2 way		None		None		None
1st St N (east of N Highland St)	2" PLA- 20#	2" PLA- 20#	2 way		None		None		None
1st Rd N (west of N Highland St)	2" WRPD- 20#	2" PLA- 20#	1 way	0.5	3/4"	0.3	3/4"	0.01	3/4"
1st Rd N (east of N Highland St)	2" WRPD- 20#	2" PLA- 20#	1 way	0.09	3/4"	0.05	3/4"	0.01	3/4"

System Planning Comments:

A System Planning review is required if construction does not start within 6 months from the above date.

The 2" WRPD-20# main on N Highland St is a 2-way feed and does not require a bypass. The 2" WRPD-20# mains on 1st St N (west of N Highland St), 1st Rd N (west of N Highland St), and 1st Rd N (east of N Highland St) and the 2" PLA-20# main on 1st St N (east of N Highland St) are 1-way feeds and require a bypass. 1/29/20 - replacement size added. All other initial analysis is still valid. JP.

CONSTRUCTION MUST CONFIRM THAT THE APPROVED PSIA HAS NOT EXPIRED PRIOR TO THE START OF CONSTRUCTION. IF THE APPROVED PSIA HAS EXPIRED (CONSTRUCTION TO START MORE THAN 6 MONTHS AFTER THE PSIA WAS REVIEWED), AN UPDATED PSIA MUST BE REVIEWED AND APPROVED BY SYSTEM PLANNING BEFORE CONSTRUCTION MAY BEGIN

MUST FOLLOW TREE PROTECTION GUIDELINES SPECIFIED ON SHEET 11

COMMONWEALTH OF VIRGINIA
EPAPHIT SRISUKWATTANANAN
LICENSE No. 0402051954
PROFESSIONAL ENGINEER
Dated 5/13/20
Expired 6/30/21
BCA 291006

REMEMBER TO WEAR YOUR PPE.

Washington Gas
A WGL Company
6801 Industrial Road
Springfield, Virginia 22151
Telephone: 703-750-1000

T/I Gassed out Dry
Date:

As-built Drawing Pressure Test Data:
WC ID:
Span No.
Test Press (PSIG): ☐ 90 ☐ 100 ☐ 150 ☐ OTHER
Duration (Mins):
Medium : ☐ A ☐ N ☐ W
RIP : ☐ Yes ☐ No
Date :
Resp. Person : print name
signature
Notes:

Observation Data:
WC ID:
Point No.
Pipe Type: ☐ MN ☐ SVC ☐ H/L
Size:
Mat'l : ☐ PLA ☐ WRPD ☐ ____ ☐ STL ☐ CI
Pipe Cover : (inches)
External Corrosion : ☐ YES ☐ NO ☐ N/A
Internal Corrosion : ☐ YES ☐ NO ☐ N/A
Corrosion Type: A B C D E F G H O X
Max Pit Depth : (thousandths)
Coating Condition :

Abandonment Pipe Purge Data:
Purge out of Service : ☐ Yes ☐ No
Purge from :
Purge to :
Purging Medium : ☐ Air ☐ Nitrogen
Final Gas Reading :
Resp. Person : print name
Notes:

No.	Date	Reason
1	7/16/2020	ADDED ADDITIONAL TREE NOTES AND TREE PROTECTION

Safety Sector: 00605
ADC Map: VAAR5647F1
Quad Map: L0035W
Tax Map Page: V0001
Scale: 1" = 25'
Plane: VA 83
WMIS Permit No. 898507
Drawn by: (ENE) MJJ
Phone: (443) 577 3284
Date: 10/23/2019
Checked by: (ENE) DON SRISUKWATTANANAN
Date: 01/06/2020
WR / WO Number: 3553640 MNRPL

ARLINGTON COUNTY, VA
VA SAVE PROGRAM 2
MAIN REPLACEMENT
N HIGHLAND ST
ARLINGTON, VIRGINIA

PATH: \\PROJECTS\PROJ\11\11000\11000-9023-WORKING_DRAWINGS\BCA-291006-1TH\01-REDY DWG PLOTTED: 6/4/2021 11:34 AM

Job Status: FOR CONSTRUCTION
Drawing Number: BCA-291006- 8
Sheet Number: 8 OF 11

BCA# 291006

Project Name: VA SAVE 2 - N HIGHLAND ST - ARL - Z264

PSIA Replacement Request Plot

11" X 17' PLOT

Project Overview

OFFSET APPROXIMATELY 550' OF 2" WRPD-20# (1966) TO REMEDIATE WATERMAIN CONFLICTS.

Comments/ Requests:

Please provide main sizing and feeds indicated below.
1-29-2020(MPS): Please provide replacement main sizing in highlighted fields below.

MUST FOLLOW TREE PROTECTION GUIDELINES SPECIFIED ON SHEET 11

KRAIVIT SRISUKWATTANANAN LICENSE No. 0402031954 COMMONWEALTH OF VIRGINIA PROFESSIONAL ENGINEER
Dated 5/13/20
Expired 6/30/21
For BCA 291006

CONSTRUCTION MUST CONFIRM THAT THE APPROVED PSIA HAS NOT EXPIRED PRIOR TO THE START OF CONSTRUCTION. IF THE APPROVED PSIA HAS EXPIRED (CONSTRUCTION TO START MORE THAN 6 MONTHS AFTER THE PSIA WAS REVIEWED), AN UPDATED PSIA MUST BE REVIEWED AND APPROVED BY SYSTEM PLANNING BEFORE CONSTRUCTION MAY BEGIN

REMEMBER TO WEAR YOUR PPE.

Washington Gas
A WGL Company
6801 Industrial Road
Springfield, Virginia 22151
Telephone: 703-750-1000

T/I Gassed out Dry
Date: _____

As-built Drawing Pressure Test Data:
WC ID: _____
Span No. _____
Test Press (PSIG):
☐ 90 ☐ 100 ☐ 150 ☐ OTHER _____
Duration (Mins): _____
Medium : ☐A ☐N ☐W
RIP : ☐ Yes ☐ No
Date : _____
Resp. Person : _____ (print name)
_____ (signature)
Notes: _____

Observation Data:
WC ID: _____
Point No. _____
Pipe Type: ☐MN ☐SVC ☐H/L
Size: _____
Mat'l : ☐PLA ☐WRPD ☐____ ☐STL ☐CI
Pipe Cover : _____ (inches)
External Corrosion : ☐YES ☐NO ☐N/A
Internal Corrosion : ☐YES ☐NO ☐N/A
Corrosion Type: A B C D E F G H O X
Max Pit Depth : _____(thousandths)
Coating Condition : _____

Abandonment Pipe Purge Data:
Purge out of Service : ☐Yes ☐No
Purge from : _____
Purge to : _____
Purging Medium : ☐Air ☐Nitrogen
Final Gas Reading : _____
Resp. Person : _____ (print name)
Notes: _____

Revisions		
No.	Date	Reason
1	7/16/2020	ADDED ADDITIONAL TREE NOTES AND TREE PROTECTION

Safety Sector: 00605	ADC Map: VAAR5647F1
Quad Map: L0035W	Tax Map Page: V0001
Scale: 1" = 25' / Plane: VA 83	WMIS Permit No. 898507
Drawn by: (ENE) MJJ / Phone: (443) 577 3284	Date: 10/23/2019
Checked by: (ENE) DON SRISUKWATTANANAN	Date: 01/06/2020
WR / WO Number: 3553640 MNRPL	

ARLINGTON COUNTY, VA

VA SAVE PROGRAM 2
MAIN REPLACEMENT
N HIGHLAND ST
ARLINGTON, VIRGINIA

PATH: \\PROJECTS\WGL\191005\1500\9229-WVGNVA_DRAWINGS\BCA-291006-1TRIG\1\BCA-291006.DWG, PLOTTED: 6/4/2019 11:15 AM

Job Status: FOR CONSTRUCTION

Drawing Number: BCA-291006- 9

Sheet Number: 9 OF 11

BCA# 291006 | **Project Name: VA SAVE 2 - N HIGHLAND ST - ARL - Z264**

System Planning SynerGEE Plot

Legend:

- 2"
- 4"
- 6"
- 8"
- 12" PLA
- 12" WRPD
- 16"

11" X 17" Plot

Additional Comments:

MUST FOLLOW TREE PROTECTION GUIDELINES SPECIFIED ON SHEET 11

COMMONWEALTH OF VIRGINIA
KRAIVIT SRISUKWATTANANAN
LICENSE No. 0402031954
PROFESSIONAL ENGINEER
Dated 5/13/20
Expired 6/30/21
For BCA 291006

CONSTRUCTION MUST CONFIRM THAT THE APPROVED PSIA HAS NOT EXPIRED PRIOR TO THE START OF CONSTRUCTION. IF THE APPROVED PSIA HAS EXPIRED (CONSTRUCTION TO START MORE THAN 6 MONTHS AFTER THE PSIA WAS REVIEWED), AN UPDATED PSIA MUST BE REVIEWED AND APPROVED BY SYSTEM PLANNING BEFORE CONSTRUCTION MAY BEGIN

REMEMBER TO WEAR YOUR PPE.

Washington Gas
A WGL Company
6801 Industrial Road
Springfield, Virginia 22151
Telephone: 703-750-1000

T/I Gassed out Dry
Date: _____

As-built Drawing Pressure Test Data:
WC ID: _____
Span No. _____
Test Press (PSIG):
☐ 90 ☐ 100 ☐ 150 ☐ OTHER ____
Duration (Mins): _____
Medium : ☐ A ☐ N ☐ W
RIP : ☐ Yes ☐ No
Date : _____
Resp. Person : _____ (print name)
_____ (signature)
Notes: _____

Observation Data:
WC ID: _____
Point No. _____
Pipe Type: ☐ MN ☐ SVC ☐ H/L
Size: _____
Mat'l : ☐ PLA ☐ WRPD ☐ ____ ☐ STL ☐ CI
Pipe Cover : _____ (inches)
External Corrosion : ☐ YES ☐ NO ☐ N/A
Internal Corrosion : ☐ YES ☐ NO ☐ N/A
Corrosion Type: A B C D E F G H O X
Max Pit Depth : _____ (thousandths)
Coating Condition : _____

Abandonment Pipe Purge Data:
Purge out of Service : ☐ Yes ☐ No
Purge from : _____
Purge to : _____
Purging Medium : ☐ Air ☐ Nitrogen
Final Gas Reading : _____
Resp. Person : _____ (print name)
Notes: _____

Revisions		
No.	Date	Reason
1	7/16/2020	ADDED ADDITIONAL TREE NOTES AND TREE PROTECTION

Safety Sector: 00605	ADC Map: VAAR5647F1
Quad Map: L0035W	Tax Map Page: V0001
Scale: 1" = 25' / Plane: VA 83	WMIS Permit No. 898507
Drawn by: (ENE) MJJ / Phone: (443) 577 3284	Date: 10/23/2019
Checked by: (ENE) DON SRISUKWATTANANAN	Date: 01/06/2020
WR / WO Number: 3553640 MNRPL	

ARLINGTON COUNTY, VA

VA SAVE PROGRAM 2
MAIN REPLACEMENT
N HIGHLAND ST
ARLINGTON, VIRGINIA

PATH: U:\PROJECTS\WGL\191005\10005\0028-WORKING_DRAWINGS-BCA-291006-1TH\BUILD\BCA-291006-1TH-BUILD.DWG, PLOTTED: 04/20/2011 11:14 AM

Job Status: **FOR CONSTRUCTION**

Drawing Number: **BCA-291006-10**

Sheet Number: **10 OF 11**

NOTES:

1. GRAPHICALLY, THE CRITICAL ROOT ZONE (CRZ) IS REPRESENTED AS A CIRCULAR REGION MEASURED OUTWARD FROM A TREE TRUNK REPRESENTING THE AREA OF ROOTS THAT MUST BE MAINTAINED OR PROTECTED FOR THE TREE'S SURVIVAL.

2. THE CRZ OF A TREE IS THE ZONE IN WHICH THE MAJORITY OF THE ROOTS LAY. 95% OF THE ROOTS OF MOST TREES WILL BE FOUND IN THE UPPER 12-18" OF THE SOIL. MOST OF THE ROOTS THAT SUPPLY THE NUTRIENTS AND WATER TO THE TREE ARE FOUND JUST BELOW THE SOIL SURFACE. THE TOTAL AMOUNT OF A TREE'S ROOTS ARE GENERALLY PROPORTIONAL TO THE VOLUME OF THE TREE'S CANOPY. THEREFORE, IF THE ROOTS ONLY PENETRATE A THIN LAYER OF SOIL, THEN THE ROOTS MUST SPREAD FAR FROM THE TREE, BEYOND THE EXTENSION OF THE CANOPY.

3. PLOT ACCURATE TRUNK LOCATIONS OF ALL TREES GREATER THAN 3" DIAMETER AT BREAST HEIGHT (DBH) AND/OR TREE STANDS WITHIN DEVELOPMENT AREAS ON ALL PLANS FOR THE PROJECT AND DELINEATE THEIR ESTIMATED CRITICAL ROOT ZONE.

4. PLOT ACCURATE TRUNK LOCATIONS OF OFFSITE TREES WHICH WILL HAVE THEIR CRZ AFFECTED BY DEVELOPMENT AND DELINEATE THEIR ESTIMATED CRITICAL ROOT ZONE.

TREE PROTECTION DETAIL FOR DETERMINING CRITICAL ROOT ZONE N.T.S.

311300.3 (2019)

ARLINGTON VIRGINIA DPR

NOTE:
1. EXACT RPM DIMENSIONS TO BE DETERMINED BY PROJECT ARBORIST
2. ARBORIST TO COORDINATE WITH SITE SUPERINTENDENT FOR PIPE LAYOUT, DEPTH,SIZE OF EQUIPMENT, WIDTH OF TRENCH, AND OVERDIG TO DETERMINE LOCATION AND LAYOUT OF TREE PROTECTION.
3. ARBORIST TO COORDINATE WITH SITE SUPERINTENDENT FOR OVERHEAD CLEARANCE ISSUES. MAY REQUIRE SELECT PRUNING OR TEMPORARY GUYING.
4. ARBORIST TO MONITOR BACK FILL AND RESTORATION ADJACENT TO PROTECTED TREES.

TREE PROTECTION FOR UNDERGROUND UTILITY N.T.S.

311300.19NS (2019)

ARLINGTON VIRGINIA DPR

TREE PROTECTION FOR UNDERGROUND UTILITY N.T.S.

311300.20NS (2019)

ARLINGTON VIRGINIA DPR

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COMMONWEALTH OF VIRGINIA
KRAIVIT SRISUKWATTANANAN
LICENSE No. 0402031954
PROFESSIONAL ENGINEER
Dated 5/13/20
Expired 6/30/21
For BCA 291006

REMEMBER TO WEAR YOUR PPE.

Washington Gas
A WGL Company
6801 Industrial Road
Springfield, Virginia 22151
Telephone: 703-750-1000

T/I Gassed out Dry

Date: _____

As-built Drawing Pressure Test Data:
WC ID: _____
Span No. _____
Test Press (PSIG):
☐ 90 ☐ 100 ☐ 150 ☐ OTHER _____
Duration (Mins): _____
Medium : ☐ A ☐ N ☐ W
RIP : ☐ Yes ☐ No
Date : _____
Resp. Person : _____ print name
_____ signature
Notes: _____

Observation Data:
WC ID: _____
Point No. _____
Pipe Type: ☐ MN ☐ SVC ☐ H/L
Size: _____
Mat'l : ☐ PLA ☐ WRPD ☐ ____ ☐ STL ☐ CI
Pipe Cover : _____ (inches)
External Corrosion : ☐ YES ☐ NO ☐ N/A
Internal Corrosion : ☐ YES ☐ NO ☐ N/A
Corrosion Type: A B C D E F G H O X
Max Pit Depth : _____ (thousandths)
Coating Condition : _____

Abandonment Pipe Purge Data:
Purge out of Service : ☐ Yes ☐ No
Purge from : _____
Purge to : _____
Purging Medium : ☐ Air ☐ Nitrogen
Final Gas Reading : _____
Resp. Person : _____ print name
Notes: _____

Revisions

No.	Date	Reason
1	7/16/2020	ADDED ADDITIONAL TREE NOTES AND TREE PROTECTION

Safety Sector: 00605	ADC Map: VAAR5647F1
Quad Map: L0035W	Tax Map Page: V0001
Scale: 1" = 25' / Plane: VA 83	WMIS Permit No. 898507
Drawn by: (ENE) MJJ / Phone: (443) 577 3284	Date: 10/23/2019
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WR / WO Number: 3553640 MNRPL	

ARLINGTON COUNTY, VA

VA SAVE PROGRAM 2
MAIN REPLACEMENT
N HIGHLAND ST
ARLINGTON, VIRGINIA

PATH: U:\PROJECT DWG\1191001\1001\0023\-WORKING_DRAWINGS-BCA-291006-1TH\01\BA01.DWG PLOTTED: 04/20/2011 11:34 AM

Job Status: FOR CONSTRUCTION

Drawing Number: BCA-291006-11

Sheet Number: 11 OF 11

TEST HOLE FORM

MID-ATLANTIC UTILITY LOCATING, L.L.C.

rover — MID-ATLANTIC UTILITY LOCATING's MOBILE FIELD DATA REPORTING

44200 WAXPOOL RD, SUITE 127 ASHBURN, VA 20147 | 703.378.0100 | WWW.MIDATLANTICLOCATING.COM

Project: M-0618-0201-Z261 (N. Highlands St.)	**Prepared By:** Chris Lugiano	**Date:** 2019-11-05
City: Arlington	**State:** VA	**Test Hole:** 1 of
General Location: 116 N. Highland St.		

UTILITY INFORMATION

Utility Size: 24"	**Material:** Rough Pour Concrete	**Good Condition:** YES
Utility Type: Communication Ductbank		**Utility Owner:** AT&T

ADDITIONAL UTILITY INFORMATION

Utility Size:	**Material:**	**See Test Hole No.:**
Utility Type: None		**Utility Owner:**

SITE CONDITIONS

Field Condition: Grass	**Pavement thickness:**
Ground Condition: Brown Soil/ Roots	

FIRST & SECOND BENCHMARK INFORMATION

1st Elevation:	**1st Benchmark Description:**
BM Check:	
2nd Elevation:	**2nd Benchmark Description:**
Elevation Datum:	

FIELD MARKER INFORMATION

Type set: Wooden Hub	**Elevation:** 260.03'
Offset/Direction: Hub is set C/L of the Utility.	

PROFILE VIEW

Top of utility field measurement: 5.24' **Elevation:** 254.79'

Bottom of utility field measurement: 7.01' **Elevation:** 253.02'

Facing: South **Utility Width/Spacing:**

PLAN VIEW

COORDINATES

Northing: 7004834.9309 **Easting:** 11883482.1818

COMMENTS/NOTES

Crew notes duct is damaged and conduits are exposed in test hole.

TEST HOLE FORM

MID-ATLANTIC UTILITY LOCATING, L.L.C.

rover — MID-ATLANTIC UTILITY LOCATING's MOBILE FIELD DATA REPORTING

44200 WAXPOOL RD, SUITE 127 ASHBURN, VA 20147 | 703.378.0100 | WWW.MIDATLANTICLOCATING.COM

Project: M-0618-0201-Z261 (N. Highlands St.)	**Prepared By:** Chris Lugiano	**Date:** 2019-11-04
City: Arlington	**State:** VA	**Test Hole:** 2 of
General Location: 102 N. Highland St.		

UTILITY INFORMATION

Utility Size: Clear Hole	**Material:**	**Good Condition:** YES
Utility Type: None		**Utility Owner:**

ADDITIONAL UTILITY INFORMATION

Utility Size:	**Material:**	**See Test Hole No.:**
Utility Type: None		**Utility Owner:**

SITE CONDITIONS

Field Condition: Asphalt	**Pavement thickness:** 5"
Ground Condition: Wet Brown Soil	

FIRST & SECOND BENCHMARK INFORMATION

1st Elevation:	**1st Benchmark Description:**
BM Check:	
2nd Elevation:	**2nd Benchmark Description:**
Elevation Datum:	

FIELD MARKER INFORMATION

Type set: Mag Nail	**Elevation:** 259.42'
Offset/Direction: Nail is set C/L of the Utility.	

PROFILE VIEW

Top of utility field measurement: 6.00' **Elevation:** 253.42'

Bottom of utility field measurement: None **Elevation:** None

Facing: South **Utility Width/Spacing:**

PLAN VIEW

COORDINATES

Northing: 7004633.5653 **Easting:** 11883555.4916

COMMENTS/NOTES

TEST HOLE FORM

MID-ATLANTIC UTILITY LOCATING, L.L.C.

rover — MID-ATLANTIC UTILITY LOCATING's MOBILE FIELD DATA REPORTING

44200 WAXPOOL RD, SUITE 127 ASHBURN, VA 20147 | 703.378.0100 | WWW.MIDATLANTICLOCATING.COM

Project: M-0618-0201-Z261 (N. Highlands St.)	**Prepared By:** Chris Lugiano	**Date:** 2019-11-04
City: Arlington	**State:** VA	**Test Hole:** 3 of
General Location: 102 N. Highland St.		

UTILITY INFORMATION

Utility Size: 24"	**Material:** Rough Pour Concrete	**Good Condition:** YES
Utility Type: Communication Ductbank		**Utility Owner:** AT&T

ADDITIONAL UTILITY INFORMATION

Utility Size:	**Material:**	**See Test Hole No.:**
Utility Type: None		**Utility Owner:**

SITE CONDITIONS

Field Condition: Asphalt	**Pavement thickness:** 5"
Ground Condition: Wet Brown Soil	

FIRST & SECOND BENCHMARK INFORMATION

1st Elevation:	**1st Benchmark Description:**
BM Check:	
2nd Elevation:	**2nd Benchmark Description:**
Elevation Datum:	

FIELD MARKER INFORMATION

Type set: Mag Nail	**Elevation:** 259.01'
Offset/Direction: Nail is set C/L of the Utility.	

PROFILE VIEW

Top of utility field measurement: 4.01' **Elevation:** 255.00'

Bottom of utility field measurement: 6.29' **Elevation:** 252.72'

Facing: South **Utility Width/Spacing:**

PLAN VIEW

COORDINATES

Northing: 7004621.5691 **Easting:** 11883551.8592

COMMENTS/NOTES

TEST HOLE FORM

MID-ATLANTIC UTILITY LOCATING, L.L.C.

rover — MID-ATLANTIC UTILITY LOCATING's MOBILE FIELD DATA REPORTING

44200 WAXPOOL RD, SUITE 127 ASHBURN, VA 20147 | 703.378.0100 | WWW.MIDATLANTICLOCATING.COM

Project: M-0618-0201-Z261 (N. Highlands St.)	**Prepared By:** Chris Lugiano	**Date:** 2019-11-11
City: Arlington	**State:** VA	**Test Hole:** 4 of
General Location: 38 N. Highland St.		

UTILITY INFORMATION

Utility Size: 30"	**Material:** Rough Pour Concrete	**Good Condition:** YES
Utility Type: Communication Ductbank		**Utility Owner:** AT&T

ADDITIONAL UTILITY INFORMATION

Utility Size:	**Material:**	**See Test Hole No.:**
Utility Type: None		**Utility Owner:**

SITE CONDITIONS

Field Condition: Asphalt	**Pavement thickness:** 5"
Ground Condition: Wet Brown Soil	

FIRST & SECOND BENCHMARK INFORMATION

1st Elevation:	**1st Benchmark Description:**
BM Check:	
2nd Elevation:	**2nd Benchmark Description:**
Elevation Datum:	

FIELD MARKER INFORMATION

Type set: Mag Nail	**Elevation:** 255.15'
Offset/Direction: Nail is set C/L of the Utility.	

PROFILE VIEW

Top of utility field measurement: 4.24' **Elevation:** 250.91'

Bottom of utility field measurement: 8.56' **Elevation:** 246.59'

Facing: South **Utility Width/Spacing:**

PLAN VIEW

COORDINATES

Northing: 7004475.1559 **Easting:** 11883601.9681

COMMENTS/NOTES

TEST HOLE FORM

MID-ATLANTIC UTILITY LOCATING, L.L.C.

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Project: M-0618-0201-Z261 (N. Highlands St.)	**Prepared By:** Chris Lugiano	**Date:** 2019-11-08
City: Arlington	**State:** VA	**Test Hole:** 5 of
General Location: 102 N. Highland St.		

UTILITY INFORMATION

Utility Size: 33"	**Material:** Rough Pour Concrete	**Good Condition:** YES
Utility Type: Communication Ductbank		**Utility Owner:** AT&T

ADDITIONAL UTILITY INFORMATION

Utility Size: 4 1/2"	**Material:** Cast Iron	**See Test Hole No.:**
Utility Type: Water Line		**Utility Owner:**

SITE CONDITIONS

Field Condition: Asphalt	**Pavement thickness:** 5"
Ground Condition: Wet Brown Soil	

FIRST & SECOND BENCHMARK INFORMATION

1st Elevation:	**1st Benchmark Description:**
BM Check:	
2nd Elevation:	**2nd Benchmark Description:**
Elevation Datum:	

FIELD MARKER INFORMATION

Type set: Mag Nail	**Elevation:** 253.57'
Offset/Direction: Nail is set C/L of the Utility.	

PROFILE VIEW

Top of utility field measurement: 4.31' **Elevation:** 249.26'

Bottom of utility field measurement: 9.04' **Elevation:** 244.53'

Facing: South **Utility Width/Spacing:** 39"

PLAN VIEW

COORDINATES

Northing: 7004425.2266 **Easting:** 11883618.5936

COMMENTS/NOTES

TEST HOLE FORM

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Project: M-0618-0201-Z261 (N. Highlands St.)	**Prepared By:** Chris Lugiano	**Date:** 2019-11-11
City: Arlington	**State:** VA	**Test Hole:** 6 of
General Location: 20 N. Highland St.		

UTILITY INFORMATION

Utility Size: 30"	**Material:** Rough Pour Concrete	**Good Condition:** YES
Utility Type: Communication Ductbank		**Utility Owner:** AT&T

ADDITIONAL UTILITY INFORMATION

Utility Size:	**Material:**	**See Test Hole No.:**
Utility Type: None		**Utility Owner:**

SITE CONDITIONS

Field Condition: Asphalt	**Pavement thickness:** 5"
Ground Condition: Wet Brown Soil	

FIRST & SECOND BENCHMARK INFORMATION

1st Elevation:	**1st Benchmark Description:**
BM Check:	
2nd Elevation:	**2nd Benchmark Description:**
Elevation Datum:	

FIELD MARKER INFORMATION

Type set: Mag Nail	**Elevation:** 249.58'
Offset/Direction: Nail is set C/L of the Utility.	

PROFILE VIEW

Top of utility field measurement: 5.16' **Elevation:** 244.42'

Bottom of utility field measurement: 8.99' **Elevation:** 240.59'

Facing: South **Utility Width/Spacing:**

PLAN VIEW

COORDINATES

Northing: 7004308.0523 **Easting:** 11883658.0420

COMMENTS/NOTES

TEST HOLE FORM

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Project: M-0618-0201-Z261 (N. Highlands St.)	**Prepared By:** Chris Lugiano	**Date:** 2019-11-06
City: Arlington	**State:** VA	**Test Hole:** 9 (NEW) of
General Location: N. Highland St.		

UTILITY INFORMATION

Utility Size: 2 1/2"	**Material:** Steel	**Good Condition:** YES
Utility Type: Gas Line		**Utility Owner:** Washington Gas

ADDITIONAL UTILITY INFORMATION

Utility Size:	**Material:**	**See Test Hole No.:**
Utility Type: None		**Utility Owner:**

SITE CONDITIONS

Field Condition: Asphalt	**Pavement thickness:** 9"
Ground Condition: Wet Brown Soil	

FIRST & SECOND BENCHMARK INFORMATION

1st Elevation:	**1st Benchmark Description:**
BM Check:	
2nd Elevation:	**2nd Benchmark Description:**
Elevation Datum:	

FIELD MARKER INFORMATION

Type set: Mag Nail	**Elevation:** 257.81'
Offset/Direction: Nail is set C/L of the Utility.	

PROFILE VIEW

Top of utility field measurement: 4.93' **Elevation:** 252.88'

Bottom of utility field measurement: None **Elevation:** None

Facing: North **Utility Width/Spacing:**

PLAN VIEW

COORDINATES

Northing: 7004880.4917 **Easting:** 11883469.3699

COMMENTS/NOTES

TEST HOLE FORM

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Project: M-0618-0201-Z261 (N. Highlands St.)	**Prepared By:** Chris Lugiano	**Date:** 2019-11-05
City: Arlington	**State:** VA	**Test Hole:** 13 (NEW) of
General Location: N. Highland St.		

UTILITY INFORMATION

Utility Size: 2 1/2"	**Material:** Steel	**Good Condition:** YES
Utility Type: Gas Line		**Utility Owner:** Washington Gas

ADDITIONAL UTILITY INFORMATION

Utility Size:	**Material:**	**See Test Hole No.:**
Utility Type: None		**Utility Owner:**

SITE CONDITIONS

Field Condition: Asphalt	**Pavement thickness:** 9"
Ground Condition: Wet Brown Soil	

FIRST & SECOND BENCHMARK INFORMATION

1st Elevation:	**1st Benchmark Description:**
BM Check:	
2nd Elevation:	**2nd Benchmark Description:**
Elevation Datum:	

FIELD MARKER INFORMATION

Type set: Mag Nail	**Elevation:** 259.65'
Offset/Direction: Nail is set C/L of the Utility.	

PROFILE VIEW

Top of utility field measurement: 4.80' **Elevation:** 254.85'

Bottom of utility field measurement: None **Elevation:** None

Facing: South **Utility Width/Spacing:**

PLAN VIEW

COORDINATES

Northing: 7004836.7866 **Easting:** 11883484.5873

COMMENTS/NOTES

TEST HOLE FORM

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Project: M-0618-0201-R085 (N. Highlands)	**Prepared By:** Chris Lugiano	**Date:** 2019-07-08
City: Arlington	**State:** VA	**Test Hole:** 1 of
General Location: 129 / 133 N. Highland		

UTILITY INFORMATION

Utility Size: 24"	**Material:** Rough Pour Concrete	**Good Condition:** YES
Utility Type: Communication Ductbank		**Utility Owner:**

ADDITIONAL UTILITY INFORMATION

Utility Size:	**Material:**	**See Test Hole No.:**
Utility Type: None		**Utility Owner:**

SITE CONDITIONS

Field Condition: Asphalt	**Pavement thickness:** 9"
Ground Condition: Brown Soil	

FIRST & SECOND BENCHMARK INFORMATION

1st Elevation:	**1st Benchmark Description:**
BM Check:	
2nd Elevation:	**2nd Benchmark Description:**
Elevation Datum:	

FIELD MARKER INFORMATION

Type set: Mag Nail	**Elevation:** 259.69'
Offset/Direction: Nail is set C/L of the Utility.	

PROFILE VIEW

Top of utility field measurement: 6.90' **Elevation:** 252.79'

Bottom of utility field measurement: 8.07' **Elevation:** 251.62'

Facing: Northwest **Utility Width/Spacing:**

PLAN VIEW

COORDINATES

Northing: 7005050.4752 **Easting:** 11883408.3306

COMMENTS/NOTES

Unable to determine bottom due to ground water and mud cave in.

TEST HOLE FORM

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Project: M-0618-0201-R085 (N. Highlands)	**Prepared By:** Chris Lugiano	**Date:** 2019-07-10
City: Arlington	**State:** VA	**Test Hole:** 2 of
General Location: 129 N. Highland		

UTILITY INFORMATION

Utility Size: 18" Per Record	**Material:** Concrete	**Good Condition:** YES
Utility Type: Storm Line		**Utility Owner:**

ADDITIONAL UTILITY INFORMATION

Utility Size:	**Material:**	**See Test Hole No.:**
Utility Type: None		**Utility Owner:**

SITE CONDITIONS

Field Condition: Asphalt	**Pavement thickness:** 10"
Ground Condition: Brown Soil	

FIRST & SECOND BENCHMARK INFORMATION

1st Elevation:	**1st Benchmark Description:**
BM Check:	
2nd Elevation:	**2nd Benchmark Description:**
Elevation Datum:	

FIELD MARKER INFORMATION

Type set: Mag Nail	**Elevation:** 257.97'
Offset/Direction: Nail is set C/L of the Utility.	

PROFILE VIEW

Top of utility field measurement: 5.50' **Elevation:** 252.47'

Bottom of utility field measurement: None **Elevation:** None

Facing: Northwest **Utility Width/Spacing:**

PLAN VIEW

COORDINATES

Northing: 7005028.5921 **Easting:** 11883417.2068

COMMENTS/NOTES

TEST HOLE FORM

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Project: M-0618-0201-R085 (N. Highlands)	**Prepared By:** Chris Lugiano	**Date:** 2019-07-10
City: Arlington	**State:** VA	**Test Hole:** 3 of
General Location: 129 N. Highland		

UTILITY INFORMATION

Utility Size: MH Lid	**Material:**	**Good Condition:** YES
Utility Type: Storm Manhole		**Utility Owner:**

ADDITIONAL UTILITY INFORMATION

Utility Size:	**Material:**	**See Test Hole No.:**
Utility Type: None		**Utility Owner:**

SITE CONDITIONS

Field Condition: Asphalt	**Pavement thickness:** 9 1/2"
Ground Condition: Brown Soil	

FIRST & SECOND BENCHMARK INFORMATION

1st Elevation:	**1st Benchmark Description:**
BM Check:	
2nd Elevation:	**2nd Benchmark Description:**
Elevation Datum:	

FIELD MARKER INFORMATION

Type set: Mag Nail	**Elevation:** 257.43'
Offset/Direction: Nail is set C/L of the Utility.	

PROFILE VIEW

Top of utility field measurement: 0.75' **Elevation:** 256.68'

Bottom of utility field measurement: None **Elevation:** None

Facing: West **Utility Width/Spacing:**

PLAN VIEW

COORDINATES

Northing: 7005024.5798 **Easting:** 11883418.5045

COMMENTS/NOTES

MH Lid found 0.75' in the ground.

TEST HOLE FORM

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Project: M-0618-0201-R085 (N. Highlands)	**Prepared By:** Chris Lugiano	**Date:** 2019-07-10
City: Arlington	**State:** VA	**Test Hole:** 4 of
General Location: 129 N. Highland		

UTILITY INFORMATION

Utility Size: 18" Per Record	**Material:** Concrete	**Good Condition:** YES
Utility Type: Storm Line		**Utility Owner:**

ADDITIONAL UTILITY INFORMATION

Utility Size:	**Material:**	**See Test Hole No.:**
Utility Type: None		**Utility Owner:**

SITE CONDITIONS

Field Condition: Asphalt	**Pavement thickness:** 9"
Ground Condition: Brown Soil	

FIRST & SECOND BENCHMARK INFORMATION

1st Elevation:	**1st Benchmark Description:**
BM Check:	
2nd Elevation:	**2nd Benchmark Description:**
Elevation Datum:	

FIELD MARKER INFORMATION

Type set: Mag Nail	**Elevation:** 257.55'
Offset/Direction: Nail is set C/L of the Utility.	

PROFILE VIEW

Top of utility field measurement: 7.72' **Elevation:** 249.83'

Bottom of utility field measurement: None **Elevation:** None

Facing: West **Utility Width/Spacing:**

PLAN VIEW

COORDINATES

Northing: 7005022.6081 **Easting:** 11883425.2068

COMMENTS/NOTES

TEST HOLE FORM

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Project: M-0618-0201-R085 (N. Highlands)	**Prepared By:** Chris Lugiano	**Date:** 2019-07-01
City: Arlington	**State:** VA	**Test Hole:** 5 of
General Location: N. Highland / 1st Road		

UTILITY INFORMATION

Utility Size: 6 3/4"	**Material:** Ductile Iron	**Good Condition:** YES
Utility Type: Water Line		**Utility Owner:** Arlington County

ADDITIONAL UTILITY INFORMATION

Utility Size:	**Material:**	**See Test Hole No.:**
Utility Type: None		**Utility Owner:**

SITE CONDITIONS

Field Condition: Asphalt	**Pavement thickness:** 12"
Ground Condition: Brown Soil	

FIRST & SECOND BENCHMARK INFORMATION

1st Elevation:	**1st Benchmark Description:**
BM Check:	
2nd Elevation:	**2nd Benchmark Description:**
Elevation Datum:	

FIELD MARKER INFORMATION

Type set: Mag Nail	**Elevation:** 258.08'
Offset/Direction: Nail is set C/L of the Utility.	

PROFILE VIEW

Top of utility field measurement: 3.82' **Elevation:** 254.26'

Bottom of utility field measurement: None **Elevation:** None

Facing: Northwest **Utility Width/Spacing:**

PLAN VIEW

COORDINATES

Northing: 7004867.7704 **Easting:** 11883497.5837

COMMENTS/NOTES

TEST HOLE FORM

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Project: M-0618-0201-R085 (N. Highlands)	**Prepared By:** Chris Lugiano	**Date:** 2019-07-02
City: Arlington	**State:** VA	**Test Hole:** 6 of
General Location: N. Highland / Arlington Blvd - Near Bike Trail		

UTILITY INFORMATION

Utility Size: 6 3/4"	**Material:** Ductile Iron	**Good Condition:** YES
Utility Type: Water Line		**Utility Owner:** Arlington County

ADDITIONAL UTILITY INFORMATION

Utility Size:	**Material:**	**See Test Hole No.:**
Utility Type: None		**Utility Owner:**

SITE CONDITIONS

Field Condition: Asphalt	**Pavement thickness:** 10"
Ground Condition: Wet Brown Soil / 21-A	

FIRST & SECOND BENCHMARK INFORMATION

1st Elevation:	**1st Benchmark Description:**
BM Check:	
2nd Elevation:	**2nd Benchmark Description:**
Elevation Datum:	

FIELD MARKER INFORMATION

Type set: Mag Nail	**Elevation:** 236.25'
Offset/Direction: Nail is set C/L of the Utility.	

PROFILE VIEW

Top of utility field measurement: 3.33' **Elevation:** 232.92'

Bottom of utility field measurement: None **Elevation:** None

Facing: Northwest **Utility Width/Spacing:**

PLAN VIEW

COORDINATES

Northing: 7004067.6270 **Easting:** 11883742.0380

COMMENTS/NOTES

TEST HOLE FORM

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Project: M-0618-0201-R085 (N. Highlands)	**Prepared By:** Chris Lugiano	**Date:** 2019-07-08
City: Arlington	**State:** VA	**Test Hole:** 7 of
General Location: N. Highland / 2nd Street		

UTILITY INFORMATION

Utility Size: 8 3/4"	**Material:** Ductile Iron	**Good Condition:** YES
Utility Type: Water Line		**Utility Owner:** Arlington County

ADDITIONAL UTILITY INFORMATION

Utility Size:	**Material:**	**See Test Hole No.:**
Utility Type: None		**Utility Owner:**

SITE CONDITIONS

Field Condition: Asphalt	**Pavement thickness:** 9"
Ground Condition: Brown Soil	

FIRST & SECOND BENCHMARK INFORMATION

1st Elevation:	**1st Benchmark Description:**
BM Check:	
2nd Elevation:	**2nd Benchmark Description:**
Elevation Datum:	

FIELD MARKER INFORMATION

Type set: Mag Nail	**Elevation:** 263.64'
Offset/Direction: Nail is set C/L of the Utility.	

PROFILE VIEW

Top of utility field measurement: 3.00' **Elevation:** 260.64'

Bottom of utility field measurement: None **Elevation:** None

Facing: Northeast **Utility Width/Spacing:**

PLAN VIEW

COORDINATES

Northing: 7005118.2651 **Easting:** 11883402.7475

COMMENTS/NOTES

TEST HOLE FORM

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Project: M-0618-0201-R085 (N. Highlands)	**Prepared By:** Chris Lugiano	**Date:** 2019-07-09
City: Arlington	**State:** VA	**Test Hole:** 8 of
General Location: N. Highland / 1st Road		

UTILITY INFORMATION

Utility Size: 20"	**Material:** Cast Iron	**Good Condition:** YES
Utility Type: Water Line		**Utility Owner:** Arlington County

ADDITIONAL UTILITY INFORMATION

Utility Size:	**Material:**	**See Test Hole No.:**
Utility Type: None		**Utility Owner:**

SITE CONDITIONS

Field Condition: Asphalt	**Pavement thickness:** 11"
Ground Condition: Brown Soil	

FIRST & SECOND BENCHMARK INFORMATION

1st Elevation:	**1st Benchmark Description:**
BM Check:	
2nd Elevation:	**2nd Benchmark Description:**
Elevation Datum:	

FIELD MARKER INFORMATION

Type set: Mag Nail	**Elevation:** 258.41'
Offset/Direction: Nail is set C/L of the Utility.	

PROFILE VIEW

Top of utility field measurement: 6.90' **Elevation:** 251.51'

Bottom of utility field measurement: None **Elevation:** None

Facing: Northwest **Utility Width/Spacing:**

PLAN VIEW

COORDINATES

Northing: 7004869.5374 **Easting:** 11883482.6004

COMMENTS/NOTES

TEST HOLE FORM

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Project: M-0618-0201-R085 (N. Highlands)	**Prepared By:** Chris Lugiano	**Date:** 2019-07-01
City: Arlington	**State:** VA	**Test Hole:** 9 of
General Location: N. Highland / 1st Road		

UTILITY INFORMATION

Utility Size: 2"	**Material:** Epoxy Coated Steel	**Good Condition:** YES
Utility Type: Gas Line		**Utility Owner:** Washington Gas

ADDITIONAL UTILITY INFORMATION

Utility Size:	**Material:**	**See Test Hole No.:**
Utility Type: None		**Utility Owner:**

SITE CONDITIONS

Field Condition: Asphalt	**Pavement thickness:** 10"
Ground Condition: Brown Soil	

FIRST & SECOND BENCHMARK INFORMATION

1st Elevation:	**1st Benchmark Description:**
BM Check:	
2nd Elevation:	**2nd Benchmark Description:**
Elevation Datum:	

FIELD MARKER INFORMATION

Type set: Mag Nail	**Elevation:** 257.74'
Offset/Direction: Nail is set C/L of the Utility.	

PROFILE VIEW

Top of utility field measurement: 3.39' **Elevation:** 254.35'

Bottom of utility field measurement: None **Elevation:** None

Facing: Northwest **Utility Width/Spacing:**

PLAN VIEW

COORDINATES

Northing: 7004882.3006 **Easting:** 11883473.6138

COMMENTS/NOTES

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Project: M-0618-0201-R085 (N. Highlands)	**Prepared By:** Chris Lugiano	**Date:** 2019-07-01
City: Arlington	**State:** VA	**Test Hole:** 10 of
General Location: N. Highland / 1st Road		

UTILITY INFORMATION

Utility Size: 2"	**Material:** Epoxy Coated Steel	**Good Condition:** YES
Utility Type: Gas Line		**Utility Owner:** Washington Gas

ADDITIONAL UTILITY INFORMATION

Utility Size:	**Material:**	**See Test Hole No.:**
Utility Type: None		**Utility Owner:**

SITE CONDITIONS

Field Condition: Asphalt	**Pavement thickness:** 9"
Ground Condition: Brown Soil	

FIRST & SECOND BENCHMARK INFORMATION

1st Elevation:	**1st Benchmark Description:**
BM Check:	
2nd Elevation:	**2nd Benchmark Description:**
Elevation Datum:	

FIELD MARKER INFORMATION

Type set: Mag Nail	**Elevation:** 258.70'
Offset/Direction: Nail is set C/L of the Utility.	

PROFILE VIEW

Top of utility field measurement: 2.49' **Elevation:** 256.21'

Bottom of utility field measurement: None **Elevation:** None

Facing: West **Utility Width/Spacing:**

PLAN VIEW

COORDINATES

Northing: 7004865.0627 **Easting:** 11883463.5880

COMMENTS/NOTES

TEST HOLE FORM

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Project: M-0618-0201-R085 (N. Highlands)	**Prepared By:** Chris Lugiano	**Date:** 2019-07-10
City: Arlington	**State:** VA	**Test Hole:** 11 of
General Location: N. Highland / 1st Road		

UTILITY INFORMATION

Utility Size: 24"	**Material:** Rough Pour Concrete	**Good Condition:** YES
Utility Type: Communication Ductbank		**Utility Owner:**

ADDITIONAL UTILITY INFORMATION

Utility Size:	**Material:**	**See Test Hole No.:**
Utility Type: None		**Utility Owner:**

SITE CONDITIONS

Field Condition: Asphalt	**Pavement thickness:** 12"
Ground Condition: Wet Brown Soil	

FIRST & SECOND BENCHMARK INFORMATION

1st Elevation:	**1st Benchmark Description:**
BM Check:	
2nd Elevation:	**2nd Benchmark Description:**
Elevation Datum:	

FIELD MARKER INFORMATION

Type set: Mag Nail	**Elevation:** 258.75'
Offset/Direction: Nail is set C/L of the Utility.	

PROFILE VIEW

Top of utility field measurement: 5.70' **Elevation:** 253.05'

Bottom of utility field measurement: 6.10' **Elevation:** 252.65'

Facing: Northwest **Utility Width/Spacing:**

PLAN VIEW

COORDINATES

Northing: 7004865.3917 **Easting:** 11883470.0069

COMMENTS/NOTES

Crew only able to clear to 6.10' due to excessive mud cave in and ground water. Height of duct from inside vault is 48"

TEST HOLE FORM

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Project: M-0618-0201-R085 (N. Highlands)	**Prepared By:** Chris Lugiano	**Date:** 2019-07-08
City: Arlington	**State:** VA	**Test Hole:** 12 of
General Location: N. Highland		

UTILITY INFORMATION

Utility Size: 2"	**Material:** Epoxy Coated Steel	**Good Condition:** YES
Utility Type: Gas Line		**Utility Owner:**

ADDITIONAL UTILITY INFORMATION

Utility Size:	**Material:**	**See Test Hole No.:**
Utility Type: None		**Utility Owner:**

SITE CONDITIONS

Field Condition: Asphalt	**Pavement thickness:** Asphalt - 9" / Concrete - 5"
Ground Condition: Brown Soil / Concrete	

FIRST & SECOND BENCHMARK INFORMATION

1st Elevation:	**1st Benchmark Description:**
BM Check:	
2nd Elevation:	**2nd Benchmark Description:**
Elevation Datum:	

FIELD MARKER INFORMATION

Type set: Mag Nail	**Elevation:** 258.97'
Offset/Direction: Nail is set C/L of the Utility.	

PROFILE VIEW

Top of utility field measurement: 5.08' **Elevation:** 253.89'

Bottom of utility field measurement: None **Elevation:** None

Facing: None **Utility Width/Spacing:**

PLAN VIEW

COORDINATES

Northing: 7004858.4002 **Easting:** 11883485.6549

COMMENTS/NOTES

TEST HOLE FORM

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Project: M-0618-0201-R085 (N. Highlands)	**Prepared By:** Chris Lugiano	**Date:** 2019-07-01
City: Arlington	**State:** VA	**Test Hole:** 13 of
General Location: N. Highland / 1st Road		

UTILITY INFORMATION

Utility Size: 2"	**Material:** Epoxy Coated Steel	**Good Condition:** YES
Utility Type: Gas Line		**Utility Owner:** Washington Gas

ADDITIONAL UTILITY INFORMATION

Utility Size:	**Material:**	**See Test Hole No.:**
Utility Type: None		**Utility Owner:**

SITE CONDITIONS

Field Condition: Asphalt	**Pavement thickness:** 7"
Ground Condition: Brown Soil	

FIRST & SECOND BENCHMARK INFORMATION

1st Elevation:	**1st Benchmark Description:**
BM Check:	
2nd Elevation:	**2nd Benchmark Description:**
Elevation Datum:	

FIELD MARKER INFORMATION

Type set: Mag Nail	**Elevation:** 259.66'
Offset/Direction: Nail is set C/L of the Utility.	

PROFILE VIEW

Top of utility field measurement: 2.61' **Elevation:** 257.05'

Bottom of utility field measurement: None **Elevation:** None

Facing: West **Utility Width/Spacing:**

PLAN VIEW

COORDINATES

Northing: 7004837.9937 **Easting:** 11883487.9660

COMMENTS/NOTES

TEST HOLE FORM

MID-ATLANTIC UTILITY LOCATING, L.L.C.

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Project: M-0618-0201-R085 (N. Highlands)	**Prepared By:** Chris Lugiano	**Date:** 2019-07-02
City: Arlington	**State:** VA	**Test Hole:** 14 of
General Location: Grass Area next to Bike Trail		

UTILITY INFORMATION

Utility Size: 6 3/4"	**Material:** Ductile Iron	**Good Condition:** YES
Utility Type: Water Line		**Utility Owner:** Arlington County

ADDITIONAL UTILITY INFORMATION

Utility Size:	**Material:**	**See Test Hole No.:**
Utility Type: None		**Utility Owner:**

SITE CONDITIONS

Field Condition: Grass Area	**Pavement thickness:**
Ground Condition: Hard Brown Soil	

FIRST & SECOND BENCHMARK INFORMATION

1st Elevation:	**1st Benchmark Description:**
BM Check:	
2nd Elevation:	**2nd Benchmark Description:**
Elevation Datum:	

FIELD MARKER INFORMATION

Type set: Wooden Hub	**Elevation:** 236.85'
Offset/Direction: Hub is set C/L of the Utility.	

PROFILE VIEW

Top of utility field measurement: 4.39' **Elevation:** 232.46'

Bottom of utility field measurement: None **Elevation:** None

Facing: East **Utility Width/Spacing:**

PLAN VIEW

COORDINATES

Northing: 7004058.7622 **Easting:** 11883726.9752

COMMENTS/NOTES

TEST HOLE FORM

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Project: M-0618-0201-R085 (N. Highlands)	**Prepared By:** Chris Lugiano	**Date:** 2019-06-28
City: Arlington	**State:** VA	**Test Hole:** 15 of
General Location: N. Highland / 1st St		

UTILITY INFORMATION

Utility Size: 4"	**Material:** Epoxy Coated Steel	**Good Condition:** YES
Utility Type: Gas Line		**Utility Owner:** Washington Gas

ADDITIONAL UTILITY INFORMATION

Utility Size:	**Material:**	**See Test Hole No.:**
Utility Type: None		**Utility Owner:**

SITE CONDITIONS

Field Condition: Asphalt	**Pavement thickness:** 8 1/2"
Ground Condition: Brown Soil	

FIRST & SECOND BENCHMARK INFORMATION

1st Elevation:	**1st Benchmark Description:**
BM Check:	
2nd Elevation:	**2nd Benchmark Description:**
Elevation Datum:	

FIELD MARKER INFORMATION

Type set: Mag Nail	**Elevation:** 259.19'
Offset/Direction: Nail is set C/L of the Utility.	

PROFILE VIEW

Top of utility field measurement: 3.78' **Elevation:** 255.41'

Bottom of utility field measurement: None **Elevation:** None

Facing: South **Utility Width/Spacing:**

PLAN VIEW

COORDINATES

Northing: 7004617.7009 **Easting:** 11883556.7328

COMMENTS/NOTES

TEST HOLE FORM

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Project: M-0618-0201-R085 (N. Highlands)	**Prepared By:** Chris Lugiano	**Date:** 2019-07-09
City: Arlington	**State:** VA	**Test Hole:** 16 of
General Location: N. Highland / 1st Street N		

UTILITY INFORMATION

Utility Size: 4"	**Material:** Epoxy Coated Steel	**Good Condition:** YES
Utility Type: Gas Line		**Utility Owner:** Washington Gas

ADDITIONAL UTILITY INFORMATION

Utility Size:	**Material:**	**See Test Hole No.:**
Utility Type: None		**Utility Owner:**

SITE CONDITIONS

Field Condition: Asphalt	**Pavement thickness:** 7"
Ground Condition: Brown Soil	

FIRST & SECOND BENCHMARK INFORMATION

1st Elevation:	**1st Benchmark Description:**
BM Check:	
2nd Elevation:	**2nd Benchmark Description:**
Elevation Datum:	

FIELD MARKER INFORMATION

Type set: Mag Nail	**Elevation:** 259.40'
Offset/Direction: Nail is set C/L of the Utility.	

PROFILE VIEW

Top of utility field measurement: 3.89' **Elevation:** 255.51'

Bottom of utility field measurement: None **Elevation:** None

Facing: East **Utility Width/Spacing:**

PLAN VIEW

COORDINATES

Northing: 7004593.9847 **Easting:** 11883567.0444

COMMENTS/NOTES

The Gas Lines in this intersection are 4" - Not 2" as shown on plans. TH 27 (Water) CL is approximately 10" North of TH 16 (Gas).

TEST HOLE FORM

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Project: M-0618-0201-R085 (N. Highlands)	**Prepared By:** Chris Lugiano	**Date:** 2019-06-28
City: Arlington	**State:** VA	**Test Hole:** 17 of
General Location: N. Highland / 1st Street		

UTILITY INFORMATION

Utility Size: 6 3/4"	**Material:** Ductile Iron	**Good Condition:** YES
Utility Type: Water Line		**Utility Owner:** Arlington County

ADDITIONAL UTILITY INFORMATION

Utility Size:	**Material:**	**See Test Hole No.:**
Utility Type: None		**Utility Owner:**

SITE CONDITIONS

Field Condition: Grass Area	**Pavement thickness:**
Ground Condition: Brown Soil / Roots	

FIRST & SECOND BENCHMARK INFORMATION

1st Elevation:	**1st Benchmark Description:**
BM Check:	
2nd Elevation:	**2nd Benchmark Description:**
Elevation Datum:	

FIELD MARKER INFORMATION

Type set: Chiseled "X"	**Elevation:** 258.88'
Offset/Direction: Chiseled "X" is set C/L of the Utility.	

PROFILE VIEW

Top of utility field measurement: 4.22' **Elevation:** 254.66'

Bottom of utility field measurement: None **Elevation:** None

Facing: East **Utility Width/Spacing:**

PLAN VIEW

COORDINATES

Northing: 7004589.7959 **Easting:** 11883552.9855

COMMENTS/NOTES

Chiseled 'X' Located on curb. Water Line is CL with the curb. Not in the road as plans depict.

TEST HOLE FORM

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Project: M-0618-0201-R085 (N. Highlands)	**Prepared By:** Chris Lugiano	**Date:** 2019-06-28
City: Arlington	**State:** VA	**Test Hole:** 18 of
General Location: N. Highland / 1st Street		

UTILITY INFORMATION

Utility Size: 24"	**Material:** Rough Pour Concrete	**Good Condition:** YES
Utility Type: Communication Ductbank		**Utility Owner:** ATT

ADDITIONAL UTILITY INFORMATION

Utility Size:	**Material:**	**See Test Hole No.:**
Utility Type: None		**Utility Owner:**

SITE CONDITIONS

Field Condition: Asphalt	**Pavement thickness:**
Ground Condition: Brown Soil / Stone Dust	

FIRST & SECOND BENCHMARK INFORMATION

1st Elevation:	**1st Benchmark Description:**
BM Check:	
2nd Elevation:	**2nd Benchmark Description:**
Elevation Datum:	

FIELD MARKER INFORMATION

Type set: Mag Nail	**Elevation:** 259.26'
Offset/Direction: Nail is set C/L of the Utility.	

PROFILE VIEW

Top of utility field measurement: 4.95' **Elevation:** 254.31'

Bottom of utility field measurement: 6.21' **Elevation:** 253.05'

Facing: South **Utility Width/Spacing:** 24"

PLAN VIEW

COORDINATES

Northing: 7004598.5774 **Easting:** 11883560.3270

COMMENTS/NOTES

TEST HOLE FORM

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Project: M-0618-0201-R085 (N. Highlands)	**Prepared By:** Chris Lugiano	**Date:** 2019-07-08
City: Arlington	**State:** VA	**Test Hole:** 19 of
General Location: N. Highland / 2nd Street		

UTILITY INFORMATION

Utility Size: 20"	**Material:** Cast Iron	**Good Condition:** YES
Utility Type: Water Line		**Utility Owner:** Arlington County

ADDITIONAL UTILITY INFORMATION

Utility Size:	**Material:**	**See Test Hole No.:**
Utility Type: None		**Utility Owner:**

SITE CONDITIONS

Field Condition: Asphalt	**Pavement thickness:** 11"
Ground Condition: Brown Soil	

FIRST & SECOND BENCHMARK INFORMATION

1st Elevation:	**1st Benchmark Description:**
BM Check:	
2nd Elevation:	**2nd Benchmark Description:**
Elevation Datum:	

FIELD MARKER INFORMATION

Type set: Mag Nail	**Elevation:** 263.60'
Offset/Direction: Nail is set C/L of the Utility.	

PROFILE VIEW

Top of utility field measurement: 6.60' **Elevation:** 257.00'

Bottom of utility field measurement: None **Elevation:** None

Facing: Northwest **Utility Width/Spacing:**

PLAN VIEW

COORDINATES

Northing: 7005115.8344 **Easting:** 11883399.2262

COMMENTS/NOTES

TEST HOLE FORM

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Project: M-0618-0201-R085 (N. Highlands)	**Prepared By:** Chris Lugiano	**Date:** 2019-07-02
City: Arlington	**State:** VA	**Test Hole:** 20 of
General Location: N. Highland / Arlington Blvd - Near Bike Trail		

UTILITY INFORMATION

Utility Size: 6 3/4"	**Material:** Ductile Iron	**Good Condition:** YES
Utility Type: Water Line		**Utility Owner:** Arlington County

ADDITIONAL UTILITY INFORMATION

Utility Size:	**Material:**	**See Test Hole No.:**
Utility Type: None		**Utility Owner:**

SITE CONDITIONS

Field Condition: Asphalt	**Pavement thickness:** 5"
Ground Condition: Wet Black Soil	

FIRST & SECOND BENCHMARK INFORMATION

1st Elevation:	**1st Benchmark Description:**
BM Check:	
2nd Elevation:	**2nd Benchmark Description:**
Elevation Datum:	

FIELD MARKER INFORMATION

Type set: Mag Nail	**Elevation:** 238.15'
Offset/Direction: Nail is set C/L of the Utility.	

PROFILE VIEW

Top of utility field measurement: 3.20' **Elevation:** 234.95'

Bottom of utility field measurement: None **Elevation:** None

Facing: Northwest **Utility Width/Spacing:**

PLAN VIEW

COORDINATES

Northing: 7004102.6160 **Easting:** 11883730.0365

COMMENTS/NOTES

TEST HOLE FORM

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Project: M-0618-0201-R085 (N. Highlands)	**Prepared By:** Chris Lugiano	**Date:** 2019-07-02
City: Arlington	**State:** VA	**Test Hole:** 21 of
General Location: N. Highland / Arlington Blvd - Near Bike Trail		

UTILITY INFORMATION

Utility Size: 2"	**Material:** Epoxy Coated Steel	**Good Condition:** YES
Utility Type: Gas Line		**Utility Owner:** Washington Gas

ADDITIONAL UTILITY INFORMATION

Utility Size:	**Material:**	**See Test Hole No.:**
Utility Type: None		**Utility Owner:**

SITE CONDITIONS

Field Condition: Asphalt	**Pavement thickness:**
Ground Condition: Wet Brown Soil / 21-A	

FIRST & SECOND BENCHMARK INFORMATION

1st Elevation:	**1st Benchmark Description:**
BM Check:	
2nd Elevation:	**2nd Benchmark Description:**
Elevation Datum:	

FIELD MARKER INFORMATION

Type set: Wooden Hub	**Elevation:** 237.04'
Offset/Direction: Hub is set C/L of the Utility.	

PROFILE VIEW

Top of utility field measurement: 3.05' **Elevation:** 233.99'

Bottom of utility field measurement: None **Elevation:** None

Facing: East **Utility Width/Spacing:**

PLAN VIEW

COORDINATES

Northing: 7004078.3639 **Easting:** 11883741.1833

COMMENTS/NOTES

TEST HOLE FORM

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Project: M-0618-0201-R085 (N. Highlands)	**Prepared By:** Chris Lugiano	**Date:** 2019-07-11
City: Arlington	**State:** VA	**Test Hole:** 22 of
General Location: Near Bike Trail		

UTILITY INFORMATION

Utility Size: 24"	**Material:** Rough Pour Concrete	**Good Condition:** YES
Utility Type: Communication Ductbank		**Utility Owner:**

ADDITIONAL UTILITY INFORMATION

Utility Size:	**Material:**	**See Test Hole No.:**
Utility Type: None		**Utility Owner:**

SITE CONDITIONS

Field Condition: Grass Area	**Pavement thickness:**
Ground Condition: Wet BS / Water	

FIRST & SECOND BENCHMARK INFORMATION

1st Elevation:	**1st Benchmark Description:**
BM Check:	
2nd Elevation:	**2nd Benchmark Description:**
Elevation Datum:	

FIELD MARKER INFORMATION

Type set: Wooden Hub	**Elevation:** 236.97'
Offset/Direction: Hub is set C/L of the Utility.	

PROFILE VIEW

Top of utility field measurement: 5.08' **Elevation:** 231.89'

Bottom of utility field measurement: 5.95' **Elevation:** 231.02'

Facing: Northwest **Utility Width/Spacing:**

PLAN VIEW

COORDINATES

Northing: 7004065.7203 **Easting:** 11883732.7834

COMMENTS/NOTES

Crew was unable to determine bottom due to excessive mud and cave in at 5.95'

TEST HOLE FORM

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Project: M-0618-0201-R085 (N. Highlands)	**Prepared By:** Chris Lugiano	**Date:** 2019-07-02
City: Arlington	**State:** VA	**Test Hole:** 23 of
General Location: N. Highland / Arlington Blvd - Near Bike Trail		

UTILITY INFORMATION

Utility Size: 6 3/4"	**Material:** Ductile Iron	**Good Condition:** YES
Utility Type: Water Line		**Utility Owner:** Arlington County

ADDITIONAL UTILITY INFORMATION

Utility Size:	**Material:**	**See Test Hole No.:**
Utility Type: None		**Utility Owner:**

SITE CONDITIONS

Field Condition: Asphalt	**Pavement thickness:** 7"
Ground Condition: Wet Brown Soil / 21-A	

FIRST & SECOND BENCHMARK INFORMATION

1st Elevation:	**1st Benchmark Description:**
BM Check:	
2nd Elevation:	**2nd Benchmark Description:**
Elevation Datum:	

FIELD MARKER INFORMATION

Type set: Mag Nail	**Elevation:** 235.19'
Offset/Direction: Nail is set C/L of the Utility.	

PROFILE VIEW

Top of utility field measurement: 3.18' **Elevation:** 232.01'

Bottom of utility field measurement: None **Elevation:** None

Facing: Northwest **Utility Width/Spacing:**

PLAN VIEW

COORDINATES

Northing: 7004051.2619 **Easting:** 11883747.4854

COMMENTS/NOTES

TEST HOLE FORM

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Project: M-0618-0201-R085 (N. Highlands)	**Prepared By:** Chris Lugiano	**Date:** 2019-07-03
City: Arlington	**State:** VA	**Test Hole:** 24 of
General Location: 38 N. Highland		

UTILITY INFORMATION

Utility Size: 20"	**Material:** Cast Iron	**Good Condition:** YES
Utility Type: Water Line		**Utility Owner:** Arlington County

ADDITIONAL UTILITY INFORMATION

Utility Size:	**Material:**	**See Test Hole No.:**
Utility Type: None		**Utility Owner:**

SITE CONDITIONS

Field Condition: Asphalt / Concrete	**Pavement thickness:** A= 3" / C= 8"
Ground Condition: Brown Soil	

FIRST & SECOND BENCHMARK INFORMATION

1st Elevation:	**1st Benchmark Description:**
BM Check:	
2nd Elevation:	**2nd Benchmark Description:**
Elevation Datum:	

FIELD MARKER INFORMATION

Type set: Mag Nail	**Elevation:** 255.41'
Offset/Direction: Nail is set C/L of the Utility.	

PROFILE VIEW

Top of utility field measurement: 4.53' **Elevation:** 250.88'

Bottom of utility field measurement: None **Elevation:** None

Facing: Northwest **Utility Width/Spacing:**

PLAN VIEW

COORDINATES

Northing: 7004476.3469 **Easting:** 11883612.7369

COMMENTS/NOTES

TEST HOLE FORM

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Project: M-0618-0201-R085 (N. Highlands)	**Prepared By:** Chris Lugiano	**Date:** 2019-06-27
City: Arlington	**State:** VA	**Test Hole:** 25 of
General Location: N. Highland / 1st Street		

UTILITY INFORMATION

Utility Size: 2"	**Material:** Cast Iron	**Good Condition:** YES
Utility Type: Gas Line		**Utility Owner:** Washington Gas

ADDITIONAL UTILITY INFORMATION

Utility Size:	**Material:**	**See Test Hole No.:**
Utility Type: None		**Utility Owner:**

SITE CONDITIONS

Field Condition: Asphalt	**Pavement thickness:** 12"
Ground Condition: Brown Soil	

FIRST & SECOND BENCHMARK INFORMATION

1st Elevation:	**1st Benchmark Description:**
BM Check:	
2nd Elevation:	**2nd Benchmark Description:**
Elevation Datum:	

FIELD MARKER INFORMATION

Type set: Mag Nail	**Elevation:** 259.45'
Offset/Direction: Nail is set C/L of the Utility.	

PROFILE VIEW

Top of utility field measurement: 3.11' **Elevation:** 256.34'

Bottom of utility field measurement: None **Elevation:** None

Facing: West **Utility Width/Spacing:**

PLAN VIEW

COORDINATES

Northing: 7004604.3459 **Easting:** 11883564.6509

COMMENTS/NOTES

TEST HOLE FORM

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Project: M-0618-0201-R085 (N. Highlands)	**Prepared By:** Chris Lugiano	**Date:** 2019-07-01
City: Arlington	**State:** VA	**Test Hole:** 26 of
General Location: N. Highland / 1st Road		

UTILITY INFORMATION

Utility Size: 6 3/4"	**Material:** Ductile Iron	**Good Condition:** YES
Utility Type: Water Line		**Utility Owner:** Arlington County

ADDITIONAL UTILITY INFORMATION

Utility Size:	**Material:**	**See Test Hole No.:**
Utility Type: None		**Utility Owner:**

SITE CONDITIONS

Field Condition: Asphalt	**Pavement thickness:** 11"
Ground Condition: Brown Soil	

FIRST & SECOND BENCHMARK INFORMATION

1st Elevation:	**1st Benchmark Description:**
BM Check:	
2nd Elevation:	**2nd Benchmark Description:**
Elevation Datum:	

FIELD MARKER INFORMATION

Type set: Mag Nail	**Elevation:** 258.31'
Offset/Direction: Nail is set C/L of the Utility.	

PROFILE VIEW

Top of utility field measurement: 4.25' **Elevation:** 254.06'

Bottom of utility field measurement: None **Elevation:** None

Facing: East **Utility Width/Spacing:**

PLAN VIEW

COORDINATES

Northing: 7004872.6022 **Easting:** 11883476.6401

COMMENTS/NOTES

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Project: M-0618-0201-R085 (N. Highlands)	**Prepared By:** Chris Lugiano	**Date:** 2019-06-27
City: Arlington	**State:** VA	**Test Hole:** 27 of
General Location: N. Highland / 1st Street		

UTILITY INFORMATION

Utility Size: 6 3/4"	**Material:** Ductile Iron	**Good Condition:** YES
Utility Type: Water Line		**Utility Owner:** Arlington County

ADDITIONAL UTILITY INFORMATION

Utility Size:	**Material:**	**See Test Hole No.:**
Utility Type: None		**Utility Owner:**

SITE CONDITIONS

Field Condition: Asphalt	**Pavement thickness:** 9"
Ground Condition: Brown Soil	

FIRST & SECOND BENCHMARK INFORMATION

1st Elevation:	**1st Benchmark Description:**
BM Check:	
2nd Elevation:	**2nd Benchmark Description:**
Elevation Datum:	

FIELD MARKER INFORMATION

Type set: Mag Nail	**Elevation:** 259.51'
Offset/Direction: Nail is set C/L of the Utility.	

PROFILE VIEW

Top of utility field measurement: 3.97' **Elevation:** 255.54'

Bottom of utility field measurement: None **Elevation:** None

Facing: West **Utility Width/Spacing:**

PLAN VIEW

COORDINATES

Northing: 7004595.3471 **Easting:** 11883568.2782

COMMENTS/NOTES

TEST HOLE FORM

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Project: M-0618-0201-R085 (N. Highlands)	**Prepared By:** Chris Lugiano	**Date:** 2019-07-03
City: Arlington	**State:** VA	**Test Hole:** 28 of
General Location: 38 N. Highland		

UTILITY INFORMATION

Utility Size: 6 3/4"	**Material:** Ductile Iron	**Good Condition:** YES
Utility Type: Water Line		**Utility Owner:** Arlington County

ADDITIONAL UTILITY INFORMATION

Utility Size:	**Material:**	**See Test Hole No.:**
Utility Type: None		**Utility Owner:**

SITE CONDITIONS

Field Condition: Asphalt	**Pavement thickness:** 5"
Ground Condition: Wet Brown Soil	

FIRST & SECOND BENCHMARK INFORMATION

1st Elevation:	**1st Benchmark Description:**
BM Check:	
2nd Elevation:	**2nd Benchmark Description:**
Elevation Datum:	

FIELD MARKER INFORMATION

Type set: Mag Nail	**Elevation:** 255.04'
Offset/Direction: Nail is set C/L of the Utility.	

PROFILE VIEW

Top of utility field measurement: 3.73' **Elevation:** 251.31'

Bottom of utility field measurement: None **Elevation:** None

Facing: Northwest **Utility Width/Spacing:**

PLAN VIEW

COORDINATES

Northing: 7004473.0943 **Easting:** 11883604.4256

COMMENTS/NOTES

TEST HOLE FORM

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Project: M-0618-0201-R085 (N. Highlands)	**Prepared By:** Chris Lugiano	**Date:** 2019-07-03
City: Arlington	**State:** VA	**Test Hole:** 29 of
General Location: 20 N. Highland		

UTILITY INFORMATION

Utility Size: 6 3/4"	**Material:** Ductile Iron	**Good Condition:** YES
Utility Type: Water Line		**Utility Owner:** Arlington County

ADDITIONAL UTILITY INFORMATION

Utility Size:	**Material:**	**See Test Hole No.:**
Utility Type: None		**Utility Owner:**

SITE CONDITIONS

Field Condition: Asphalt	**Pavement thickness:** 12"
Ground Condition: Brown Soil	

FIRST & SECOND BENCHMARK INFORMATION

1st Elevation:	**1st Benchmark Description:**
BM Check:	
2nd Elevation:	**2nd Benchmark Description:**
Elevation Datum:	

FIELD MARKER INFORMATION

Type set: Mag Nail	**Elevation:** 248.71'
Offset/Direction: Nail is set C/L of the Utility.	

PROFILE VIEW

Top of utility field measurement: 4.23' **Elevation:** 244.48'

Bottom of utility field measurement: None **Elevation:** None

Facing: Northwest **Utility Width/Spacing:**

PLAN VIEW

COORDINATES

Northing: 7004285.1155 **Easting:** 11883668.3062

COMMENTS/NOTES

TEST HOLE FORM

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Project: M-0618-0201-R085 (N. Highlands)	**Prepared By:** Chris Lugiano	**Date:** 2019-07-17
City: Arlington	**State:** VA	**Test Hole:** 30 of
General Location: 34 N. Highland		

UTILITY INFORMATION

Utility Size: 20"	**Material:** Cast Iron	**Good Condition:** YES
Utility Type: Water Line		**Utility Owner:**

ADDITIONAL UTILITY INFORMATION

Utility Size:	**Material:**	**See Test Hole No.:**
Utility Type: None		**Utility Owner:**

SITE CONDITIONS

Field Condition: Asphalt	**Pavement thickness:** 12"
Ground Condition: Brown Soil / Sand	

FIRST & SECOND BENCHMARK INFORMATION

1st Elevation:	**1st Benchmark Description:**
BM Check:	
2nd Elevation:	**2nd Benchmark Description:**
Elevation Datum:	

FIELD MARKER INFORMATION

Type set: Mag Nail	**Elevation:**
Offset/Direction: Nail is set C/L of the Utility.	

PROFILE VIEW

Top of utility field measurement: 4.41' **Elevation:**

Bottom of utility field measurement: None **Elevation:** None

Facing: Northwest **Utility Width/Spacing:**

PLAN VIEW

COORDINATES

Northing: **Easting:**

COMMENTS/NOTES

- Crew did not find a thrust block at the 45 degree turn on the water line. - Sand cave in prevented full photo of 45. - Nail is CL of the joint of 45.

ARLINGTON COUNTY
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REVISIONS

Revision	Description	Date
1	Removed Details R-2.3, R-2.3B St 1of2, R-2.3B 2of3, R-2.3C 1of2, R2.3C 2of2 and replaced with Details DW-1.0, DW-1.1, DW-2.0, DW-2.0 2of2, DW-2.1 1of2, DW-2.1 2of2, DW-2.2 1of2, DW-2.2 2of2, DW-2.3, DW-2.4, DW-2.5	5/13/2010
2	Removed the General Conditions, Sections 01100, 02110, 02201, 16550 & 16680. Removed Details R-5.1, R-5.1A, R-5.2, R-5.3, R-5.4, R-5.5A, R-5.5B, R-5.6A, R5.6B, R-5.3C, R-5.7, R-5.8, R-5.9, R-5.9A & R-5.9B Modified Sections 01000, 01300, 01400, 01500, 02100 & 02200. Updated the Table of Contents	02/17/2012
3	**Revised**: 01400 (Testing), 02400 (Sheeting, Shoring, & Bracing), 02505 (Storm Sewers & Appurtenances), 02510 (Sanitary Sewers & Appurtenances), 02550 (Water Mains & Appurtenances); **Created**: 02500 (Gravity Sewers & Appurtenances), 02515 (Televised Inspection of Sewers); **Revised Standards**: M-3.0 (Pipe & Bedding Details), D-1.7 (Catch Basin w/ Grate Top), D-3.2, Storm Sewer Manhole w/ Grate Cover), W8.1 and W-8.2 (Water Service Connections), W-9.3 through W-9.6 (Water Meter Installation), W-10.0 (Water Meter Fact Sheet) **Created Standard**: R-2.9 (Concrete Valley Gutter), R-8.1 (Bike Rack Layout) **Eliminated Standards**: R-7.0 through 7.9C and renamed R-7.9C (Continuous Soil Panel) to R-7.0, D-1.0 (Concrete Pipe Crushing Strength), D-5.0 through D-5.2, **Renamed** the DW- (Driveway) series of standards as R-2.3 and R2.4(A-C);	9/30/13
4	**Revised:** 01000 (General Provisions and Requirements), 01300 (Submittals and Submissions), 01500 (Temporary Erosions and Sediment Control), 02100 (Clearing and Grubbing), 02200 (Earthwork), 02210 (Riprap), 02400 (Sheeting, Shoring & Bracing), 02500 (Gravity sewers and Appurtenances), 02510 (Sanitary Sewers and Appurtenances), 02515 (Televised Inspection of Sewers), 02550 (Water Mains and Appurtenances), 02600 (Bituminous Roadway Pavements), 02601 (Bituminous Hiking, Biking and Jogging Trails), 02611 (Concrete Walks and Concrete Driveway Entrance), 02612 (Interlocking Concrete and Brick Pavers), 02613 (Paver Crosswalk), 02650 (Restoration of Roadway), 02750 (Curb and Gutters), 02950 (Tunneling), 02951 (Boring and Jacking), 03100 (Concrete Formwork, Reinforcement and Materials), 04200 (Masonry Units), 09010 (Painting of Structural Steel); **Created:** 01510 (Field Office Building), 01550 (Mobilization), 01720 (Project Record Documents), 02619 (Permanent Signs), 02900	11/2019

	(Pavement Markings), 13180 (Maintenance and Control of Traffic), 311300 (Tree Protection and Root Pruning), 329100 (Planting Preparation), 329200 (Seeding and Sodding), 329300 (Exterior Plants); **Removed:** 02800 (Landscaping), 2801 (Seeding and Sodding); **Revised Standards:** M-6.0 (Standard Pavement Restoration for Utility Cuts), M-6.1 (Modified Pavement Patching for Utility Cuts on Newly Paved Streets);	

PART 1- GENERAL

1. Purpose of Section

This section outlines the general provisions and requirements common to these standard specifications and details. This section includes definitions and abbreviations used throughout the specifications and details. All references in this section shall apply to the entirety of these Specifications unless, and except as, explicitly modified in specific sections.

2. Definitions

Wherever used in these Standards and Specifications, the following terms have the meanings indicated which are applicable to both the singular and plural thereof:

BUSINESS DAY – Any day that the County is open for general business.

CALENDAR DAY - Any day of twenty-four hours measured from midnight to the next midnight. Included are weekends and holidays. Where these Specifications do not clarify or distinguish between Calendar Day and Business Day, the reference shall be assumed to indicate a Calendar Day.

CONTRACT - The written agreement (including all attachments and amendments thereto) between OWNER and CONTRACTOR covering the work to be performed.

CONTRACT DOCUMENTS – The collection of documents which as a whole comprise the requirements of the Contract or Permit, including any amendments or addendums.

CONTRACT DRAWINGS – The drawings which show the locations, character, dimensions, and details of the Work to be performed under the Contract.

CONTRACTOR – The individual, partnership, firm, corporation, limited liability company, joint venture, or other person or entity contracting with the County for performance of prescribed work or holding a PERMIT for work to which these specifications apply.

COUNTY – See OWNER

ENGINEER – The Director, Department of Environmental Service, Arlington County, or designee.

OWNER – The County of Arlington, Virginia, for whom the work is to be performed.

PERMIT – Written authorization from the Engineer or other authorizing agency, where applicable, to perform the stipulated work.

PROJECT – The entire construction to be performed as provided in the Contract Documents, Permit, or other relevant construction plans or documents.

PROJECT OFFICER – See ENGINEER

PROVIDE – Indicates "provide complete and in place", that is to "furnish and install".

ROADWAY- The portion of the right of way used for vehicular, and/or pedestrian travel.

SHOP DRAWING – Fabrications, erection and setting drawings, manufacturer's standard drawings, schedules, descriptive literature, catalogs, brochures, performance and test data, wiring and control diagrams, and all other descriptive data pertaining to the materials and equipment as required to demonstrate compliance with the contract or permit requirements.

SUBCONTRACTOR – Those who have a direct contract with the Contractor or other Subcontractor to perform Work or furnish material worked to a special design according to the Contract Documents. However, the term shall not include those who merely furnish material not so worked.

SUBMITTAL – Any data required by the Contract Documents to be submitted to the Engineer at any point prior to continuing Work. By way of illustration, Submittals would include, but not be limited to: construction schedules, shop drawings, equipment specifications, material samples, and subcontractor or supplier lists.

SUPPLIER - Any person or organization who supplies materials or equipment for the work (including that fabricated to a special design), but who does not perform labor at the site.

WORK – The labor, equipment, materials, and all appurtenant items and actions necessary to satisfy the requirements and intent of the contract or permit.

3. Abbreviations

The following is a list of abbreviations used within the technical specifications. The appropriate designation shall refer to the latest edition or update published by that organization:

AASHTO	American Association of State Highway and Transportation Officials
ACI	American Concrete Institute
AISC	American Institute of Steel Construction
ANSI	American National Standard Institute
ASTM	American Society for Testing and Materials
AWPA	American Wood Preservers Association
AWS	American Welding Society
AWWA	American Water Works Association

NFPA	National Fire Protection Association
NFPA	National Forest Products Association
OSHA	Occupational Safety and Health Administration
SSPC	Steel Structures Painting Council
VDOT	Virginia Department of Transportation
WRI	Wire Reinforcement Institute

4. Technical Terms

Materials or work described in words which, so applied, have a well-known technical or trade meaning shall be construed to refer to the technical or trade meaning.

5. Reference to Standards or Specifications

Any material specified by reference to the number, symbol, or title of a specific standard, such as a Commercial Standard, a Federal Specification, a Trade Association Standard, or other similar standard, shall comply with the requirements in the latest revision of the standards or specification and any amendment, or supplement, except as limited to type, class or grade, or as modified in such reference. The standard referred to, except as modified in the contract documents, shall have full force and effect as though printed in the Specifications.

Reference to any article, device, product, material, fixture, form or type of construction by name, make, or catalog number shall be interpreted as establishing a standard of quality and shall not be construed as eliminating from competition other products of equal or better quality by other manufacturers where fully suitable, as determined by the Engineer.

6. Applicable Specifications

The following specifications are incorporated into these standards and specifications by reference. Where the provisions of the referenced specifications conflict with this document, this document shall govern.

- Arlington County Traffic Signal & Streetlight Specifications
- “Manual on Uniform Traffic Control Devices for Streets and Highways” U.S. Department of Transportation, Federal Highway Administration.
- The Arlington County Code
- VDOT Road and Bridge Specifications

7. Applicable Ordinances for Environmental Services and Building Construction

The Contractor or permit holder is responsible for familiarizing himself with the Arlington County Code prior to commencing with any construction. The following codes, in particular, relate to the Environmental Services and building industry:

Chapter 1	General Provisions
Chapter 3	Building Code
Chapter 7	Electrical Code
Chapter 8	Fire Prevention
Chapter 10	Garbage, Refuse and Weeds
Chapter 11	Licenses
Chapter 14	Motor Vehicles and Traffic
Chapter 15	Noise Control
Chapter 18	Plumbing and Gas Codes
Chapter 22	Street Development and Construction
Chapter 23	Subdivisions
Chapter 26	Utilities
Chapter 48	Flood Plain Management
Chapter 55	Underground Utilities Protection
Chapter 57	Erosion and Sediment Control
Chapter 60	Storm water Detention

8. Use of Virginia Department of Transportation Specifications

Virginia Department of Transportation, Road and Bridge Specifications, latest edition, technical specifications only, shall apply and become a part of these specifications whenever these specifications do not adequately cover the work to be done. When VDOT Specifications are applied, the Measurement and Payment sections of those Specifications shall not apply, and Measurement and Payment shall be

performed in accordance with the Arlington County Contract. In the event there is a conflict between these specifications and VDOT Specifications these specifications shall govern.

9. Infeasibility of Specifications

In the event that the Contractor determines that any aspects of the Specifications are infeasible, the Contractor is obligated to immediately notify the Engineer of such infeasibility. If the Engineer agrees that any aspect of the Specifications is in fact rendered infeasible, such determination shall in no way invalidate or otherwise revoke the remainder of the Specifications.

10. Inspection of the Work

The Engineer and representatives of any public authority or public entity shall, at all times, have access to and from the work site during preparation or progress of the work. The Contractor shall provide suitable facilities for such access and for proper observation of the Work and shall conduct all special tests required by the Contract Documents, the Engineer's instructions, and any laws, ordinances, or regulations of any public entity applicable to the Work.

11. Removal and Disposal of Obstructions

Unless instructed otherwise, the Contractor shall remove existing structures, materials and obstructions, whether explicitly identified in the contract documents or not, which interfere with the new construction at no expense to the County. If such structure, material, or obstruction is unanticipated by the Contract Drawings, the Contractor shall notify the Project Officer prior to disturbance. Structures, materials, artifacts, relics, and other obstructions found on the work site shall be the property of the County. Structures and materials not desired by the County shall become the property of the Contractor and shall be disposed of by the Contractor in accordance with all applicable State, Federal, and local regulations. Disposal of such items shall be at no additional expense to the County.

12. Work Site Conditions

The work site shall be kept and maintained by the Contractor in a neat, orderly, and workmanlike appearance at all times. The Contractor shall remove and legally dispose of, as frequently as necessary, all refuse, rubbish, scrap materials and debris generated at the site. At the completion of the work, but before final acceptance by the Engineer, the Contractor shall remove and legally dispose of all surplus materials, false work, temporary structures (including foundations thereof), and debris of every nature resulting from the contractor's operations or any activity associated with the work, and restore the site to a neat, orderly condition. If the Contractor, at any time, fails to maintain the site in a neat, orderly, and workmanlike condition, the County shall have the right, upon 24 hours notification, to remove and dispose of such surplus materials, false work, temporary structures, and debris, and put the site in a neat and orderly condition at the Contractor's expense.

13. Public Convenience

At all times, work shall be conducted so as to ensure the least possible obstruction to traffic and inconvenience to the general public and the properties and residents in the vicinity of the work. No road or street shall be closed to the public except with the specific written permission of the Engineer and the proper governmental authorities. Fire hydrants on or adjacent to the work site shall be kept in operating condition and accessible to firefighting equipment at all times, unless explicitly permitted by the Engineer. Temporary provisions shall be made and provided by the Contractor to ensure the continued use of sidewalks, trails, and transit facilities compliant with all applicable ADA and other regulations.

14. Protection of Work and Property

a. The Contractor shall continuously maintain protection of all its Work from damage and shall protect all public and private property from injury or loss arising in connection with this Work. The Contractor shall make good any such damage, injury, or loss, except such as may be caused by agents or employees of the County.

b. The Contractor shall not place upon the Work, or any part thereof, any loads which are not consistent with the safety of that portion of the Work.

c. The Contractor shall be responsible for the preservation of all public and private property, trees, monuments, etc., except those to be removed or abandoned in place and shall protect carefully from disturbance or damage all monuments and property marks until an authorized agent has witnessed or otherwise referenced their location and shall not remove them until directed. Any damage which occurs by reason of the operations under this Work shall be completely repaired by the Contractor at the Contractor's expense.

d. The Contractor shall shore, brace, underpin, secure, and protect, as may be necessary, all foundations and other parts of existing structures adjacent to, adjoining, and in the vicinity of the site that may be affected in any way by excavations or other operations connected with the work embraced in this Work. The Contractor shall be responsible for the giving of any and all required notices to any adjoining or adjacent property owned or other party before commencement of any work. The Contractor shall indemnify and save the County harmless from any damages on account of settlements or loss of all damages for which the County may become liable in consequence of such injury or damage to adjoining and adjacent structures and their premises.

e. In an emergency affecting the safety of life or of the work, or of adjoining property, the Contractor, without special instruction or authorization from the Engineer or County, is hereby permitted to act, at the Contractor's discretion, to prevent such threatened loss or injury, and the Contractor shall so act without appeal, if so instructed or authorized.

15. Accident Prevention

The Contractor shall exercise proper precaution, at all times, for the protection of persons and property and shall be responsible for all damages to persons and property either on or off the site, which occur as a result of the Contractor's performance of the work. The Contractor shall observe the safety provisions of all applicable laws, including those of the Occupational Safety and Health Administration, and building and construction codes. The Contractor shall take or ensure that such additional safety and health measures are taken as the County may determine to be reasonably necessary. Machinery, equipment, and all hazards shall be guarded in accordance with the safety provisions of the "Manual of Accident Prevention" published by the Associated General Contractors of America, Inc. to the extent that such provisions are not in conflict with applicable local laws. The Contractor shall follow the "Rules and Regulations Governing Construction, Demolition, and all Excavation" as adopted by the Safety Codes Commission of Virginia, 1966, or latest edition, covering requirements for shoring, bracing, and sheet piling of trench excavations.

16. Permission to Work on Highways and Across Utilities

When construction shall proceed to cross highways, railroads, or utilities under the jurisdiction of the State, County, or other public agency, public utility, or private entity, the Contractor shall secure written permission, where necessary, from the proper authority before executing such new construction. A copy of such written permission must be filed with the County before any work is started. The Contractor shall furnish to the Engineer a release from the proper authority before final acceptance of the work.

17. Adjacent Work

In case of a dispute arising between two or more contractors engaged on adjacent work as to the respective rights of each under these specifications, the Engineer shall determine the rights of the parties. The Engineer's decision shall be final and binding on the parties concerned.

18. Connecting Work

The Contractor shall do all cutting, fitting, patching, digging, and other necessary preparations that may be required to make several parts of the work fit properly and/or to receive or be received by the work of other Contractors as shown upon or reasonably implied by the Construction Documents and as directed by the Engineer. The Contractor shall not endanger the integrity of or adversely affect any work by such cutting, fitting, patching, or other preparations. The Contractor shall not alter the work of any other Contractor except with the written consent of the Engineer.

19. Environmental Protection

The Contractor shall implement measures to prevent releases of pollution to the environment and unauthorized discharges to the County's storm drain system or surface waters. The Contractor shall ensure the pollution prevention measures outlined in Section 01500 Erosion and Sediment Control and Pollution Prevention are implemented throughout the duration of the work.

When the work includes an approved Stormwater Pollution Prevention Plan (SWPPP) required under Chapter 60 of the County Code (land disturbance of at least 2,500 square feet), the Contractor shall strictly abide by this SWPPP which includes: a Pollution Prevention (P2) Plan, an Erosion and Sediment Control (ESC) Plan, and a Stormwater Management Plan. If the Contractor proposes to deviate from this approved plan, it shall be the Contractor's responsibility to coordinate and obtain approval from the County Project Officer prior to implementing any changes.

Part 1- GENERAL

1. Purpose of Section

   This section outlines the requirements for submitting and processing the construction schedule, substitutions, shop drawings, samples, and other data which are required for the Engineer's review for conformance with the standards, specifications and contract documents.

2. Related Requirements Specified Elsewhere

   Section 01000 - General Provisions and Requirements

   Section 01400 - Testing

3. Submittals – General Requirements

   a. The Contractor or permit holder shall not begin work which requires the submission of other data, until said submittals are returned with the Engineer's initials or signature indicating review and acceptance.

   b. After any Submittal has been reviewed by the Engineer, no change shall be considered unless satisfactory evidence is presented to prove that the approved Submittal cannot be obtained or that such change is in the County's best interest.

   c. All submittals shall be made so as to cause no delay in the project, allowing reasonable time for review and checking by the Engineer. Except as specified otherwise, all submittals shall be submitted at least ten (10) Business Days before the start of the affected work.

   d. Submittals shall be accompanied by all required certifications and other such supporting materials and in such sequence or in such groups that all related items may be checked together.

   e. When Submittals cannot be adequately reviewed because a submission is incomplete, does not include all necessary appurtenant submittals, has been submitted out of sequence, is illegible, or for any other reason, the Submittal shall be returned by the Engineer without action, or shall be held until such materials as are necessary are received. Incomplete or defective submissions as described above shall not be considered to have been submitted.

   f. Submittals shall have been reviewed by the Contractor and coordinated with all other related or affected work before they are submitted for approval. If the submittals indicate variations from the Contract Documents because of standard shop practice or other reasons, the Contractor shall make specific mention of such variations in the Contractor's letter of transmittal such that, if acceptable, suitable action may be taken for proper adjustment. Otherwise, the Contractor shall not be relieved of the responsibility of executing the work in accordance with the Contract Documents, even if the Submittal was approved.

g. The Engineer shall review the submittals with reasonable promptness. Review and/or approval of submittals shall be general for conformance with the design concept of the project
and compliance with the information given in the Contract Documents. Approval shall not be construed as permitting any departure from Contract requirements, as authorization of any increase in price, as verification of quantities or field conditions, nor as relieving the Contractor of the responsibility for any error in details, dimensions, or otherwise that may exist.

h. The Contractor shall be responsible for the detailed accuracy of the submittals. Deviations in submittals from the requirements of the Contract Documents or the construction standards shall not be relieved unless the Engineer specifically accepts deviations named in writing by the Contractor.

i. Unless otherwise specified, submit three copies of all submittals.

j. Accompany submittals with a transmittal letter containing the following information:

1. Date
2. Project title and number
3. Contractor's and supplier's name and address
4. The number of each shop drawing, product data and sample submitted.
5. Identification of product or material
6. Relation to adjacent structure or material
7. Field dimensions, clearly identified as such
8. Applicable specification section number
9. Applicable standards, such as ASTM number or VDOT specifications.
10. Identification of deviations from Contract Documents
11. Contractor's stamp, initiated or signed, certifying his review of the submittal, verification of field measurements and compliance with Contract Documents.

4. Construction Schedule

Prior to commencing Work, the Contractor shall submit a Construction Schedule with the following information:

a. Work breakdown structure to a level of detail appropriate to the work such that the Engineer may reasonably monitor and determine at any point whether the Contractor is prosecuting the Work as expected.

b. Task dependencies, durations, early and late starts and finishes.

c. Identification of Critical Path tasks.

5. Subcontractors

a. Prior to commencing Work, the Contractor shall submit for approval a list of all Subcontractors which are proposed to be used on the Project. The list shall include the following information for each Subcontractor:

1. Name and address of Subcontractor

2. Contact name, title, and phone number

3. Description of the Subcontractor's qualifications to perform the anticipated Work.

6. Materials & Supplier of Products

Prior to commencing Work, the Contractor shall submit for approval a list of all Suppliers and Products which are proposed for installation. The list shall be tabulated by applicable Specification section or related trades or construction activities.

7. Substitutions

a. The Engineer shall consider formal requests for substitution of products in place of those specified up to fifteen Business Days before the start of work.

b. All proposals for substitutions shall be submitted in writing by the General Contractor or permit holder and not by individual trades or material suppliers.

c. Include in the following information in any Substitution request:

1. Complete data substantiating compliance of proposed substitution with Contract Documents.

2. Product identification, including manufacturer's name, address and literature outlining the product description, performance, test data and reference standards.

3. Samples, if applicable.

4. Name and address of similar projects on which product was used and date of installation.

5. Itemized comparison of proposed substitution with product or method specified including any changes in construction schedule, relation to separate contracts, and accurate cost data on proposed substitution in comparison with product or method specified.

d. If any proposed Substitution shall affect any portion of the Project, adjacent construction, work of other Contractors or Subcontractors, or use or functionality of the finished Project, then the necessary changes to or affected functionality of the Project shall be considered as

an essential part of the proposed Substitution. All such changes or accommodations necessary to restore and/or provide the intended functionality of the Project shall be clearly documented by the Contractor as part of the Submittal.

e. The County shall bear no additional expense as a result of any Substitution.

f. The Engineer shall review proposed substitutions and make his recommendations in writing within ten working days. The Contractor shall abide by the Engineer's recommendations when proposed substitute materials or items of equipment are not accepted for installation and shall furnish the specified material or item of equipment in such case.

8. Shop Drawings

a. Submit drawings, prepared by Contractor, subcontractor, supplier or distributor, which illustrates some portion of the work; showing fabrication, layout, setting or erection details.

b. Identify details by reference to sheet and detail numbers shown on Contract Drawings or the Construction Standards.

c. Use a minimum sheet size of 8 ½ inches x 11 inches.

d. When submitting specific product data, catalog sheets, or the manufacturer's standard schematic drawings, modify the submissions to delete information which is not applicable to the project. When required, supplement the standard information to provide additional information applicable to project.

e. Show dimensions and clearances required.

f. Show performance characteristics and capacities, where applicable.

g. Note clearly on the drawings any deviations from the material or equipment as specified.

h. The Engineer shall review the Shop Drawings with reasonable promptness.

i. Contractor shall submit 6 (six) copies of all submittals/shop drawings.

j. The Engineer shall review the Shop Drawings within ten (10) Business Days.

9. Samples

a. Where required, provide physical examples to illustrate materials, equipment or workmanship, and to establish standards by which completed work is to be judged in such quantities and locations as required by the specifications.

b. Samples shall be submitted in single units, unless specified otherwise.

c. Materials and equipment incorporated into the Work shall match the approved Samples.

10. Resubmissions Requirements

If Submittals are disapproved or require revision, revise the initial submittal and resubmit as specified for initial submittal. Indicate on re-submittal any changes which have been made other than those requested by the Engineer.

11. Pavement Restoration Limit

Contractor shall submit the extent of the pavement restoration to the County for approval, prior to any saw cuts and/or milling and paving to the existing pavement.

PART 1 - GENERAL

1.1 Purpose of Section

This section outlines the requirements for testing and verification of work, materials, and any other miscellaneous items required by the Contract Documents.

1.2 Related Requirements Specified Elsewhere

Section 01300 – Submittals

PART II - MATERIALS

PART III - EXECUTION

3.1 General Requirements

A. Materials, supplies, equipment, and work shall be fully tested in accordance with the Contract Documents. Unless otherwise noted within the specification section, perform the type and number of tests called for by the standards referenced.

B. Testing shall be done by an independent testing laboratory approved by the Engineer.

C. Certifications of testing and inspections by the testing laboratory, mills, shops, and factories shall be submitted per Section 01300.

D. The Contractor shall provide the necessary labor and supervision required to support field testing and inspection by the Engineer at no additional cost to the County. Defects disclosed by tests shall be rectified at no additional cost to the County.

E. Testing and inspection of the Work shall not relieve the Contractor of his responsibility for conforming to the requirements of the Contract Documents.

PART IV – MEASUREMENT AND PAYMENT

4.1. Testing

1. Unless otherwise specified, testing of materials, supplies, equipment, and work to comply with the Contract requirements shall be considered incidental to the work, and the Contractor shall not be entitled to further payment. The County may direct additional testing in excess of the Contract requirements at the County's expense, unless such testing reveals non-compliant work, in which case the Contractor shall bear the cost of the testing.

PART 1 – GENERAL

Description of Work

This work shall consist of implementation of erosion and sediment control and pollution prevention measures throughout the duration of the work to prevent unauthorized non-stormwater discharges or pollution releases to the storm drain system or surface waters.

Where work is governed by an approved Stormwater Pollution Prevention Plan (SWPPP), the Erosion and Sediment Control and Pollution Prevention components of the SWPPP shall apply.

Erosion and sediment control measures shall include, but are not limited to, the use of berms, dikes, dams, sediment basins, fiber mats, silt fences, straw bales, washed gravel or crushed stone, mulch, grasses, slope drains, temporary seeding, and other methods. Erosion and sediment control measures shall be applied to erodible material exposed by any activity associated with the construction, and consistent with federal, state and local regulations.

All non-stormwater discharges to the County's storm drain system, which includes the curb and gutter as well as the underground pipe network, or any open watercourse must comply with the conditions of the County's Virginia Stormwater Management Program, Municipal Separate Storm Sewer System (MS4) Permit. Examples of unauthorized non-stormwater discharges include but are not limited to, wash water, slurry runoff from saw cutting, discharges associated with vehicle, equipment, and/or material washing, concrete wash water, process water, waste water, leaks from portable lavatories, equipment, vehicles and/or waste receptacles. Only clear, uncontaminated stormwater discharges and/or permitted non-stormwater discharges (as specified in a Virginia Pollutant Discharge Elimination System (VPDES permit)) are allowed to be discharged to the storm drain system or surface waters. Contaminants, including but not limited to, volatile organic compounds, petroleum products, metals, PCBs/Pesticides shall not be discharged to the County's storm sewer system.

1.3 Related Work Specified Elsewhere

Section 02100- Clearing and Grubbing

Section 02200- Earthwork

1.4 Applicable Regulations

Erosion and Sediment Control (Chapter 57 of the Arlington County Code)

Utilities (Chapter 26 of the Arlington County Code)

Stormwater Management (Chapter 60 of the Arlington County Code)

Chesapeake Bay Preservation Ordinance (Chapter 61 of the Arlington County Code)

Trees and Shrubs (Chapter 67 of the Arlington County Code)

Virginia State Water Control Board Regulations

1.5 Applicable References

Virginia Erosion and Sediment Control Handbook

Arlington County Stormwater Management Ordinance Guidance Manual

Arlington County Planning Guide to Erosion and Sediment Control

Arlington County Pre-Storm Erosion and Sediment Control Checklist

Arlington County Planning & Field Guide for Pollution Prevention (P2)

Arlington County Tree Protection and Planting Standards

1.6 Submittals

Prior to the start of any work that does not require a Land Disturbing Activity (LDA) and SWPPP, the Contractor shall prepare and submit a plan for implementing erosion and sediment control and pollution prevention measures. The plan shall include, but is not limited to, the operations of clearing and grubbing, stripping of topsoil, grading, stabilizing cleared areas, dewatering, spill prevention and cleanup, and the construction of structures at watercourses.

Any activity that disturbs greater than or equal to 2500 square feet requires a Stormwater Pollution Prevention Plan per the requirements of Arlington County Code Chapter 60. This plan contains the following elements:

- Erosion and Sediment (E&S) Control Plan
- Pollution Prevention Plan (P2 Plan)
- Stormwater Management Plan (SWMP)
- Virginia Stormwater Management Program (VSMP) Requirements where applicable

Construction work shall not commence until the schedule of work and the methods of operations have been reviewed and approved by the Engineer / Project Officer.

Erosion and sediment controls shall be coordinated with the construction of permanent stormwater management facilities, drainage facilities and other contract work to the extent practicable to assure economical, effective, and continuous erosion and sediment control, and to prevent any damage, clogging, or other negative impacts upon the Work or other property.

Where work is governed by an approved SWPPP, the Contractor shall be responsible for all SWPPP self-inspection and documentation requirements.

Where work is governed by an approved SWPPP, the Contractor shall be responsible for all SWPPP self-inspection and documentation requirements which includes but is not limited to the following:

- A SWPPP box is installed and maintained at project site.
- Permit(s) and applicable documentation are posted near the SWPPP box.
- All sections of the SWPPP are kept complete and up to date throughout the duration of the project. (For example, notation of when erosion and sediment controls (ESC) are installed and information about the types of pollution prevention measures used.)
- Any modifications to controls are documented in the SWPPP, which includes the ESC plan.
- Self-inspections are conducted every four business days or as required.
- Completed and signed inspection reports are kept at the project site.
- Items identified during inspections requiring correction action are properly documented and addressed.
- The ESC Pre-storm checklist provided in the plan / SWPPP is used and followed accordingly.

1.7 Permits

The Contractor is responsible for complying with all applicable State, Federal, and Local permits which are required for construction, including, but not limited to:

- Virginia Water Protection Permits issued by the Virginia DEQ
- General Nationwide Permits issued by the US Army Corps of Engineers
- Land Disturbing Activity (LDA) permits (Virginia Stormwater Management Program (VSMP) authority permits) issued by Arlington County
- General Virginia Pollutant Discharge Elimination System (VPDES) Permit for Discharges of Stormwater from Construction Activity issued by Virginia DEQ.

A separate VPDES permit, issued by DEQ may be required for certain non-stormwater discharges such as contaminated groundwater.

Unless otherwise specified as the responsibility of the Contractor in the ITB or contract documents, the County shall obtain all applicable permits prior to awarding the contract. Permits shall then be transferred to the Contractor.

PART 2 - MATERIALS

Materials shall be at the Contractor's option with the approval of the Engineer/Project Officer in accordance with Arlington County Code, Erosion and Sediment Control Ordinance (Chapter 57).

PART 3 - EXECUTION

3.1 Installation and Maintenance of Erosion and Sediment Controls

Where work is governed by an approved SWPPP, the contractor shall follow the plan and Erosion and Sediment Control Pre-Storm Checklist, which includes but is not limited to the conditions below. Where the work is not governed by an approved SWPPP, the contractor shall meet the conditions below as well as those specified in the Erosion and Sediment Control Pre-Storm Checklist.

A. The Contractor, prior to starting work, shall properly protect storm drains to prevent pollutants, waste materials, sediment, or non-stormwater discharges from entering the storm drain system. The Contractor shall implement and maintain controls as specified in the Virginia Erosion and Sediment Control Handbook and/or approved Stormwater Pollution Prevention Plan. Controls, practices, and/or devices must be monitored and maintained at all times to ensure proper operation condition.

B. No grading operations shall be allowed until erosion and sediment controls have been installed in accordance with the approved plan conforming to the requirements of Virginia Erosion and Sediment Control regulations and Arlington County Erosion and Sediment Control Ordinance.

C. The Contractor shall keep stockpiled materials covered and perimeter controls shall be employed to minimize exposure to wind, precipitation, and runoff.

D. The Contractor shall implement and maintain dewatering methods as specified in Arlington County Construction Standards and Specifications, VA Erosion and Sediment Control Handbook, Arlington County Planning & Field Guide to Erosion and Sediment Control, Arlington County Planning & Field Guide for Pollution Prevention (P2) and/or approved Stormwater Pollution Prevention Plan. Controls, practices, and/or devices used for dewatering operations must be monitored and maintained at all times to ensure proper operation.

E. The Contractor shall conduct dewatering operations in a manner to prevent sediment or other pollutants from discharging to the County's storm drain system, which includes the curb and gutter, or any surface water. Dewatering operations shall not create any erosion or flooding. Dewatering discharges that contain chemicals, hydrocarbons, or sewage shall not be discharged to the storm drain system. Any discharge from dewatering operations shall be properly filtered prior to being discharged. A dewatering plan with sufficient detail to ensure the proposed dewatering shall comply with applicable regulations must be included as part of the erosion and sediment control plan.

F. The Contractor is responsible for the installation and maintenance of any additional erosion and sediment control (ESC) measures necessary to prevent erosion and sedimentation as determined by the County, including but not limited to the actions listed in the County's Erosion and Sediment Control Pre-Storm Checklist (perimeter controls, slope stabilization, and covering stockpiles). Erosion and sediment controls shall be modified as needed to ensure clear water is discharged from the site. The County reserves the right to order the implementation of other erosion and sediment controls not specifically described herein to correct an erosion or pollution discharge condition.

G. Control measures shall be properly maintained in accordance with state and local regulations. Immediately after every rainstorm, all control measures shall be inspected, and any deficiencies corrected by the Contractor.

H. Erosion and sediment controls shall be removed when the area has been stabilized and approval has been granted by the construction inspector.

I. No further work shall be allowed until erosion and sediment controls for the applicable phase have been installed in accordance with the approved plan conforming to the requirements of Virginia Erosion and Sediment Control regulations and Arlington County Erosion and Sediment Control Ordinance.

3.2 Pollution Prevention Measures

Where work is governed by an approved SWPPP, the contractor shall follow the plan, which includes but is not limited to the conditions below. Where the work is not governed by an approved SWPPP, the contractor shall meet the conditions below.

A. The Contractor shall employ good housekeeping at work sites at all times. The Contractor shall collect, remove and legally dispose of all refuse, trash, litter, waste materials, and/or debris generated at the work site as frequently as necessary to prevent pollution releases from the site. Liquid waste must be properly contained prior to being placed into a waste receptacle to prevent leaking. The County, in its sole discretion, may require the Contractor to provide disposal tickets or other information sufficiently demonstrating legal disposal.

B. The Contractor shall contain, capture, collect and legally dispose of any unauthorized non-stormwater discharge(s), including but not limited to, saw cut slurry from saw cutting operations, concrete / asphalt wash water, waste water, and / or wash water from equipment, material, and/or vehicle washing.

C. A vacuum system shall be used to collect liquid waste / slurry generated from saw cutting operations to prevent a discharge to a storm drain or surface water. Collected slurry must be disposed of at an approved waste receiving facility (e.g. landfill, soil safe, waste water treatment plant, commercial dump pad).

D. Methods used for capturing / collecting unauthorized non-stormwater discharges must be on site and operational prior to starting any work that shall generate a non-stormwater discharge.

E. The Contractor shall have designated wash out areas or containers for materials, including but not limited to concrete, asphalt, paint, grout, mortar, stucco, form release oil, curing compounds, and /or sealers.

F. Construction materials shall be properly stored and secured to ensure no pollutants are released into the environment.

G. The Contractor shall ensure waste receptacles and portable lavatories are not damaged and/or leaking.

H. The Contractor shall ensure spill clean-up materials (including but not limited to absorbent materials, spill pads, rags, booms, bags for waste disposal) and tools (including but not limited to shovels, brooms, containers, vacuums) are kept on the work site and accessible at all times. Spills and leaks shall be cleaned up as soon as discovered and wastes properly disposed of at an approved waste receiving facility. Spills shall not be washed into a street, storm drain, or surface waters.

I. The Contractor shall ensure that the County's procedures for disposing of chlorinated water are followed (DES Construction Standards and Specifications, Section 02550 4.12 Discharge of Chlorinated Water).

J. The Contractor shall not dump or dispose of anything in a storm drain, street, or stream that is not authorized under the County's VSMP MS4 permit or violates County Code Chapter 26-5 B and/or C.

3.3 Extent of Grading Operations

A. The Contractor shall limit the surface area of earth material exposed by grubbing, stripping of topsoil and excavation to that which is necessary to perform the next operation within a given area.

B. Unless specifically authorized by the Project Officer, the grubbing of root mat and stumps shall be confined to the area over which excavation is to be actively conducted within 30 days following the grubbing operations.

C. The stripping of topsoil shall be confined to the area over which excavation is to be actively prosecuted within 15 days following the stripping operations; and excavation and embankment construction shall be confined to the minimum area necessary to accommodate the Contractor's equipment and work force engaged in the earth moving work.

D. No disturbed area, including stockpiles, shall remain denuded longer than 7 days without temporary seeding or application of other stabilization practices approved by the Project Officer.

3.4 Tree Protection

A. The Contractor shall ensure the specifications in the County's Tree Protection and Planting Standards are followed throughout the duration of the work.

B. The Contractor shall protect all existing trees within a Tree Protection Zone.

PART 4 - MEASUREMENT AND PAYMENT

4.1 Measurement and Payment

a. Temporary Erosion and Sediment Controls as detailed on the approved plan and shall be paid as indicated on the bid form.

b. SWPPP administration, as detailed by these specifications and as required by all applicable State and Local Regulations, shall be paid as a lump sum invoiced incrementally as approved by the Project Officer.

c. Unless otherwise specified, no separate payment shall be made by the County for maintenance of erosion and sediment controls or implementation of the pollution prevention measures specified on an approved plan, methods, or sequence of work; this work is considered to be a subsidiary obligation to the Contract. No separate payment shall be made by the County for erosion and sediment controls or

pollution prevention measures required to correct conditions created due to the Contractor's negligence, carelessness or failure to install or properly maintain controls in accordance with approved plans.

d. No separate payment shall be made by the County for changes to the plans which are the result of the Contractor's work schedule or resource allocation, weather delays, or other factors not controlled by the County.

e. Unless otherwise specified, no separate payment shall be made by the County for implementation of spill clean-up, hauling fees, and/or collection, handling, transport and legal disposal of unauthorized non-stormwater discharges (slurry, waste water, wash water) and/or other waste materials; this work is considered to be a subsidiary obligation to the Contract.

f. In the event the Contractor repeatedly fails to satisfactorily control sediment and pollution releases, the County reserves the right to employ outside assistance or to use its own forces to provide the corrective measures indicated; the cost of such work, plus engineering costs, shall be deducted from payments due to the Contractor for other work.

PART 1 – GENERAL

1.1 General

This work shall consist of furnishing and setting-up a temporary field office building for the sole use of the County.

The building shall be weather-tight, installed plumb and level, and provided with the following as a minimum:

1. 240 square feet of floor space
2. Above ground floor
3. Air conditioning and heating to maintain an ambient temperature of 75 deg. F in summer and 68 deg. F in winter
4. Utility service (electricity, DSL or broadband internet connection, water and sewer)
5. Adequate windows
6. Six square feet of shelving
7. Plan table: 3 feet 6 inches deep by 6 feet wide by 3 feet 3 inches high
8. Fire Extinguisher
9. Water cooler
10. Drafting stool
11. Conference table: 4 foot by 8 foot
12. Four chairs
13. Cylinder door lock and six keys
14. Sanitary facilities (unless existing facilities are available)
15. Adequate janitorial service (removal of waste, etc.)

The field office shall be set up in an acceptable location, and in proximity to sewer/water lines when practicable. It is the Contractor's responsibility to secure the location of the field office. The field office shall be equipped and completely operational for use three days prior to start of any work, and shall remain at the site until field records pertinent to the project have been completed, not to exceed 30 calendar days after acceptable completion of all Contract work.

The Contractor shall make provision for water meter and electric meter installation prior to use of the office. Utility bills shall be paid by the Contractor and a copy of each paid bill submitted to the Engineer

Access from a public street together with adjacent gravel paved parking area for not less than three cars shall be provided at the Engineer's field office.

Upon completion of the Contract, the office and furnishings supplied by the Contractor shall remain the property of the Contractor and be removed from the site. The Contractor shall restore the grounds in the vicinity of the trailer as well as restore the trailer utilities to their original condition.

The Contractor may utilize existing office spaces near the project site to house the field office. All Arlington County building and zoning requirements shall be met.

PART 2 – MATERIALS (NOT USED)

PART 3 – EXECUTION (NOT USED)

PART 4 – MEASUREMENT AND PAYMENT

Field office building shall be paid as a lump sum.

The lump sum contract price for field office building shall be the full compensation for all work described in this section including all labor, materials, tools, equipment, transportation, supplies, and incidentals required to furnish, install, and maintain the field office building.

The first progress payment for the project shall not be made until the field office building and associated utilities are complete and operating.

PART 1 - GENERAL

This work shall consist of performing preliminary operations, including moving personnel and equipment to the project site; paying bonds and insurance premiums; and establishing facilities necessary to allow work to begin on a substantial phase of the Contract.

PART 4 - MEASUREMENT AND PAYMENT

Payment for mobilization shall be based on the bid form. The cost of mobilization shall be expressed in the bid tab as a percentage of the total bid less the contract percentage items. This price shall also include demobilization.

Payment for mobilization shall be made in two equal installments. The first installment of 50% of the total cost for mobilization shall be made on the first progress estimate following partial mobilization and initiation of construction work. The second installment shall be made on the next progress estimate following completion of substantial mobilization.

PART 1 - GENERAL

1.1 Purpose of Section

This section outlines the requirements for keeping record drawings (As-Built Drawings) and other data in accordance with the General Conditions and in accordance with the following specifications.

1.2 Record Drawings

A. The Contractor shall maintain one complete set of drawings specifically for the purpose of recording changes during the construction of the project. During the course of construction, the Record Drawings shall be updated daily by the end of each working day.

B. Record Drawings shall be neat, accurate and complete. The Record Drawings shall be available for periodic inspection by the Engineer.

C. Record Drawings shall include the following, as a minimum:

1. Details not shown on original Contract Drawings.
2. Actual locations (horizontal and vertical) of all utilities uncovered during the course of the work.
3. Any changes in grade and location of duct banks and appurtenances.
4. Any changes, additions or deletions made by Change order or Addenda.
5. Final coordinates of all structures built or modified under this Contract.

D. The Contractor shall certify the Record Drawings as accurate and complete.

1.3 Submission Requirement

The Contractor shall submit the Record Drawings (both in digital format and 2 full size hardcopy sets) to the Project Officer upon substantial completion of the Project. Final payment shall not be issued until the Record Drawing has been accepted by the Project Officer. The Contractor shall make any necessary corrections and resubmit until acceptable to the County Project Officer.

PART 4 - MEASUREMENT AND PAYMENT

Project Record Documents are considered a subsidiary obligation of the contract, and therefore no payment shall be made for this work.

PART 1 - GENERAL

1. Description of Work

   Provide all labor, material and equipment to perform all clearing and grubbing as called for on the approved plans and as specified herein, or as necessary to prosecute the Work.

2. Related Work Specified Elsewhere

   Section 01500 – Temporary Erosion and Sediment Control

   Section 02200- Earthwork

3. Applicable Specifications

   Erosion and Sediment Control Ordinance (Chapter 57 of the Arlington County Code)

   Garbage, Refuse and Weeds Code (Chapter 10 of the Arlington County Code)

   American Association of Nurserymen (A.A.N.)

   International Society of Arboriculture (I.S.A.) National Arborist Association (N.A.N.)

4. Protection of Vegetation

   a. Protect existing trees, shrubs and bushes outside the limits of clearing and grubbing by fencing or barricading as required by the Urban Forester (DPRCR). Protect existing trees designated to be saved inside the limits of clearing and grubbing by methods approved by the Urban Forester (DPRCR), which may include tree protection fencing, root pruning, and/or protective matting.

   b. Trees damaged by construction operations shall be evaluated by the Urban Forester (DPRCR) and replaced, pruned, and/or treated. Pruning or treatment must be performed by an International Society of Arboriculture (I.S.A) Certified Arborist.

   c. Replace trees damaged beyond repair by the construction process with nursery grown stock meeting American Association of Nurserymen (A.A.N.) Standards. Trees shall be replaced per the County's tree replacement guidelines.

5. Protection of Property

   a. Protect property pipes, stones and monuments from damage. The Contractor shall be responsible for replacing disturbed markers by a registered surveyor at no expense to the County.
   b. Protect street, roads, historical objects, adjacent property, vegetation and other works to remain throughout the contract.

PART 2 - MATERIALS

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PART 3 - EXECUTION

6. Clearing

The area of clearing (limits of disturbance) shall be maintained within the limits shown on the plans. The Contractor shall ensure the specifications in the County's Tree Protection and Planting Standards are followed throughout the duration of the work. Trees and other vegetation that shall not be removed shall be properly protected to avoid damage and limit adverse impacts. Protection devices around tree protection areas shall be installed and maintained throughout the duration of the work as directed by the Urban Forester (DPR). There shall be no disturbance inside the boundaries of the tree protection area. Equipment and materials may not be stored inside tree protection areas.

7. Grubbing

The area of grubbing shall be maintained within the clearing limits shown on the plans. Remove stumps and matted roots to a depth of 24 inches below existing ground surface. Refill excavations made by removal of stumps or roots as specified for backfill in Section 02200.

8. Trimming of Trees

a. Trees may be trimmed to remove branches or roots which interfere with construction when so approved by the Engineer and Urban Forester (DPRCR). All trimming and pruning shall conform to specifications and standards of practice of the National Arborist Association.

b. Do not unnecessarily cut tree roots extending into grading limits. When roots are exposed by the work, cut them back cleanly with hand pruning shears, lopping shears or hand saws, and backfill with approved topsoil immediately. Backfill around tree roots immediately after completion of construction in vicinity of the trees. Backfill around trees and roots shall be compacted to no more than 80% unless otherwise directed by the Engineer.

9. Salvage

a. Unless otherwise indicated on the plans, remove only those trees which directly interfere with the construction of the project. Trees designated by the Engineer to be salvaged shall be either mechanically dug with a tree spade or hand dug, balled and burlapped with root ball sizes as specified by the American Association of Nurserymen.

b. Material which is to be salvaged, as a result of clearing operations, shall include live plants suitable for replanting. Shrubbery is to be transplanted as trees using A.A.N. Standards. If required, temporarily replant the shrub and at the completion of construction replace according to A.A.N. Standards.

c. Place any desirable topsoil in well-drained stockpiles, not to exceed 7 feet in height, and protect per Section 01500

10. Disposal

a. Dispose of trees and shrubs in accordance with the Garbage, Refuse and Weeds Ordinance of the Arlington County Code. When approved by the Engineer, material may be dumped within the Contract area where directed.

b. Do not burn materials on the site. The County Fire Marshal may consider granting a waiver from open burning restrictions in cases where the State Air Pollution Control Board has granted a waiver to the Contractor or permit holder. The responsibility for obtaining all waivers shall be the Contractor's or permit holders.

c. Remove material from the site as it accumulates. Do not allow waste material to accumulate for more than 48 hours.

PART 4 - MEASUREMENT AND PAYMENT

No separate measurement of quantities shall be made for this work. Clearing and grubbing is considered to be a subsidiary obligation of the contract and, therefore, no separate payment shall be made for this work.

The removal of any designated tree smaller than 6" DBH shall be consider clearing and incidental to the WORK. Therefore, no separate payment shall be made for the removal of any tree smaller than 6" DBH.

PART 1 - GENERAL

1. Description of Work

   Provide all labor, material and equipment to perform all excavation, transportation, handling, disposal, placement, shaping, compaction, and other tasks pertaining to earthwork for the structures, pipelines, roadways, and other work as called for on the approved plans and as specified herein.

2. Related Work Specified Elsewhere

   Section 01500 – Temporary Erosion & Sediment Control

   Section 02100 - Clearing and Grubbing

   Section 02202 - Rock Excavation

   Section 02400 - Sheeting, Shoring and Bracing

   Section 02650 - Restoration of Roadway

3. Applicable Specifications

   a. American Association of State Highway and Transportation Officials (AASHTO)

   b. American Society for Testing and Materials (ASTM)

   c. Occupational Safety and Health Act, State & Federal (OSHA)

   d. Underground Utility Protection Ordinance (Chapter 55 of the Arlington County Code)

   e. Erosion and Sediment Control Ordinance (Chapter 57 of the Arlington County Code)

   f. Virginia Department of Transportation, Road and Bridge Specifications (VDOT)

4. Underground Utilities

   The location of existing utilities has been indicated on the drawings based on the best information available. The completeness or accuracy of the information is not guaranteed. Contractor shall notify "Miss Utility" in accordance with the provisions stipulated in the Underground Utility Protection Ordinance (Chapter 55), of the Arlington County Code.

5. Overhead Utilities

   The Contractor shall identify and protect all existing overhead utility poles and facilities in the vicinity of the Work. The Contractor shall be solely responsible for all necessary notification and coordination with the utility owner(s). There shall be no payment made for necessary bracing, sheeting, shoring, or other work required to protect and maintain existing utility poles or overhead utilities.

6. Existing Foundations

When foundations are located such that excavation may endanger or interfere with an existing structure or utility, the Contractor shall take all measures necessary to protect the existing utilities or structures. There shall be no payment made for these measures.

7. Stability of Excavations

The Contractor shall be solely responsible for the stability of excavations and for meeting all State and Federal OSHA requirements. Provide all sheathing, lagging, bracing, and other support required to retain the stability of excavations.

8. Care and Restoration of Pavement and Property

When excavations are to be made in paved surfaces, the Contractor shall sawcut or use of a similar tool so as to provide a clean, uniform edge with a minimum of disturbance to remaining pavement. Pavement and other property outside of the defined Limits of Disturbance shall be preserved in the condition existent prior to construction. Damage or other impacts upon pavement or property outside the Limits of Disturbance shall be restored immediately at the Contractor's expense.

9. Construction Tolerance

Compact, shape, slope, and dress to yield the grades and slopes illustrated on the approved plans. In backfilled or other non-paved areas, grades shall be within 0.10 foot of the design grade. Slopes shall not be steeper than 2(H):1(V) and shall not deviate from a theoretical plane surface by more than 0.5 feet.

10. Saw Cutting

A vacuum system shall be used to collect liquid waste / slurry generated from saw cutting activities. Collected slurry must be hauled off and disposed of at a proper waste receiving facility (e.g. landfill, soil safe, waste water treatment plant, commercial dump pad).

PART 2 - MATERIALS

11. Backfill

Backfill shall be free of vegetation, masses of roots, and stones over 3-inches in any dimension, frozen material, cinders, ashes, refuse, or porous matter. Organic matter shall not exceed minor quantities and shall be well distributed. In addition, Backfill shall be of such a nature and in such condition that it can be compacted to a dense and stable fill.

12. Topsoil

a. Topsoil furnished by the Contractor shall consist of a natural friable surface soil without admixtures of subsoil, refuse, or foreign materials. It shall be reasonably free from roots,

hard clay, coarse gravel, stones larger than 2 inches in any dimension, noxious weeds (including quack grass rhizomes and the nut-like tubers of nut sedge), tall grass, brush, sticks, stubble, or other materials which would be detrimental to the proper development of vegetative growth.

b. Topsoil shall contain not less than 3% nor more than 10% organic matter by weight.

c. The Contractor shall Submit per Section 01300 to the Project Officer a soil analysis describing the soil composition including pH factor and percentage of organic content prior to placing any Topsoil.

13. Select Borrow

Select Borrow shall conform to VDOT Section 207 – Select Material, Type I.

14. Inspection of Materials

The Project Officer shall determine the feasibility or suitability of soils based upon testing provided by the Contractor and any other relevant information. The Project Officer's decision shall be final.

PART 3 - EXECUTION

15. Location & Protection of Existing Structures & Utilities

a. Locate all utility pipes, conduits and facilities well ahead of the excavation process. Plainly mark all such locations and comply with the Underground Utility Protection Ordinance (Chapter 55), of the Arlington County Code.

b. Where the Contractor has identified or anticipates existing utilities, structures, or artifacts, excavate using hand tools or other labor intensive activity as necessary to protect the facilities. No extra compensation or time shall be allowed for this activity

c. In case of damage caused by the Work, notify the owner or appropriate agency or party and affect repair in a manner resulting in a condition at least equal to the condition prior to construction. No extra compensation or time shall be allowed for repair of damages.

16. Trench Excavation

a. Carry out the excavation, dewatering, sheeting, and bracing in such manner as to eliminate any possibility of undermining or disturbing the foundations of any existing structure, utility, facility, or any work previously completed.

b. Excavate pipe trenches to the necessary depth as shown on the drawings, holding the width below top of pipe as shown in the Standard Details.

c. The Contractor shall comply with all OSHA and/or other applicable regulations for excavation.

d. Excavate trenches to provide a uniform and continuous bearing and support for the pipe and appurtenant structures on solid and undisturbed ground and at the specified grade at every point.

e. Correct any part of the trench bottom excavated below the specified grade with approved materials and thoroughly compact. Shape the bottom of all pipeline trenches to fit the lower part of the pipe exterior for a width of a least 60% of the pipe breadth. Shape the excavation and/or bedding for pipe bells, joints, and fittings. Care shall be taken that stones and lumps shall not become nested.

f. Should an unacceptable bedding for the proposed pipe or structure be encountered, notify the Engineer. The Engineer may direct additional excavation below the bottom of the proposed pipe or structure and direct the contractor to provide an alternate bedding or foundation. Additional excavation due to the fault or negligence of the Contractor or without prior approval from the Engineer shall be remedied at the expense of the Contractor.

17. Sheeting, Shoring, and Bracing

Provide sheeting, shoring and bracing in accordance with Section 02400.

18. Storage, Handling, and Disposal of Excavated Materials

a. Carefully remove loam and topsoil to be incorporated in the finished work and store separate from the other excavated material. Failure to isolate loam and topsoil from the other excavations shall require that said soils not be used as topsoil.

b. Excavation shall include the disposal of material deemed unsuitable by the Project Officer for reuse in the Work. The Contractor shall stockpile, treat, and/or otherwise manipulate suitable materials which may be incorporated into the project at a later date or different location. The Contractor is responsible for protecting any stockpiled material from contamination by unsuitable material and from degradation by any other means. Failure by the Contractor to adequately handle and protect excavated material shall result in the Contractor being directed to use Select Borrow or other approved material at no expense to the County. Unless otherwise specified, the Contractor shall be solely responsible for securing the necessary area for stockpiling, treating, protecting, and related activities.

c. Do not mix pavement with other excavated material. Dispose of excavated pavement away from the work site immediately. All costs associated with removing, handling, transporting, disposing, etc. of existing pavement, curb and gutter, sidewalks, driveway aprons, etc. is considered to be incidental to Excavation and no additional compensation shall be considered for such activities.

d. All materials deemed unsuitable for use in the Work by the Project Officer shall be disposed of by the Contractor at his own expense. Storing, transporting, loading, handling, treating, and other associated costs are considered to be incidental to the Work and no additional compensation shall be considered for such activities.

e. The County shall take preference over others in claiming excavated material. The Contractor shall consult the Engineer before disposing of such materials.

f. If space is available at the County's Trades Center, the Contractor may be directed to dispose of clean excavated asphalt and/or unreinforced concrete pavement there, at no cost to the Contractor or the County. If space is not available at the Trades Center, the Contractor shall be responsible for alternate disposal arrangements. No additional compensation shall be made

if the Trades Center does not have adequate space to accommodate materials from the project.

19. Dewatering

At all times during construction the Contractor shall keep all excavations dry and promptly remove all water entering trenches and other excavations until the structures, pipes, and appurtenances to be built therein have been completed and backfilled. Dispose of all water pumped or drained from the work without impact to the Work, traffic, or injury to public or private property, and in compliance with all Local, State, and Federal regulations.

The Contractor shall implement and maintain dewatering methods as specified in Arlington County Construction Standards and Specifications, VA Erosion and Sediment Control Handbook, Arlington County Planning & Field Guide to Erosion and Sediment Control, Arlington Planning & Field Guide for Pollution Prevention (P2) and/or approved Stormwater Pollution Prevention Plan. Controls, practices, and/or devices used for dewatering operations must be monitored and maintained at all times to ensure proper operation condition.

The Contractor shall conduct dewatering operations in a manner to prevent sediment or other pollutants from discharging to the County's storm drain system, which includes the curb and gutter, or any surface water. Dewatering operations shall not create any erosion or flooding. Dewatering discharges that contain chemicals, hydrocarbons, or sewage shall not be discharged to the storm drain system. A dewatering plan with sufficient detail to ensure the proposed dewatering shall comply with applicable regulations must be included as part of the erosion and sediment control plan.

20. Backfilling – General

a. If the Project Officer determines that sufficient approved material from excavation on the job-site is not available for backfill, the Contractor shall secure material from areas outside the job-site to complete the backfill.

b. All backfill materials shall contain sufficient moisture for proper compaction.

c. Except in proposed landscape areas, or where otherwise specified, each layer of material shall be compacted to a dry density not less than 95 percent of the maximum determined by the Modified Proctor Compaction Test. Upon completion of backfilling in any area under the contract, the Owner may make tests to determine the degree of compaction of the backfill

material. If the results of test indicate densities less than specified, the Contractor shall, at his own expense, remedy the condition as directed, in such portions of the trenches as may be required.

d. Backfill all excavations as rapidly as practicable after the completion of each section of the work. All unauthorized excavations made by the Contractor shall be immediately backfilled at the Contractor's expense. Complete all backfilling to the dimensions and levels shown on the drawings.

e. The placement of material around structures shall be carried out symmetrically around the structure in horizontal lifts not to exceed six inches of loose material. The Contractor shall protect, and be responsible for any damages to adjacent structures or utilities.

f. Start backfilling around concrete structures only after the concrete has reached sufficient strength to withstand the pressure exerted by the material and compacting equipment and after carrying out and satisfactorily completing the tests specified in Section 03100, Concrete Formwork, Reinforcement and Materials.

g. At points which cannot be reached by mobile mechanical equipment, use suitable power-driven tampers to achieve the same degree of compaction.

h. No material shall be placed or compacted when it is wet or frozen or when the sub grade or previously placed material is wet or frozen.

21. Backfill for Pipelines

a. The sub grade shall be properly shaped before any material is placed and compacted. Care shall be taken that stones and lumps shall not become nested.

b. Place backfill material in six-inch layers to a point at least two feet above the pipe crown. Thoroughly compact each layer for the full trench width and under, around, and over the pipe, using hand-operated mechanical tampers exerting a pressure of not less than 250 foot pounds per square foot of tamping force. The contractor shall be responsible for pipe damage as a result of excessive tamping force.

c. Remainder of trench, more than two feet above pipe crown, may be backfilled by machinery in one-foot layers, thoroughly compacted.

22. Final Grading & Topsoil

a. Prior to placement of topsoil, the subgrade shall be disced or rototilled to a minimum depth of 2 inches.

b. Topsoil shall be uniformly distributed in a 4-8 inch layer and lightly compacted to a thickness of 4 inches (or as indicated on the plans) using a cultipacker, roller, or other approved equipment weighing 100-160 pounds per linear foot of roller.

c. Topsoil shall not be placed when either the topsoil or the subgrade is frozen, excessively wet, extremely dry, or in a condition otherwise detrimental to proper grading.

d. Final grading shall not permit ponding of water.

23. Tests and Testing

a. The optimum moisture content and the maximum density of each type of material used for structural fill and backfill shall be determined by "Standard Test Methods for Moisture Density Relations of Soils and Oil- Aggregate Mixtures Using 5.5-lb. Rammer and 12-inch Drop (ASTM D698) or (AASHTO T-99)".

b. The field moisture content of materials being compacted shall be determined by "Laboratory Determination of Moisture Content of Soil," (ASTM D2216). The field density of compacted material shall be determined by either "Standard Test Method for Density of Soil in Place by Sand Cone Method," (ASTM D1556) or- "Standard Test Method for Density of Soil in Place by the Rubber Balloon Method," (ASTM D2167).

c. Perform sufficient field density and field moisture content tests on each lift of material to ensure the Engineer that the requirements of this Section of the Specifications are compiled with.

d. State when and where the tests are to be made so that the Engineer may observe the testing. Submit certified reports verifying test results. The Engineer may order more testing should he feel the above procedures to give inadequate information, or if he feels the results of such testing to be questionable.

24. Maintenance of Backfilled Excavations

a. The Contractor shall maintain the backfilled area in proper condition for a period of one year after final acceptance of the project. All defects shall be promptly corrected. If the Contractor fails to do so within a reasonable time after the receipt of written notice from the Engineer, the County may correct any dangerous condition at the Contractor's expense.

b. The Contractor shall be responsible for any injury or damage that may result from improper maintenance of trenches at any time previous to the end of the aforementioned guarantee period.

25. Fill or Embankments

a. Fill or embankment above existing grade shall consist of the placing, shaping, and compaction of approved Backfill material as illustrated on the approved plans.

b. Concrete foundations, slabs, rocks, boulders, and similar material removed during excavation may be utilized in embankments when said material shall be located five feet or more below the proposed subgrade surface. When such materials are used, they shall be fractured into pieces such that no dimension exceeds 18 inches in any dimension or plane. The Contractor

shall take care to ensure that no voids develop, and shall be held responsible for any surface settlement resulting there from.

c. The embankment material shall be uniformly compacted throughout in lifts of no more than 12 inches, except in the case of rock, where lifts of up to 2 feet may be used. Except as otherwise allowed in the paragraph above, the embankment material shall conform to the requirements of Backfill. Each layer shall be compacted at optimum moisture content and the embankment shall have the required maximum density of ninety five percent (95%) as compared to the density of the same material when tested in accordance with AASHTO T99.

d. Do not place embankment upon frozen ground or areas covered with snow or ice or saturated soils.

e. The area upon which embankments are to be placed shall be denuded of vegetation per Section 02100.

f. Compact the ground upon which the embankment shall be constructed to a depth of 8 inches prior to placing any fill material.

g. Embankments to be constructed over swampy areas may be deposited by end dumping the original course. This course may exceed 8", but shall be the minimum depth required to support the equipment and shall be determined by the Engineer. The use of compaction equipment shall not be required on the original course.

PART 4 - MEASUREMENT AND PAYMENT

26. Excavation

Excavation, including backfill, shall be considered incidental to other work. Therefore, no separate payment shall be made for Excavation.

27. Fill

When explicitly **included** as a separate pay item on the Bid Form, Fill shall be measured by the cubic yard in place as illustrated on the approved plans, or as approved by the Project Officer, and shall include all materials, equipment, and labor to construct the fills or embankments as illustrated on the construction drawings. Payment shall include all clearing and grubbing, preparation, acquisition, transporting, storing, and handling of material, placement, shaping, compaction, and all other activities necessary to comply with these Specifications.

28. Select Borrow

When explicitly **included** as a separate pay item on the Bid Form , Select Borrow shall be measured in cubic yards in place. Payment shall include acquisition of materials, transport, preparation, handling,

storage, ground preparation, excavation, placement, compaction, testing, and all other activities necessary to comply with the Contract requirements.

29. Protection of Existing Utilities, Structures, and Property

Protection of existing utilities (above and below ground), structures, and other property is considered a subsidiary obligation of the Work. There shall be no compensation or other consideration for the protection, repair, replacement, or restoration of any such facilities. In the event of unknown and unidentified underground utilities or other underground structures that must be protected to complete the Work, the Contractor shall immediately notify the Project Officer. The Contractor shall identify appropriate methods to protect the unidentified facilities, and shall obtain written approval from the Project Officer prior to undertaking any action.

30. Saw Cutting

The cost for saw cutting shall be incidental to other items in the Contract; therefore, there shall be no separate payment for saw cutting.

PART 1 - GENERAL

1.1 Description of Work

Provide all labor, materials, tools and equipment as required to excavate and dispose of rock as specified herein.

1.2 Related Work Specified Elsewhere

Section 02200 - Earthwork for Structures and
Pipelines Section 02201 - Earthwork for Roadways

1.3 Applicable Specifications

Underground Utility Protection Ordinance (Chapter 55 of the Arlington County Code)

1.4 Submittals

Submit the blasting plan to the Engineer for review and acceptance. Keep and submit to the Engineer an accurate record of each blast. The record shall show the general location of the blast, the depth and number of drill holes, the kind and quantity of explosive used, and other data required for a complete record.

1.5 Definition:

Rock shall be defined as:

1. Boulders or concrete material, excluding curb and gutter and sidewalk, exceeding 1/2 cubic yard in volume.
2. Solid ledge rock conglomerate deposits and non-stratified masses so firmly cemented as to require drilling and blasting; wedging; and/or barring for its removal.

1.6 Permits and Regulations

A. Obtain all permits required for the transportation, handling, storage and use of explosives and drilling equipment. Blasting permits shall be obtained from the Arlington County Fire Marshal.

B. Observe the Underground Utility Protection Ordinance of Arlington County as well as state and federal laws and ordinances relating to explosives. Blasters shall have licenses available for examination at all times on the work site.

PART 2 - MATERIALS

Explosives shall be commercial grade. Explosives, equipment and appurtenant items are the Contractor's option.

PART 3 - EXECUTION

3.1 General

Excavate rock to the lines and grades indicated on the construction standards. Excavate to 6 inches below pipe or precast structure bottom and to the bottom of poured-in-place concrete structures.

3.2 Explosives

When the use of explosives is necessary, exercise the utmost care not to endanger life or property. Be responsible for damage resulting from the use of explosives. The Engineer shall not be responsible for the blasting plan.

3.3 Blasting

A. Notify the Engineer at least 48 hours in advance of blasting operations.

B. Conduct all operations involving explosives using experienced personnel only.

C. Blast only with such quantities and strengths of explosives and in such manner as shall break the rock approximately to the intended lines and grades.

D. Avoid excessive cracking of the rock upon or against which any structure shall be built. Prevent damage to existing pipes or other structures and property above or below ground.

E. Cover areas to be blasted with mats, logs or other material to stop flying matter during explosions. Give sufficient warning to all persons in the vicinity of the work before a charge is exploded. Employ flagmen to stop or direct traffic as required.

3.4 Excess Rock Excavation

If rock is excavated beyond the limits of excavation indicated on the standard and is not authorized in writing by the Engineer, the excess excavation, whether resulting from

over breakage or other causes, shall be defined as excess rock excavation and backfilled, by and at the expense of the Contractor, as specified below:

1. In pipe trenches, excess excavation below the elevation of the bottom of the pipe bedding, cradle or encasement shall be filled with material of the same type, placed and compacted in the same manner, as specified for the bedding, cradle, or encasement.

2. In excavations for structures, excess rock excavation beneath foundations shall be filled with Class A3 concrete. Other excess rock excavations shall be filled with structural fill as specified in Section 02200 with the approval of the Engineer.

3. In excavations for roadways, excess rock excavation shall be filled with material as specified for the sub grade.

3.5 Shattered Rock

If rock below normal depth is shattered due to drilling or blasting operations and such shattered rock is unfit for foundations, the shattered rock shall be removed and the excavation shall be backfilled as described above in excess rock excavation. All such removal and backfilling shall be classified as excess rock excavation and shall be at no additional expense to the County.

PART 4 - MEASUREMENT AND PAYMENT

4.1 The measurement for rock excavation for structures and pipelines shall be the vertical depth up to 6 inches below pipe and precast structures and to the bottom of cast-in place structures. The pay width for rock shall be as shown in the pipe trench standards for pipe and shall be the outside dimension plus 12 inches for structures. The pay width and depth shall be fixed regardless of the actual dimensions of rock excavation. Payment shall be made for the cubic yards excavated and shall include the pipe or precast structure bedding due to over excavation. Any additional testing required, including seismograph, other than that shown on approved plans shall be done at no cost to the County.

4.2 The measurement for rock excavation for roadways shall be to the bottom of the sub grade and to the lines and grades as shown on the approved plans. Payment shall be made for the cubic yards excavated.

PART 1 - GENERAL

1.1 Description of Work

Provide all labor, material, equipment and incidentals to furnish and place the riprap as called for on the approved plans and as specified herein.

1.2 Related Work Specified Elsewhere

Section 03100 - Concrete Formwork, Reinforcement and Materials Section 04100 - Mortar and Grout

1.3 Applicable Specifications

Virginia Department of Transportation, Road and Bridge Specifications (VDOT)

PART 2 - MATERIALS

2.1 General

A. Stone for riprap and bedding shall be as specified in VDOT Section 205 and shall be sound, durable and free from seams, cracks and other structural defects or imperfections tending to destroy its resistance to weathering.

B. Riprap bedding shall be reasonably well graded crush stone within the following limits:

Sieve Size	Total Percent Passing
3-inch	100
1-1/2-inch	75-95
3/4-inch	50-85
No. 4	25-55
No. 16	10-25
No. 50	2-10

C. Grade A, B, or C sand may be used in mortared or grouted riprap.

2.2 Dry Riprap

A. Dry riprap, Class I, shall meet VDOT Section 414.03(a).

B. Dry riprap, Class II, shall meet VDOT Section 414.03(a).

C. Dry riprap, Class III, shall meet VDOT Section 414.03(a).

2.3 Mortared Riprap

Stone for this purpose shall, as far as practicable, be selected as to size and shape in order to secure fairly large, flat-surfaced stone which shall produce a nearly true and even surface with a minimum of voids. Place the stone upon a slope not steeper than the natural angle of repose of the fill material. Fifty percent of the mass shall be broad flat stones, 2 cubic feet or more in volume, laid with the flat surface uppermost and parallel to the slope. Mortar mix shall conform to the requirements of Section 04100.

2.4 Grouted Riprap

Grout for grouted riprap shall consist of one part of Portland cement and three parts of sand, thoroughly mixed with water to produce grout having a thick, creamy consistency. The stones shall be of the same sizes and placed in the same manner as specified for dry riprap, Class 1.

2.5 Stone Riprap

Stone riprap for pier and abutment protection shall range in size up to derrick stone and shall be graded from coarse to fine in such a manner as to provide a minimum of voids.

2.6 Concrete Slab Riprap

The concrete slabs for riprap shall consist of Class A concrete, cast-in-place 6 inches thick, unless otherwise noted on the approved plans. The slabs shall be of two types: plain or reinforced concrete. If reinforcement is required, it shall be furnished as shown on the approved plans.

2.7 Dumped Riprap

A. Type (1) Core Riprap: Core riprap shall conform to the general requirements of this section and shall be reasonably well graded. It shall be composed of compact, angular pieces of derrick stone weighing no less than 500 pounds and no more than 4,000 pounds each, averaging 2,000 pounds, except that approximately ten percent by weight may consist of pieces weighing from 10

to 250 pounds each. Neither the width nor thickness of any piece of riprap shall be less than one-third of its length.

B. Type (2), Heavy Riprap: Heavy riprap shall conform to the general requirements of this section and shall be reasonably well graded. It shall be composed of compact, angular pieces of derrick stone weighing no less than three tons and no more than ten tons each, averaging four tons. Neither the width nor thickness on any piece of riprap shall be less than one-third of its length.

PART 3 - EXECUTION

3.1 Riprap Bedding

Riprap bedding of the thickness indicated on the plans shall be placed on the embankment to form a backing for the riprap. Where approved by the Engineer a construction fabric or matting may be substituted for backing, as shown on the approved plans. Spread riprap bedding uniformly on the prepared base, in a satisfactory manner, to the lines indicated on the approved plans or as directed. Placing of material by methods which shall tend to segregate particle sizes within the bedding base during placing of bedding shall be repaired before proceeding with the work. Compaction of the bedding material shall not be required, but it shall be finished to present a reasonably even surface free from mounds or depressions.

3.2 Dry Riprap

a. Place the stones upon a slope not steeper than the natural angle of repose of the fill material. Lay with joints as close as practicable and lay the courses from the bottom of the bank upward, the larger stones being placed in the lower courses. Fill the open joints with spall.

b. For Class 2 and Class 3 riprap, use stones having one broad flat surface when possible, and lay the flat surface on a horizontal earth bed prepared for it and so placed as to overlap the underlying course, the intent being to secure a lapped or – "shingled" surface which shall shed a maximum amount of water. Fifty percent of the mass shall be of stones having a volume of two cubic feet or more. These stones shall be placed first and roughly arranged in close contact. Then fill the spaces between the larger stones with stone of suitable size so placed as to leave the surface evenly stepped, conforming to the contour required, and capable of shedding water to the maximum degree practically attainable.

3.3 Mortared Riprap

Place these stones first and roughly arranged in close contact, the largest stones being placed near the base of the slope. Fill the spaces between larger stones with stones of

suitable size, leaving the surface reasonably smooth and tight and conforming to the contour required. In general, lay the stone with a degree of care that shall ensure for plane surfaces a maximum variation from a true plane of not more than 1-$^{1/2}$ inches in four feet. Warped and curved surfaces shall have the same general degree of accuracy as specified for plane surfaces.

As each of the larger stones is placed, surround it by fresh mortar and shove adjacent stones into contact. After the larger stones are in place, fill all the spaces or openings between them with mortar, and place the smaller stones by shoving them into position, forcing excess mortar to the surface, ensuring that each stone is carefully and firmly bedded laterally.

After the work has been completed as described, all excess mortar forced up shall be spread uniformly to completely fill the surface voids. Point all surface joints roughly with flush joints or with shallow, smooth-raked joints.

3.4 Grouted Riprap

Care is to be taken during placing to keep earth or sand from filling the spaces between the stones. After the stones are in place, completely fill the spaces between them with grout from bottom to top and sweep the surface with a stiff broom. Do not grout riprap in freezing weather.

In hot, dry weather, protect the work from the sun and keep moist for at least three days after grouting by the use of saturated burlap.

3.5 Stone Riprap for Foundations

Deposit in an approved manner at locations shown on the approved plans or where designated by the Engineer.

3.6 Concrete Slab Riprap

Except as modified herein, construction of the slabs shall conform to specification for Concrete Formwork, Reinforcement and Materials - Section 03100.

The concrete shall be of such consistency that it can be placed without the use of top forms.

Dig a trench of the dimensions shown on the approved plans at the toe of the slope and dress the slope to the lines and grades specified.

Place the riprap in blocks of dimensions as shown on the plans, alternate blocks being poured and the remaining panels filled in later. Unless otherwise shown, the blocks shall be laid in horizontal courses and successive courses shall break joints with preceding

ones. The joint details shall be as shown on the approved plans, but if not shown, the horizontal joints shall be normal to the slope and all joints shall be close joints without filler.

3.7 Dumped Riprap

A. The slopes above mean high water shall be finished to a reasonably smooth and compact surface within an allowable tolerance of two inches from the surface lines, cross-sections and elevations indicated on the plans. Tolerances for underwater portions shall be six inches. The degree of finish for graded slopes of the embankment shall be that obtainable from either blade grader or scraper operations, as the Contractor may elect. Immediately prior to placing riprap bedding in any area, the prepared base shall be inspected by the Engineer and no material shall be placed thereon until that area has been approved.

B. Place dumped riprap on the embankment as soon as practicable after the riprap bedding has been finished. Place stone for dumped riprap on the bedding material in such a manner as to produce a reasonably well graded mass of rock with a practicable percentage of voids and construct to the lines and grades shown on the approved plans, or as directed. Riprap shall be to its full course thickness in one operation and in such a manner as to avoid displacing the underlying material. Do not place dumped riprap in layers. The larger stones shall be reasonably well distributed. The finished riprap shall be free from pockets of small stones and clusters of larger stones. Hand-placing to a limited extent may be required, but only to an extent necessary to secure the results specified and as required to form reasonably uniform slopes. A tolerance of plus-six inches or minus-four inches from the lines and grades shown on the plans shall be allowed in the finished surface, but the extremes of such tolerance shall not be continuous over an area greater than 200 square feet.

C. The desired distribution of the various sizes of stones throughout the mass may be obtained, at the option of the Contractor, either by selective loading at the quarry or other source, by controlled dumping of successive loads during final placing or by a combination of these methods. Do not place riprap by dumping into chutes or other similar methods likely to cause segregation of the various sizes. The Contractor shall maintain the riprap protection until accepted and any material displaced by any cause shall be replaced at his expense to the lines and grades shown on the plans.

PART 4 - MEASUREMENT AND PAYMENT

4.1 Riprap Bedding

Riprap bedding shall be considered a subsidiary requirement for the placement of dry riprap and dumped riprap. Payment for riprap bedding shall be included in the unit price bid for dry riprap or dumped riprap.

4.2 Dry Riprap

Dry riprap shall be measured in square yards actually placed, by class, and payment shall include the riprap bedding in-place and shall be at the unit price stated in the bid proposal.

4.3 Mortared Riprap

Mortared riprap shall be measured in square yards actually placed. Payment shall be at the unit price stated in the bid proposal.

4.4 Grouted Riprap

Grouted riprap shall be measured in square yards actually placed. Payment shall be at the unit price stated in the bid proposal.

4.5 Stone Riprap

Stone riprap shall be measured in units of volume or weight. Payment shall be at the unit price stated in the bid proposal.

4.6 Concrete Slab Riprap

Concrete slab riprap shall be measured in units of square yards actually placed. Payment shall be at the unit price stated in the bid proposal.

4.7 Dumped Riprap

Dumped riprap shall be measured in tons as evidenced by railroad bills of lading or truck delivery tickets. Payment shall include the riprap bedding in place shall be at the unit price stated in the bid proposal.

4.8 Excavation

Demolition, excavation and restoration shall be considered incidental to the work for the placement of all types of riprap and therefore, no separate payment shall be made for excavation.

PART 1 - GENERAL

1.1 Description of Work

Provide all labor, material and equipment to perform all work pertaining to the fabrication, construction, and installation of gabions in accordance with these specifications and the lines, grades and dimensions shown on the approved plans.

1.2 Related Work Specified Elsewhere

Section 02200 - Earthwork for Structures and Pipelines

1.3 Applicable Specifications

Virginia Department of Transportation, Road and Bridge Specifications (VDOT)

PART 2 - MATERIALS

2.1 Gabion Units

Wire mesh used to form gabion baskets shall conform to Section 228 of the VDOT Specifications. Mesh edge wire and selvedge reinforcing wire shall be not less than 0.150 inch (9 gauge) and lacing/tie wire for binding gabion units together, not less than 0.087 inch for galvanized gabion units. When PVC coated gabions are specified on the plans, minimum edge wire and selvedge wire shall be 0.132 inch and lace wire 0.087 inch.

2.2 Stone

Stone shall conform to Section 204.02 of the VDOT Specifications.

2.3 Filter Material

Filter material shall be Miraf 140, Typar 3401 or equal.

PART 3 - EXECUTION

3.1 Excavation for gabions shall be performed in accordance with Section 02200. Gabions shall be placed on a smooth foundation. Final line and grade shall be approved by the Engineer.

3.2 The assembly, placement and filling of the gabion units shall be as specified in Section 610.02 of VDOT Specifications.

PART 4 - MEASUREMENT AND PAYMENT

Gabion structures shall be measured in cubic yards based on the nominal dimensions of the baskets (units) placed. Payment shall be at the unit price stated in the Bid Proposal and shall include: demolition, slope preparation, excavation, erosion and sediment control, filter material, backfill and restoration where required, and all other work necessary for a complete installation in place.

PART 1 - GENERAL

1.1 Description of Work

Provide all labor, material and equipment to furnish and construct pile foundations as called for on the approved plans and specified herein.

The work includes pile foundations and all other incidental construction.

1.2 Related Work Specified Elsewhere

Section 02100 - Clearing and Grubbing
Section 02110 - Demolition
Section 06100 - Structural Timber and Lumber
Section 09800 - Wood Preservatives

1.3 Applicable Specifications

A. American Association of State Highways and Transportation Officials (AASHTO)
B. American Wood Preserver's Association (AWPA)

1.4 Applicable References

A. Erosion and Sediment Control Ordinance (Chapter 57 of the Arlington County Code)
B. National Forest Products Association (NFPA)
C. Virginia Department of Transportation, Road and Bridge Specification (VDOT)

1.5 Product Handling

Piling shall be delivered, stored and handled carefully to prevent physical damage such as excessive kinks, camber or twist that would prevent proper installation.

PART 2 - MATERIALS

2.1 General

Timber piles shall conform to the applicable requirements of AASHTO M168. When the piles are to be treated, the treatment shall be as specified in Section 09800 of these specifications title: Wood Preservatives.

Timber piles which shall be below water level at all times may be of any species of wood which shall satisfactorily withstand driving.

In untreated piling for use in exposed work, the diameter of the heartwood shall be not less than 80 percent of the required diameter of the pile.

All wood piling shall be cut from sound and solid trees, preferably during the winter season. They shall contain no unsound knots. Sound knots shall be permitted, provided the diameter of the knot does not exceed four (4) inches or one-third (1/3) of the diameter of the stick at the point where it occurs. Any defect or combination of defects, which shall impair the strength of the pile more than the maximum allowable knot, shall not be permitted. The butts shall be sawed square and the tips shall be sawed square or tapered to a point not less than four (4) inches in diameter as directed by the Engineer.

Shoes for timber piles shall be of steel or cast iron and of a shape which shall allow a secure connection to the pile and shall withstand driving.

2.2 Timber Piles

Piles shall be cut above the ground swell and shall taper from butt to tip. A line drawn from the center of the tip to the center of the butt shall not fall outside of the center of the pile at any point more than one (1) percent of the length of the pile. In short bends, the distance from the center of the pile to a line stretched from the center of the pile above the bend to the center of the pile below the bend shall not exceed four (4) percent of the length of the bend or two and one-half (2-1/2) inches. All knots shall be trimmed close to the body of the pile.

Round piles shall have a minimum diameter at the tip, measured under the bark, as follows:

Length of Pile	Tip Diameter
Less than 40 feet	8 inches
40 to 60 feet	7 inches
Over 60 feet	6 inches

The minimum diameter of piles at a section four (4) feet from the butt, measured under the bark, shall be as follows:

Length of Pile	Diameter	
	So. Yellow Pine, Douglas Fir, or Species of So. Cypress	All Other
20 feet & under	11 inches	11 inches
20 to 30 feet	12 inches	12 inches
30 to 40 feet	12 inches	13 inches
Over 40 feet	13 inches	14 inches

The diameter of the piles at the butt shall not exceed twenty (20) inches. Square piles shall have the dimensions shown on the plans.

PART 3 - EXECUTION

3.1 Inspection

Timber piles shall be branded, prior to shipment, with the supplier's brand, year of treatment, species of timber and preservative treatment, retentions and class and length. The brand symbols shall conform to the American Wood Preserver's Association Standard M6.

3.2 Installation

Unless otherwise specified, all piles shall be peeled by removing all of the rough bark and at least eighty (80) percent of the inner bark. No strip of inner bark remaining on the stick shall be over three-fourths (3/4) inch wide or over eight (8) inches long, and there shall be at least one (1) inch of clean wood surface between any two (2) such strips. Not less than eighty (80) percent of the surface on any circumference shall be clean wood.

The timber pile foundations shall be installed properly in the sizes and to the alignment, batter and bearing as shown on the approved plans.

Driving heads, mandrels or other devices shall be provided so that the piling shall be driven without injury.

The piling heads shall be square and a driving cap provided to hold the axis of the pile in line with the axis of the hammer.

PART 4 - MEASUREMENT AND PAYMENT

Timber bearing piles shall be measured by the number of linear feet from points of tips to heads of the piles remaining in place on the completed project. Payment shall be at the unit price stated in the Bid Proposal and shall include splicing, pointing tips; the furnishing, fitting and attaching of metal shoes or points painting, and for furnishing all other labor, tools, equipment and incidentals necessary to complete the work.

PART 1 - GENERAL

1.1 Description of Work

Provide all labor, material, equipment and incidentals to furnish and place the cofferdams as called for on the approved plans and specified herein.

The work includes using cofferdams to allow the construction of substructures in open excavation.

1.2 Related Work Specified Elsewhere

Section 02100 - Clearing and Grubbing
Section 02200 - Earthwork for Structures and Pipelines
Section 02300 - Pile Foundations - Timbers
Section 02400 - Sheeting, Shoring and Bracing
Section 03100 - Concrete Formwork, Reinforcement and Materials

1.3 Permits and Regulations

The Contractor shall obtain all permits required by the State Water Control Board, and the United States Army Corps of Engineers.

1.4 Applicable References

A. Erosion and Sediment Control Ordinance (Chapter 57 of the Arlington County Code)

B. Virginia Department of Transportation, Road and Bridge Specifications (VDOT)

1.5 Submittals

The Contractor shall submit, upon request, drawings showing his proposed method of cofferdam construction and other details left to his option or not fully shown on the plans.

PART 2 - MATERIALS

Materials shall be at the Contractor's option with the approval of the Engineer.

PART 3 - EXECUTION

Cofferdams for foundation construction shall be as watertight as practicable and carried to a depth which shall allow them to function properly without displacement. In general, the interior dimensions of cofferdams and cribs shall be such as to give sufficient clearance for the construction of forms, the inspection of their exteriors, and to permit pumping from outside of the forms. Cofferdams which are tilted or moved laterally during the process of sinking shall be corrected so as to provide the necessary clearance.

When conditions are encountered which render it impracticable to dewater the foundation, the Contractor may be required to construct a concrete foundation seal of such dimensions as may be necessary and the balance of the masonry shall be placed in the dry. When a foundation seal is placed under water, the cofferdam, if it is to remain in place, shall be vented or ported at low water level.

Cofferdams shall be constructed so as to protect fresh concrete against damage from a sudden rising of the stream and to prevent damage to the foundation by erosion. Timber or bracing shall not be left in cofferdams in such a way as to extend into the substructure masonry, unless specifically authorized by the Engineer.

Excavation shall not be made outside of cofferdams, except as necessary to permit the constructing of same. The natural stream bed adjacent to the structure shall not be disturbed without permission of the Engineer. If any excavation or dredging is made before the cofferdams are sunk or in place, the contractor shall, without extra compensation after the foundation base is in place, backfill all such excavation to the original ground surface or stream bed with approved material. Material deposited within the stream area from foundation or other excavation or from the filling of cofferdams shall be removed and the stream area freed from all obstructions caused by the Contractor's operations. The Contractor shall exercise every reasonable precaution throughout the duration of the project to prevent erosion of the soil and the pollution and siltation of rivers, streams and impoundments.

The Contractor shall prepare and submit a plan indicating the precautions to be followed to prevent the aforementioned conditions. Such plan shall be approved prior to beginning work. The plan shall include, but is not limited to, the specific location of all temporary structures or other obstructions which shall constrict the stream flow; a description of construction activities which shall contribute to the construction of the existing stream flow; the dimensions and number of all temporary structures and constructions that are to be placed in the stream at any one time; and a dimensional elevation view of the stream and proposed temporary structures and constrictions.

The Contractor shall prevent stream constriction which would reduce stream flows below the minimum, as defined by the State Water Control Board, during construction operations.

Unless otherwise provided, cofferdams or cribs with all sheeting and bracing shall be removed after the completion of the substructure, care being taken not to disturb or otherwise injure the finished masonry.

PART 4 - MEASUREMENT AND PAYMENT

Cofferdams shall be measured in vertical linear feet. Payment shall be at the contract unit price stated on the Bid Proposal and shall include all materials, labor and equipment for clearing and grubbing, demolition, excavation, placement, backfill and restoration.

PART 1 - GENERAL

1.1 Description of Work

Provide all labor, material, equipment, and incidentals to furnish and place the sheeting, shoring or bracing for the protection of the work, and public or private property, and for the safety of personnel as called for on the approved plans, as specified herein, or as required by field conditions and/or regulations.

1.2 Related Work Specified Elsewhere

Section 02100 - Clearing and Grubbing
Section 02200 - Earthwork
Section 02300 - Pile Foundations - Timber
Section 02350 - Cofferdams
Section 03100 - Concrete Formwork, Reinforcement and Materials

1.3 Applicable Specifications

A. American Association of State Highways and Transportation Officials (AASHTO)
B. American Society for Testing and Materials (ASTM)
C. Occupational Safety and Health Act (OSHA)

1.4 Applicable References

A. Erosion and Sediment Control Ordinance (Chapter 57 of the Arlington County Code) B. Virginia Department of Transportation, Road and Bridge Specifications (VDOT)

PART 2 - MATERIALS

Materials shall be of metal, wood or other material acceptable to the Engineer. Sheet steel piling shall conform to ASTM A-328. Structural timber and timber piles shall conform to AASHTO M-168.

PART 3 - EXECUTION

3.1 General

A. Be fully responsible for the design and supervision of installation and removal of all sheeting, shoring and bracing required to support the excavation. Submit the design and proposed installation procedure to the Engineer for approval prior to any excavation. Approval by the Engineer shall not relieve the Contractor of the responsibility for the adequacy of the shoring, and if at any time during the progress of the work it is determined

by the Engineer that such design and installation is inadequate, the Contractor shall at his expense, furnish, install or make such changes in the plan or installation as may be necessary to perform the work in a manner satisfactory to the Engineer and in conformance with all applicable Local, State, and Federal regulations.

B. The sheeting, shoring or bracing installation shall provide for the depth and width of the excavation and the characteristics and water content of the soil. Also, weather conditions, the proximity of other structures, the vibration from construction equipment and/or vehicular traffic and spoil placement or other surcharge loads shall all be taken into account.

3.2 Installation

A. Furnish, put in place, and maintain such sheeting, bracing and shoring required to support the sides of the excavation and to prevent any movement of earth which could in any way injure persons, endanger adjacent structures and utilities, or delay the work.

B. Whenever possible, drive sheeting ahead of the excavation to avoid loss of material from behind the sheeting. If it is necessary to excavate below the sheeting, care shall be taken to avoid trimming behind the face along which the sheeting shall be driven. Prevent voids outside of the sheeting. If voids are formed, fill immediately with appropriate material and compact.

C. In areas not shown on the approved plans, where it is required to leave sheeting, shoring and bracing in place to prevent injury to proximate structures, utilities and property, or the installation, the approval of the Engineer, in writing, shall be required for payment. Cut off sheeting and bracing at the elevations specified by the Engineer.

3.3 Removal

Remove sheeting, shoring and bracing during the backfill operations. Provide additional backfill compaction around the area of the pipe or structure to fill voids left behind the sheeting and shoring as it is removed. Avoid the production of loads which shall increase the safe backfill load on the pipe or structure.

PART 4 - MEASUREMENT AND PAYMENT

4.1 Sheeting, Shoring and Bracing

A. Timber sheet piling, shoring and bracing, left in place as shown on the approved plans, or approved by the Project Officer, in writing, shall be measured in 1,000-feet-board measure (MFBM) for the materials actually left in place. Payment shall be at the unit price stated in the Bid Proposal and shall include all materials, labor, tools, equipment and all other work necessary for the installation.

B. Steel sheet piling, left in place as shown on the approved plans or approved by the Engineer, in writing, shall be measured in square feet (SF) for the materials actually left in place. Payment shall be at the unit price stated in the Bid Proposal and shall include all materials, labor, tools, equipment and all other work necessary for the installation.

C. Sheeting, shoring and bracing removed from the installation shall be considered a subsidiary obligation of the work to which it pertains. Payment for such sheeting, shoring and bracing shall be included in the unit and lump sum prices of the work to which it pertains.

D. Demolition, excavation and restoration, as may be required by the Contract work, are considered incidental and therefore no separate payment shall be made for demolition, excavation or restoration.

PART 1 - GENERAL

1.1 Description of Work

Provide all labor, materials, and equipment to furnish and install gravity sewer pipe, structures, and appurtenances as specified herein and in related specifications.

1.2 Related Work Specified Elsewhere

Section 02200 - Earthwork
Section 02505 – Storm Sewers
Section 02510 - Sanitary Sewers
Section 02515 – Televised Inspection of Sewers
Section 02650 – Restoration of Roadways
Section 02950 - Tunneling
Section 02951 - Boring and Jacking
Section 03400 - Precast Concrete
Section 04200 - Masonry Units
Section 05500 – Structural Steel

1.3 Applicable Specifications

A. American Society for Testing and Materials (ASTM)

B. American National Standards Institute (ANSI)

C. Virginia Department of Transportation, Road and Bridge Specifications (VDOT)

1.4 Applicable Reference

1. Arlington County Plumbing Code (Chapter 18 of the Arlington County Code)

2. Arlington County Utilities Code (Chapter 26 of the Arlington County Code)

3. Erosion and Sediment Control Ordinance (Chapter 57 of the Arlington County Code)

4. Virginia Department of Conservation and Recreation Erosion and Sediment Control Handbook

5. Virginia Department of Health (VDH) and State Water Control Board Sewerage Regulations (VR 355-17-000) [Section 62.1-44.19(8) of the Virginia Code].

1.5 Submittals

Submit full descriptions and details of all pipe, valves, hydrants, and other appurtenances proposed for the project Per Section 01300 Submittals.

1.6 Quality Assurance

1. The Contractor shall be responsible for providing evidence that all materials used in the work meet all applicable standards and certifications. Such evidence shall comply with the requirements of Section 01300.

2. The Contractor shall provide ample space and other accommodations to enable the Engineer to inspect all pipe, structures, and other materials upon delivery to the site and prior to utilizing the pipe, structures and materials in the Work. The Contractor shall ensure that materials are stockpiled or otherwise stored such that the Engineer has access to all aspects and components.

3. The Contractor shall conduct a television inspection of all installed sewer installations in accordance with Section 02515 (CCTV Sewer Inspections) prior to final acceptance.

1.7 Easements

1. Sewers shall be installed within the ROW whenever possible.

2. Where the following clearances cannot be maintained within the ROW, permanent easements shall be secured to allow for maintenance and operations.

    a. 10 feet each side of the centerline (20 feet total) for sewers 15 inches and smaller and less than 10 feet in depth.

    b. 10 feet from the outside edge of the pipe for sewers greater than 15 inches or deeper than 10 feet in depth.

PART 2 - MATERIALS

Reinforced Concrete Pipe (RCP)

1. RCP shall conform to ASTM C-76, Class III or greater. Asbestos containing pipe or appurtenances shall not be accepted.

2. RCP pipe shall be in lengths of at least 8 feet and shall be manufactured with bell and spigot ends with rubber gasket joints conforming to ASTM C443.

Polyvinyl Chloride Pipe

1. PVC pipe and fittings 15” and less shall comply with ASTM D3034.

2. PVC pipe and fittings larger than 15” shall comply with ASTM F679, T-1.

3. PVC pipe shall be in lengths of at least 12 feet, and be manufactured with integrated bell gasket joints. Joints shall comply with ASTM D3212 and gaskets shall comply with ASTM F477.

4. PVC pipe shall be less than 6 months old at the time of installation.

Polypropylene Pipe (PPP)

1. PPP shall conform to ASTM F2881 and AASHTO M330

2. Joint performance shall meet or exceed ASTM D3212

Precast Concrete Manholes

1. Precast manhole bases, risers, and cones shall conform to the requirements of ASTM C-478. Cones shall be eccentric. Manholes shall have a minimum internal diameter of 48 inches.

2. All sections shall be of male and female end type with a preformed groove provided in the male end for a round rubber gasket ring complying with ASTM C361 or C443. The gasket assembly alone shall provide adequate sealing to meet internal and/or external pressure requirements.

3. Precast manhole sections shall be clearly marked with the following information as applicable: ASTM designation, standard detail or drawing number, station location and designation, date of manufacture and name of manufacturer.

4. Precast manholes shall be manufactured by Americast, or approved equal.

Concrete

Concrete used in manhole or structure construction shall be type A3 and conform to the requirements of Section 03100 – Concrete Formwork, Reinforcement, and Materials.

Brick

Brick used in manhole bench and collar construction shall conform to the requirements of Section 04200 - Masonry Units.

Mortar

Mortar used in manhole construction shall be one part of Portland cement conforming to ASTM C150, Type II, and two parts of sand conforming to ASTM C144, with enough water added to produce mortar of the proper consistency for the type of joint.

Manhole Frames and Covers

1. Manhole frames and covers shall be constructed of gray or ductile iron conforming to ASTM A48 and A536.

2. Frames and covers shall have machined bearing surfaces to prevent rocking and rattling under traffic.

3. Manhole covers shall be as shown on the Construction Standards and as indicated on the Contract Drawings. Frames and covers shall be manufactured by Dewey Brothers Inc., or equal.

Manhole Steps

1. Manhole steps shall be a composite of a No. 3 grade 60 deformed steel bar encased in a copolymer polypropylene plastic of the "press-fit" design or rubber.

2. Steps shall be PSI-PF as manufactured by M.A. Industries or Wedge-Lok as manufactured by Delta Pipe Products, or approved equal.

Manhole Neck Adjustments

1. Adjustments to manhole necks shall be limited to 2 inches of concrete.

2. Concrete adjustment rings shall be used for adjustments in excess of 2 inches, but not to exceed 12 inches. Non-shrink grout shall be used between adjustment rings.

Quick-Setting Grout

Quick-setting non-shrink grout shall conform to the requirements of VDOT. Use Octocrete, Speedcrete, or approved equal.

Miscellaneous Metals

Structural steel, grating and miscellaneous metal shall conform to the requirements of Section 05500 - Structural Steel and Miscellaneous Metal.

PART 3 - EXECUTION

1. General

1. No sewer facilities shall be constructed without approved plans, shop drawings, and construction cut sheets.

2. Sewer size, material, direction, and grade shall remain constant between manholes or structures.

3. Bring any conflicts during the installation of piping to the attention of the Engineer.

4. If any active sewers must be removed from service for any period of time, the Contractor shall submit for approval per Section 01300 a plan for diverting flow or otherwise maintaining service and capacity of the existing pipe(s) while out of service.

5. In the event of a water or sewer emergency, the Contractor shall immediately notify the County's Water Control Center at 703-228-5555 and the Project Officer.

2. Laying Pipe

A. PVC sewer shall not be installed with less than 3 feet of cover from the top of pipe to finished grade.

B. PVC pipe installed with less than 14' feet of cover shall be SDR 35 (pipe stiffness of 46 psi) or stronger. PVC installed with 14 or more feet of cover shall be SDR 26 (pipe stiffness of 115 psi) or stronger. PVC shall not be installed at depths greater than 20' without special design analysis.

C. RCP sewer shall not be installed with less than 18 inches of cover from the top of the pipe to finished grade. Refer to the table below for minimum Class requirements based upon height of cover from the top of the pipe to finished grade and pipe diameter:

	12"	15"	18"	24"	30"	36"	42"	48"	60"	72"	84"
2'	IV	III	III	III	III	III	III	III	III	III	III
3'	III	III	III	III	III	III	III	III	III	III	III
4'	III	III	III	III	III	III	III	III	III	III	III
5'	III	III	III	III	III	III	III	III	III	III	III
6'	III	III	III	III	III	III	III	III	III	III	III
7'	III	III	III	III	III	III	III	III	III	III	III
8'	IV	III	III	III	III	III	III	III	III	III	III
9'	IV	IV	III	III	III	III	III	III	III	III	III
10'	IV	IV	IV	III	III	III	III	III	III	III	III
11'	IV	IV	IV	III	III	III	III	III	III	III	III
12'	IV	IV	IV	IV	III	III	III	III	III	III	III
13'	IV	IV	IV	IV	IV	III	III	III	III	III	III
14'	IV	IV	IV	IV	IV	IV	IV	IV	IV	IV	IV
15'	IV	IV	IV	IV	IV	IV	IV	IV	IV	IV	IV
16'	IV	IV	IV	IV	IV	IV	IV	IV	IV	IV	IV
17'	V	IV	IV	IV	IV	IV	IV	IV	IV	IV	IV
18'	V	IV	IV	IV	IV	IV	IV	IV	IV	IV	IV
19'	V	IV	IV	IV	IV	IV	IV	IV	IV	IV	IV
20'	V	IV	IV	IV	IV	IV	IV	IV	IV	IV	IV

D. PPP sewer shall not be installed with less than 2 feet of cover from the top of the pipe to finished grade

E. PPP shall not be installed at depths greater than 20' without special design analysis

3. Laying Pipe

A. Install PVC pipe in accordance with ASTM D2321. Install RCP pipe in accordance with ASTM C1479.

B. Use the proper tools for the safe handling and laying of pipe. Unload pipe by hand, skidways or hoists in such a manner so that material is not dropped or damaged. Distribute pipe at site of installation near area where it is to be laid. Protect machined ends of pipe from damage and keep pipe free from dirt and debris.

C. Lay pipe to a true uniform line and grade from elevations indicated on the drawings with continuous bearing of barrel and bells on cradle or bedding material. Excavate bedding material at bells to ensure continuous and direct bearing of all portions of the pipe and bell on bedding materials.

D. Utilize adequate bedding material to provide a continuous and firm bearing profile for the pipe. Pay particular attention to sufficient compaction of the bedding and haunches area below the pipe springline.

E. Lay pipe upgrade whenever possible and with the bell end pointing in the direction of work progress.

F. Use full manufactured lengths of pipe whenever possible. Do not use short lengths of pipe with couplings unless approved by the Engineer.

G. Plug or grout lift holes left in the pipe prior to backfilling operations.

H. As the work progresses, clear the interior of the pipe of all dirt and superfluous materials of every description.

I. Keep trenches and excavations free of water during construction and until final inspection. Do not lay pipe in water or in a frozen bedding condition. Prevent flotation and re-lay pipe that has floated.

J. Install PPP in accordance with ASTM D2321

4. Manholes, Catch Basins, and Other Structures

A. All structures shall be constructed to be watertight under the anticipated loads and site conditions.

B. Structures shall be centered along the axis of the pipes intersecting the structure, unless otherwise specified. Structures shall not be placed overtop of any other utilities.

C. Cast-in-place concrete for structures shall be placed monolithically, or as shown on the plans. Concrete may be allowed to drop freely up to five feet in height; where greater drops are required, a tremie or other device approved by the engineer shall be used.

D. Construct flow channels in the bottom of structures. Cast in place channels shall be a minimum of 4 inches thick 3000 psi concrete. Provide a positive means of bonding the channel to the manhole base of the structure. Flow channels shall provide a smooth transition from inlet pipe(s) to outlet pipe(s) to minimize turbulence. Benches shall be sloped towards the channel to prevent the accumulation of debris.

E. Steps shall be provided in any structure greater than 4' in depth. Steps shall be installed in accordance with Standard Drawing M-2.0.

F. The crown of inlet pipes shall not be lower than the crown of outlet pipes.

G. Cut all pipes flush with the inside walls of the structures. Sanitary structures shall use a flexible rubber gasket designed specifically for the materials and the anticipated service conditions to ensure a watertight and flexible joint.

H. Adjust frame and cover to match finished grade using concrete adjusting ring(s).

5. Abandonment of Sewers

A. Sewers to be abandoned may be excavated and removed or abandoned in place as detailed below.

B. Structures to be abandoned in place shall be excavated and removed to a minimum depth of 2' below finished grade. The remainder of the structure shall be filled with flowable fill, 21A aggregate, or sand. #57 aggregate may be used if all openings of the structure are completely covered with filter fabric to prevent migration of adjacent fines.

C. Sewers to be abandoned in place shall be capped at all open ends and completely filled with flowable fill.

6. As Built Plans

A. Prior to Final Release & Payment, the Contractor shall submit one set of As-Built drawings per Section 01300 and meeting industry standards for clarity, detail, and precision. As Builts shall include a certification from the Contractor that the plans as drawn indicate actual construction.

B. The As-Builts shall include, at a minimum:
   a. Invert Elevations
   b. Manhole top elevations
   c. Percent of grade between manholes
   d. Horizontal distance between manholes

e. Any material changes
f. Location of connection to existing system measured from nearest structure
g. Location of pipe connections, including service lines, measured from nearest manhole
h. Actual location, depth or elevation, and type and size of all utility crossing.

PART 4 - MEASUREMENT AND PAYMENT

4.1 Sewer

Sewer pipe for the various materials, classes, and sizes shown on the plans shall be measured in linear feet along the center line of the pipe and shall be measured from inside wall of structure to inside wall of structures. Payment shall include the furnishing of all pipe and fittings, all necessary tests, excavation, removal and disposal of existing pipes, removal and disposal of unsuitable or surplus material, placement of bedding and backfill as shown in Standard M-3.0, restoration of roadways as shown in Standard M-6.1, all other restoration, and all other work required to providing a complete sewer installation in compliance with the Construction Documents.

4.2 Manholes

Manholes for the various internal diameters shall be measured by each up to 8 vertical feet from the top of the manhole cover thereafter the measurement shall be in vertical feet to the invert of the outlet pipe. Payment shall include demolition, excavation, backfill, bedding, foundation, base and components, channels, sleeves, frame and cover, intermediate landings, steps, all restoration and all other work necessary for a complete installation incompliance with the Construction Documents.

4.3 Adjust Existing Manholes to New Grade

Adjusting existing manhole tops to meet new grades, for the various types of adjustments listed in the Standard details, shall be measured as each. Payment shall include all materials, labor, equipment and any other work necessary for complete adjustment.

4.4 Excavation Below Grade and Additional Bedding

Excavation, additional bedding and associated work shall be considered Over Excavation and shall be measured and paid in accordance with Section 02200. No payment shall be made for Over Excavation without the issuance of written approval by the Project Officer prior to the work being performed.

4.5 PVC Pipe and Perforated PVC Pipe

PVC pipe and Perforated PVC Pipe for the various materials, classes, and sizes shown on the plans shall be measured in linear feet along the center line of the pipe and shall be measured

from inside wall of structure to inside wall of structures. Payment shall include the furnishing of all pipe and fittings, valve box with cap, all necessary tests, excavation, removal and disposal of existing pipes, removal and disposal of unsuitable or surplus material, placement of bedding and backfill as shown in Standard M-3.0, restoration of roadways as shown in Standard M-6.1, all other restoration , core drilling, #57 gravel, filter fabric, top soil, sod, and all work required to provide complete installation in accordance with the Contract Documents.

4.6 PVC Cleanout

PVC Cleanout for the various materials, classes, and sizes shown on the plans shall be measured as each. Payment shall include the furnishing of all pipe and fittings, valve box with cap, all necessary tests, excavation, removal and disposal of existing pipes, removal and disposal of unsuitable or surplus material, placement of bedding and backfill as shown in Standard M-3.0, restoration, #57 gravel, filter fabric, and all work required to provide a complete PVC Cleanout installation in compliance with the Contract Documents.

4.7 Sump Pump Core and Cleanout Connection

Sump Pump Core and Cleanout Connection for the various materials, classes, and sizes shown on the plans shall be measured as each. Payment shall include the furnishing of all pipe and fittings, valve box with cap, all necessary tests, excavation, removal and disposal of existing pipes, removal and disposal of unsuitable or surplus material, placement of bedding and backfill as shown in Standard M-3.0, restoration of roadways as shown in Standard M-6.1, all other restoration, radial core drilling, #57 gravel, filter fabric, top soil, sod, proposed connections to storm structures and storm pipes, and all other work required to provide a complete Sump Pump Core and Cleanout Connection installation in compliance with the Contract Documents.

PART 1 - GENERAL

1.1 Description of Work

Provide all plant, labor, supervision, materials and equipment to furnish and lay all storm sewer pipe and appurtenances to the lines and depths called for on the approved plans and as specified in Section 02500 Gravity Sewers and Appurtenances.

1.2 Related Work Specified Elsewhere

Section 02200 - Earthwork
Section 02500 – Gravity Sewers and Appurtenances
Section 02510 - Sanitary Sewers
Section 02515 – Televised Inspection of Sewers
Section 02650 – Restoration of Roadways
Section 02950 - Tunneling
Section 02951 - Boring and Jacking
Section 03400 - Precast Concrete
Section 04200 - Masonry Units
Section 05500 – Structural Steel

1.3 Applicable Specifications

A. American Society for Testing and Materials (ASTM)

B. American National Standards Institute (ANSI)

C. Virginia Department of Transportation, Road and Bridge Specifications (VDOT)

1.4 Applicable Reference

1. Arlington County Plumbing Code (Chapter 18 of the Arlington County Code)

2. Erosion and Sediment Control Ordinance (Chapter 57 of the Arlington County Code)

3. Virginia Department of Conservation and Recreation Erosion and Sediment Control
Handbook

PART 2 - MATERIALS

2.1 Precast Concrete Blocks

Precast concrete blocks shall conform to ASTM C-139.

PART 3 - EXECUTION

3.1 General

A. Storm sewers shall be RCP as specified in Section 02500 Gravity Sewers. Other materials may be approved on a case by case basis.

B. Maintain a minimum 5-feet horizontal distance between storm sewer and all other utilities.

C. The minimum vertical clearance between storm sewer and other utilities shall be 1.0 foot, unless provisions to prevent damage to the underlying utility are detailed for approval by DPW.

3.2 Catch Basins and Structures

A. Joints for masonry structures shall be completely filled and shall be smooth and free of surplus mortar on the inside of the structure.

B. Structures shall be parged on the inside using portland cement mortar 1/2” thick.

C. Concrete blocks shall be 12” in length. For structures less than 6’ in depth, 6” thick concrete blocks may be used. For depths from 6’ to 12’, 8” thick blocks shall be used. For depths greater than 12’, 12” thick blocks shall be used.

D. When possible on storm drainage inlets, manhole covers shall be positioned over the outgoing pipe.

E. Whenever grate inlets are used, they shall be bicycle friendly and placed such that the inlet openings run perpendicular to any anticipated traffic flow.

F. Shape inverts per drawing D-2.1.

G. Angle iron and frame and cover shall be painted with black asphaltic paint.

H. A construction joint shall be provided in the gutter at the outside edges of each catch basin. The gutter between the outside edges of a catch basin shall be considered part of the catch basin and this work shall be included in the payment for catch basins.

3.3 Design Requirements

Storm sewers shall be designed as described in the VDOT Drainage manual, with the exceptions defined below:

A. The 10-year storm shall be the basis of design except for conditions in which severe threat to property or life would result from system failure, in which case the 100year storm should be the design basis.

B. Storm sewer inlets on residential streets shall be located to prevent stormwater from overtopping the curb during the design storm. The design shall account for a 1" freeboard between the top of curb and gutter flow depth. Gutter flow spread shall not be permitted to overtop the crown of the roadway. On streets other than residential, storm sewer inlets shall be placed in accordance with the requirements of the VDOT Drainage Manual.

3.4 Valley Gutters

A. Concrete valley gutters may be utilized where placement of drainage inlets would not be feasible due to lack of drainage infrastructure and/or conflicts with other infrastructure.

B. Valley gutters should be used only on residential streets. For streets with greater than 1500 vehicles per day, valley gutters shall only cross stop controlled legs of an intersection.

C. Valley gutters shall be constructed of Class A3 concrete, 9" thick, placed on a 6" base of crushed aggregate, with welded wire fabric as shown in VDOT Road and Bridge Standard PR-2, and per detail R-2.9.

D. Valley gutters shall be capable of carrying the design storm runoff entirely within the concrete conveyance area.

3.5 Private Connections

A. Storm Sewer Connections are privately owned and maintained from the storm sewer main up to and including the property served. Pipe and fitting for storm sewer service connections shall conform to the requirements of the Arlington County Plumbing Code and Plumbing Code adopted by the State of Virginia.

B. Connections directly to pipes shall not be allowed without specific approval by the DES Engineering Bureau and issuance of appropriate permits. Where specifically permitted by DES, connections to existing pipes shall be made using saddles or

fittings designed specifically for use on the pipe material which it is proposed to be used upon. Concrete saddles shall not be permitted.

C. For connections to pipes 24" and smaller, the saddle shall be a strap-style saddle, with straps extending around the entire circumference of the pipe. Connections to pipes larger than 24" shall use saddles or fittings specifically designed and manufactured for such connection, with appropriate anchors. When anchors are set into concrete pipes, expansion anchors shall not be permitted. Such fittings or saddles shall eliminate any encroachment of the pump discharge pipe into the flow line of the existing pipe when flowing full. Saddles shall provide flexural relief for the pump discharge line without transmitting any stress onto the storm sewer pipe.

D. No mechanical discharge of groundwater, stormwater, or other collected water onto the public right of way shall be permitted. Gravity drainage from roofs or area drains through the curb shall be permitted.

E. Connections to existing storm sewer mains shall be at manholes or inlets. The connection shall be made by core-drilling the structure and using a manhole adaptor appropriate for the pipe and structure materials. Connections at brick or masonry structures shall be made by carefully chiseling or removing single bricks or blocks such that the clearance between the connection pipe and any portion of the manhole is minimized.

PART 4 - MEASUREMENT AND PAYMENT

Payment shall be as described in Section 02500 Gravity Sewers, except the items listed below.

4.1 Catch Basins and Yard Inlets

Catch basins, and yard inlets, shall be measured as each. Payment shall include demolition, excavation, bedding, backfill, concrete base and invert, walls, top, frame and cover, gutter or apron, steps, restoration, and all other work necessary for a complete installation.

4.2 Catch Basins or Other Structures Converted to Manholes

Catch basins, or other structures converted to manholes shall be measured as each. Payment shall include demolition, excavation, backfill, modification work necessary to convert the structure, steps if required by Standards, restoration, and all other work necessary for a complete installation.

PART 1 - GENERAL

1.1 Description of Work

Provide all plant, labor, supervision, materials and equipment to furnish and lay all sanitary sewer pipe and appurtenances to the lines and depths called for on the approved plans and as specified in Section 02500 Gravity Sewers and Appurtenances.

1.2 Related Work Specified Elsewhere

Section 02200 - Earthwork
Section 02500 – Gravity Sewers and Appurtenances
Section 02505 – Storm Sewers
Section 02515 – Televised Inspection of Sewers
Section 02650 – Restoration of Roadways
Section 02950 - Tunneling
Section 02951 - Boring and Jacking
Section 03400 - Precast Concrete
Section 04200 - Masonry Units
Section 05500 – Structural Steel

1.3 Applicable Specifications

A. American National Standards Institute (ANSI)

B. American Society for Testing and Materials (ASTM)

C. American Water Works Association (AWWA)

1.4 Applicable Reference

A. Arlington County Plumbing Code (Chapter 18 of the Arlington County Code)

B. Arlington County Utilities Code (Chapter 26 of the Arlington County Code)

C. Plumbing Code adopted by the State of Virginia

D. Erosion and Sediment Control Ordinance (Chapter 57 of the Arlington County Code)

E. Virginia Department of Conservation and Recreation Erosion & Sediment Control Handbook

F. Virginia Department of Health (VDH) and State Water Control Board Sewerage Regulations (VR 355-17-000) [Section 62.1-44.19(8) of the Virginia Code].

1.5 Submittals

Submit full descriptions and details of all materials, and appurtenances proposed for the project Per Section 01300 Submittals

1.6 Quality Assurance

A. Sanitary Sewer Field Tests
Conduct field tests as specified in paragraph 3.6.

B. Force Main Field Tests
Hydrostatic testing of force mains shall conform to the hydrostatic testing specifications of Section 02550, except that the entire force main may be pressure tested at one time.

1.7 Definitions

A. Terminal Sewer – Any sewer which has no other common sewers discharging into it.

PART 2 - MATERIALS

2.1 Polyvinyl Chloride pipe (PVC)

PVC pipe shall be as specified in Section 02500 Gravity Sewers and Appurtenances.

2.2 Concrete Pipe

Concrete pipe smaller than 12-inch shall not be used as sanitary sewer pipe. Concrete pipe shall be as specified in Section 02500 Gravity Sewers and Appurtenances.

2.3 Ductile Iron Pipe (DIP)

Ductile iron pipe shall conform to AWWA C-151 (ANSI A21.51), minimum class 52. Pipe lining shall be corrosion resistant to sewer gas, sewpercoat, protecto 401 or approved equal and shall have mechanical or push-on joints utilizing rubber gasket rings conforming to AWWA C-111 (ANSI A21.11). Fittings shall be ductile-iron, mechanical joint conforming to AWWA C-110 (ANSI A21.10) with double cement lining. Force mains shall be minimum class 52 ductile iron pipe.

2.4 Vitrified Clay Pipe

Vitrified clay pipe shall not be used as sanitary sewer pipe.

2.5 Asbestos-Cement Pipe

Asbestos-cement pipe shall not be used as sanitary sewer pipe.

2.6 Manhole Covers

Manhole covers shall be watertight, and as specified in Section 02500 Gravity Sewers and Appurtenances

PART 3 - EXECUTION

3.1 Design Basis

A. Per Capita Flow

New sanitary sewer systems shall be designed on the basis of an average daily per capita flow as follows:

Establishment	Average Daily Usage
Single Family	225 gallons per day (gpd)/unit
Multi-Family	205 gpd/unit
Apartment	160 gpd/unit
Hotel	80 gpd/room
Manufacturing	0.03 gpd/sq. ft. GFA
Transportation	0.03 gpd/sq. ft. GFA
Trade	0.11 gpd/sq. ft. GFA
Office	0.05 gpd/sq. ft. GFA
Restaurant	0.40 gpd/sq. ft. GFA
Service	0.09gpd/sq. ft. GFA
Intensive Service	0.50 gpd/sq. ft. GFA
Other	0.07 gpd/sq. ft. GFA
School	0.03 gpd/sq. ft. GFA
Church	1000 gpd/church

Note: GFA = Gross Floor Area

B. Peak Flow

1 Sanitary Sewers shall be designed to accommodate Peak Flow as determined by multiplying a Peak Flow Factor by the calculated Average Daily Usage.

2 For Terminal Sewers, or any sewers which collect only Terminal Sewers, the Peak Flow Factor shall be 4.0

3 For all other sewers, the Peak Flow Factor shall be 3.0

4 Force Mains shall be designed to accommodate a Peak Flow Factor of ___

3.2 Sanitary Sewer Design Criteria

Sanitary sewers shall be designed and installed in accordance with Arlington County Standard Details and Specifications, the Virginia Department of Health and State Water Control Board Sewerage Regulations, Water Pollution Federation Standards, the Uniform Statewide Building Code of Virginia, and the following design criteria:

A. All data regarding size of building, type of occupancy, number of occupants and estimated peak water demands as applicable for all buildings within the proposed development shall be furnished to DES to substantiate sanitary sewer main sizes. The final size of all sanitary sewer mains and appurtenances shall be determined by DES.

B. Sanitary sewer mains shall be a minimum 8-inches in diameter and shall be installed in straight alignment and grade between manholes. Minimum sewer slopes should be 0.5%. Minimum slopes for terminal sewer segments and sewers serving less than 10 households or their equivalent should be 1.0%. Slopes less than those mentioned above shall only be considered for approval by DES in extreme cases with justification provided by the Engineer. Absolute minimum allowable slopes for various sized pipes shall conform to Virginia Department of Health Sewerage Regulation VR 355-17-106.05(c) for non-settled sewage. Maximum sewer slopes shall be 15%. Slopes shall be determined between centers of manholes.

C. Sanitary sewers shall be installed at depths sufficient to serve existing and proposed basements. Minimum cover over sewers shall be 6 feet in streets and areas subject to vehicular traffic and shall be 4 feet in other areas.

D. Stream and estuary crossings shall have a 3 foot minimum cover if possible and sewer pipe shall be ductile iron encased in concrete from manhole to manhole. The pipe and joints shall be tested in place and shall exhibit zero infiltration. Sewers located adjacent to streams shall be located outside of the stream bed whenever possible and should be sufficiently removed there from to provide for possible future channel widening.

E. Gravity sewer size shall remain constant between manholes. Where a smaller sewer enters a larger one, the relative elevations of the inverts of the sewers shall be arranged to maintain approximately the same energy gradient.

F. When pipe velocities greater than 15 feet per second are expected, special provisions shall be made to protect pipes and structures against internal erosion due to high velocity and corrosive gases. The pipe shall conform to applicable ASTM, AWWA, ANSI, or other appropriate standards or specifications which provide protection against internal erosion.

G. Sanitary sewers shall be installed within street right of way and shall follow the street centerline wherever possible. The sewer shall extend a minimum of 10 feet along the property frontage of the last house being served. Sewers shall not be located longitudinally under walks. Sewers may be installed within recorded easements as specified in Section 02500 Gravity Sewers and Appurtenances when locations in public right of way are not possible.

H. The minimum clear horizontal separation between sanitary sewer mains or sewer manholes and water mains shall be 10 feet. When local conditions prevent a minimum separation of 10 feet, a closer separation may be allowed provided that:

1. The top (crown) of the sanitary sewer main shall be a minimum of 18 inches below the bottom (invert) of the water main. The sewer main and water main shall be kept in separate trenches. Where minimum vertical separation cannot be obtained, the sanitary sewer shall be constructed of ductile iron pipe and pressure tested in place without leakage prior to backfilling.

I. Sewer mains crossing under water mains shall be laid to provide a minimum vertical separation of 18 inches between the top of the sewer and bottom of the water main. If local conditions prevent this, the water main shall be relocated to provide the separation directed by the Engineer, or the sewer shall be constructed of ductile iron pipe, pressure tested in place without leakage before backfill, and with no joint of the sewer closer than 8 feet of the water main.

J. Sanitary sewer mains crossing over water mains shall maintain a minimum vertical separation of 18 inches between the top of the water main and the bottom of the sewer. The sanitary sewer shall be constructed of ductile iron pipe, pressure tested in place without leakage before backfill. Provide adequate structural support for the sewer to prevent joint deflection or settlement on or breakage of the water main (refer to Standard Drawing M-7.0).

K. The minimum clear horizontal separation between sanitary sewer and utilities other than water main shall be 5 feet.

L. The minimum vertical clearance between sanitary sewer and utilities other than water main shall be 1.0 foot, unless provisions to prevent damage to the underlying utility are detailed for approval by DES.

M. Individual building or house sewer services 5 inches and smaller shall be connected to the sanitary sewer main in accordance with the Arlington County Plumbing Code. Sanitary sewer services 6 inches and larger and sewer services serving more than one building, townhouse or similar structure shall be connected to a manhole on the sanitary sewer main as directed by DES. Existing manholes receiving new sewer services must be approved by DES and shall be reconstructed or replaced as directed by DES to meet current Standards. No sanitary sewer service taps shall be made in trunk sewers 15 inches and larger without special approval from DES.

N. Ventilation of gravity sewer systems shall be provided where continuous watertight sections (including manholes with watertight covers) greater than 1,000 feet in length are incurred [conforms to Virginia Department of Health Sewerage Regulation VR 355-17106.07(G)].

O. Sanitary sewer lines constructed in fill areas shall be continuous ductile iron (CL50) run from manhole to manhole. Fill material beneath the pipe shall be select material compacted to 95 percent density at optimum moisture (ASTM Proctor Test). Refer to 3.4C for manholes in fill areas.

3.5 Sewer Service Connections

Sewer service connections to the sanitary sewer main shall be made only by a licensed plumber and in accordance with the Plumbing Code adopted by the State of Virginia and the Arlington County Plumbing Code. No sewer service connections shall be made within 2 feet of any joint in the sanitary main or within 5 feet along the pipe leading from a terminal manhole. The minimum allowable distance between sewer service connections at the sewer main shall be 3 feet. No house service lateral shall be connected to an existing manhole without the special approval of DES.

3.6 Sanitary Sewer Acceptance Tests

A. General: Acceptance tests shall not be made until all sanitary sewer pipes, manholes and required building spurs have been installed, and the pipe trenches are backfilled to the finished grade and compacted. Prior to backfilling sanitary sewer sections, the Contractor may perform preliminary tests at his own discretion without the presence of the Engineer. The Contractor shall schedule the final acceptance tests with the Engineer at least 48 hours in advance. Final acceptance tests shall be performed in the presence of the Engineer or his duly authorized representative. All material, equipment and labor required shall be provided by the Contractor. Sewer pipes shall be tested from manhole to manhole or from manhole to terminus. Sections passing the acceptance tests shall continue to be maintained by the Contractor until a satisfactory final inspection of the entire sewer system is completed.

B. Low Pressure Air Tests: Sanitary sewer sections of one diameter only and above the ground water table shall be tested using low air pressures after completion of backfill and before hookup of house connections. Temporarily cap and securely brace all laterals for the test. Inspect sewers and manholes prior to testing and remove all soil and debris by thoroughly flushing the lines. Dispose of soil and debris without using the existing sewer system. Provide and securely brace test plugs at each manhole. After all personnel are removed from manholes, add air slowly to the portion of the pipe being tested until internal air pressure is held at a test pressure of 4.0 pounds per square inch (psi) for a minimum of two minutes. Pressure gauges used in the air test procedure shall be calibrated in divisions of 0.10 psi.

If, in the Engineer's opinion, there is any indication of leakage at the test plug, relieve the internal pressure before taking steps to eliminate the leak. After the two-minute holding period at 4.0 psi, disconnect hose and compressor from the pipe section being tested. If pressure decreases to 3.5 psi, observe and record the time required for the pressure to drop 1.0 psi from 3.5 to 2.5 psi. Pipes failing to maintain minimum acceptable holding times in accordance with the most current version of ASTM-C828 shall not be accepted.

C. Mandrel Testing: All PVC sewer lines shall require Mandrel testing in addition to air test acceptance to determine if they are within the allowable deflection tolerance. The Contractor shall perform the deflection test by utilizing an approved go/no go multi-arm mandrel which meets ASTM D-3034 dimensions for 7.5 percent deflection limit.

D. Manhole Testing: Manholes shall be tested using one of the methods listed below. Manholes may be tested for leakage at the same time that gravity sewer lines are being tested for leakage. Manhole inverts shall be completed before testing is performed.

a. Vacuum testing shall include vacuum pump, certified vacuum gauge with a range of 0 to 30 inch mercury (Hg.), sealing element with manhole support brace and air pressure to monitor the inflatable sealing ring. Evacuate the manhole to 10 inches Hg. for the specified test period using the chart provided. If the vacuum drops less than one inch mercury within the test time the manhole is considered acceptable.

b. When exfiltration testing is used, the allowable leakage shall not exceed one-half gallon per hour. This equates to 0.25 or ¼-inch per four hour test period. The inflatable plugs or stoppers shall be positioned in the lines far enough from the manhole to ensure testing of those portions of the lines not air tested. The manhole shall then be filled with water to the top of the

manhole rim. A 24-hour soak shall be allowed prior to testing. After test completion the water shall be pumped from the manholes and disposed of properly.

c. Under no circumstances shall water be allowed to enter the existing sanitary sewer system. If water drop in manhole exceeds the allowable leakage during the test period the Contractor shall make repairs or replacement at no cost to the County and retest as specified above.

E. In addition to passing air test requirements, sanitary sewer sections below the ground water table shall be tested using the following infiltration test procedure. The Contractor shall provide all material, labor and equipment for the infiltration tests.

a. Plug upper section of pipe system after flushing and cleaning section in conformance with paragraph B above. Place a weir in the downstream invert of pipe in a plumb and level position. Read the infiltration after an elapsed time of 30 minutes with the line of sight level to the weir line. Flow rates shall not exceed 100 gal./day/inch of diameter/mile. Readings that exceed 100 gal./day but are below 1,500 gal./day shall be remeasured using a weir with spout such as the –"Pomon-o-Weir" or equivalent.

F. Sewer sections containing a large amount of lateral volume or sewer sections partially submerged, shall be air-tested using the appropriate criteria stipulated in ASTM Designation C-828 to ensure accuracy of the test procedure.

VACUUM TEST TABLE

Specified test period for vacuum to
Drop less than one-inch mercury

Manhole Depth In Feet	4-Foot Inside Diameter (seconds)	5-Foot Inside Diameter (seconds)	6-Foot Inside Diameter (seconds)
8	20	26	33
10	25	33	41
12	30	39	49
14	35	46	57
16	40	52	65
18	45	59	73
20	50	65	81
22	55	72	89
24	59	78	97

26	64	85	105
28	69	91	113
30	74	98	121

AIR TEST TABLE

Based on Equations from ASTM C828

SPECIFICATION TIME (min:sec) REQUIRED FOR PRESSURE DROP
FROM 3-1/2 to 2-1/2 PSIG WHEN TESTING ONE PIPE DIAMETER ONLY

PIPE LENGTH (FEET)	PIPE DIAMETER, INCHES 4	6	8	10	12	15	18	21	24
25	0:04	0:10	0:18	0:28	0:40	1:02	1:29	2:01	2:38
50	0:09	0:20	0:35	0:55	1:19	2:04	2:58	4:03	5:17
75	0:13	0:30	0:53	1:23	1:59	3:06	4:27	6:04	7:55
100	0:18	0:40	1:10	1:50	2:38	4:08	5:56	8:05	10:34
125	0:22	0:50	1:28	2:18	3:18	5:09	7:26	9:55	1:20
150	0:26	0:59	1:46	2:45	3:58	6:11	8:30		
175	0:31	1:09	2:03	3:13	4:37	7:05			
200	0:35	1:19	2:21	3:40	5:17				
225	0:40	1:29	2:38	4:08	5:40				
250	0:44	1:39	2:56	4:35					
275	0:48	1:49	3:14	4:43					
300	0:53	1:59	3:31						
400	1:10	2:38							
450	1:19	2:50							
500	1:28	2:50	3:47	4:42	5:40	7:05	8:30	9:55	11:20

PART 4 - MEASUREMENT AND PAYMENT

4.2 Sewer Service Connections

Sewer service connections shall be measured in linear feet along the center line of the main sewer, from the center line of main sewer to the end of the cap of where tied into the existing line. Payment for house connections shall include the plumbing permit, demolition, excavation, backfill, restoration of roadways as shown in Standard M-6.1, all

other restoration , tapping main sewer, pipe, fittings, and all additional work required to provide a complete and operable house connection.

4.3 Sanitary Sewer Force Mains

Measurement and payment shall be as per Section 02500, and shall also include thrust blocks, anchorage, and any other restraint required.

4.6 Drop Connections

Drop connections for the various sizes and depths shown on the bid proposal shall be measured as each. Payment shall be at the unit price stated in the bid proposal and shall include all materials, labor and other work necessary to provide a complete and operable installation.

PART 1 - GENERAL

1.1 Description of Work

Provide all labor, materials, equipment to inspect sewer pipes using closed circuit television technology as specified herein.

1.2 Related Work Specified Elsewhere

Section 02500 – Gravity Sewers and Appurtenances
Section 02505 – Storm Sewers
Section 02510 - Sanitary Sewers & Appurtenances

1.3 Applicable Specifications

A. National Association of Sewer Service Companies (NASSCO)

1.4 Submittals

Provide copies of the inspection and electronic reports complying to NASSCO Pipeline Assessment and Certification Program (PACP) standards for all segments of sewer and manholes inspected.

1.5 Quality Assurance

A. The vendor performing the Television Inspections shall hold a valid NASSCO PACP certification.

PART 2 - MATERIALS

2.1 Equipment

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 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 Project Officer. The Equipment shall provide a means of accurately measuring distance from manhole or other structure to an accuracy of no less than 6 inches.

PART 3 - EXECUTION

3.1 General

A. After cleaning, all sewer sections shall be visually inspected by means of closed-circuit television. The inspection shall be done one segment at a time from manhole to manhole and the flow in the section being inspected shall be suitably controlled. All CCTV inspections and documentation shall be performed in accordance with NASSCO PACP standards including the specific date and time of inspection.

B. The camera shall be moved through the line in either direction at a moderate rate, stopping when necessary to permit proper documentation of the sewer's condition and any connections. In no case shall the television camera be pulled at a speed greater than 30 feet per minute. 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. If, during the inspection operation, the television camera shall not pass through the entire sewer segment between manholes, the Contractor shall set up his equipment so that the inspection can be performed from the opposite manhole. If, again, the camera fails to pass through the entire sewer segment, the inspection shall be considered complete and noted as "Survey Abandoned" with the specific reason.

C. 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 insure good communications between members of the crew.

D. The Contractor shall stop the camera and visually inspect all entering pipe connections and other features of interest.

3.2 Documentation

A. All documentation shall clearly reference the adjacent structure numbers for each segment of pipe inspected.

B. Electronic media location records shall be kept by the Contractor and shall clearly show the location, by distance in 1/10 of a foot or nearest mm, from the manhole wall, in relation to an adjacent manhole of each infiltration point observed during inspection. In addition, other points of significance such as locations of building sewers, unusual conditions, roots, storm sewer connections, cracks, fractures, broken pipe, presence of scale and corrosion, and other discernible features, as defined in the PACP defect codes, shall be recorded on electronic media and a copy of such records shall be supplied to the Owner.

C. Digital photographs of the pipe condition and all defects shall be taken by the Contractor. Photographs shall be located by distance, in increments of 1/10 of a foot, from the adjacent manhole or structure wall.

D. Electronic media recordings shall be in a format and media which is acceptable to the Project Officer.

E. The Contractor shall report any evidence of illicit discharges or illicit connections to the storm drain system to the Department of Environmental Services.

PART 4 - MEASUREMENT AND PAYMENT

4.1 Television Inspection

Where specifically included as a payment item, payment shall include the labor, materials, equipment, operations, maintenance of traffic, operational modifications to the existing system, and any other work required to perform Television Inspections. If not included as a specific pay item, Television Inspection should be considered incidental to the installation of any new sewer and no separate payment shall be made for the Television Inspection.

PART 1 - GENERAL

1.1 Description of Work

Provide all plant, labor, supervision, materials and equipment to install all water pipe and appurtenances to the lines and depths as called for on the approved plans and as described herein for a complete and operable water distribution system.

1.2 Related Work Specified Elsewhere

Section 02200 - Earthwork for Structures and Pipelines
Section 02650 – Restoration of Roadways
Section 02950 - Tunneling
Section 02951 - Boring and Jacking

1.3 Applicable Codes, Standards, and Specifications

A. American National Standards Institute (ANSI)
B. American Society for Testing and Materials (ASTM).
C. American Water Works Association (AWWA).
D. National Fire Protection Association (NFPA)
E. Arlington County Fire Protection Code (Chapter 8 of the Arlington County Code)
F. Arlington County Plumbing Code (Chapter 18 of the Arlington County Code).
G. Arlington County Utilities Code (Chapter 26 of the Arlington County Code).
G. Plumbing Code adopted by the State of Virginia

1.4 Applicable References

A. Erosion and Sediment Control Ordinance (Chapter 57 of the Arlington County Code).
B. Virginia Department of Health (VDH) Waterworks Regulations (12 VAC 5-590)
C. Arlington County Municipal Separate Storm Sewer System Permit
D. Arlington County Dechlorination Policy Acknowledgement form
E. Arlington County Dechlorination Plan form
F. Arlington County Dechlorination and Disposal Procedures
G. Virginia Department of Health WaterWorks Regulations (VR 355-18-000)

1.5 Submittals

Submit full descriptions and details of all pipe, valves, hydrants, and other appurtenances proposed for the project Per Section 01300 Submittals.

1.6 Quality Assurance

A. The manufacturer shall provide facilities or a certified laboratory for conducting load bearing and other tests required by the referenced specifications such as the ASTM.

B. The Engineer shall inspect pipe, fittings and joint material upon delivery to the site. The Contractor shall provide ample space between rows of stockpiled pipe to facilitate adequate inspections.

PART 2 - MATERIALS

2.1 General

A. All materials shall be suitable for 150 pounds per square inch (psi) working pressure unless otherwise indicated.

B. Pipe of the same size and material shall be furnished by the same manufacturer. Each pipe length and fitting shall be clearly marked with the manufacturer's name, trademark and class of pipe.

C. Materials shall be recently manufactured and unused. Only previously approved manufacturers items may be furnished.

2.2 Iron Pipe

A. Iron pipe shall be ductile iron conforming to AWWA C151 (ANSI A21.51), class 53 minimum for 6-inch pipe and class 52 minimum for 8-inch and larger pipe. Pipe shall be single cement lined conforming to AWWA C104 (ANSI A21.4) and shall have mechanical or push-on joints utilizing rubber gasket rings, conforming to AWWA C111 (ANSI A21.11). Coatings shall be bituminous 1.0 mil. thick.

B. Fittings shall be mechanical joint ductile iron conforming to AWWA C110 (ANSI A21.10), with a minimum pressure rating of 250 psi, or ductile iron compact grade conforming to AWWA C-153 (ANSI 21.53) with a minimum pressure rating of 350 psi. Fittings shall be cement lined conforming to ANSI A21.4.

C. Polyethylene encasement with a minimum thickness of 8-mils shall be applied to all underground ductile pipe installations and shall comply with the installation and material requirements of AWWA C-105 and ANSI A21.5. All pipes, fittings, valves, hydrants and branch connections shall be encased as shown on approved plans. All holes and openings of any size shall be repaired in accordance with the manufacturer's recommendations.

2.3 Tie Rods and Accessories for Anchorage and Mechanical Joint Restraints

A. Tie rods, tie bolts and accessories shall be manufactured of Cor-Ten corrosion resistant steel, ASTM-A242, Super Star series of Star National Products or approved equal.

B. Mechanical joint restraints shall be used with all water main appurtenances as directed or as approved by the engineer. Mechanical joint restraint shall be incorporated in the design of the follower gland and shall include a restraining mechanism which, when actuated imparts multiple wedging action against the pipe, increasing its resistance as the pressure increases. Restraining devices shall be manufactured of ductile iron. Torque limiting twist off nuts shall be used to insure proper installation of the restraining device. The minimum working pressure shall be at least 250 psi and shall be manufactured by EBAA iron, inc., MEGALUG or approved equal.

2.4 Gate Valves

A. Gate valves, 4-inch through 12-inch, for buried installation shall be ductile or grey cast iron, resilient wedge type, O-ring sealed, non-rising stem, fitted with a 2-inch operating nut opening left, with mechanical joint and/or flanged ends, as indicated on the drawings. Valves shall conform to AWWA C-509 (grey iron) or C-515 (ductile iron) requirements. Provide buried valves with valve boxes. Provide extension stems extended within two feet of finished grade if required for valve depth. Valves shall be American Flow Control Series 2500-1, Mueller A-22360, U.S. Pipe USPO valve, Kennedy KS, or approved equal.

B. Gate valves 14" and larger shall be iron body with fusion epoxy coating conforming to AWWA C 550 bronze mounted, double disc, resilient wedge, O-ring sealed, non-rising stem, fitted with a 2" operating nut opening left, with mechanical joint and/or flanged ends as indicated on the drawings. 14" gate valves may be installed in vaults or buried with valve boxes and extension stems placed within two feet of finished grade if required for valve depth. Gate valves 16" and larger shall be installed in

vaults with or without NRS bypass valve as indicated on the drawings. Valves shall conform to AWWA C-500 requirements and shall be Mueller Co. 2360 series or approved equal.

C. Gate valves 3" to 8" for water meter and/or fire line vault or interior installation shall be iron body, bronze mounted, resilient wedge , bolted bonnet, 250 psig maximum working pressure class 125 psi, outside screw and yoke, rising stem with hand wheel, opening left, with flanged ends. Valves shall be Mueller Co. 2360 series or approved equal.

D. Gate valves 2" and smaller shall be bronze body, solid disc, union bonnet, class 150 psi minimum, non-rising stem with hand wheel, opening left, with inside threaded ends. Valves shall be Stockham Model B-128 , Crane Model No. 426, or approved equal.

2.5 Butterfly Valves, Check Valves and Cone Valves

Butterfly, check, and cone valves shall be as directed by the Engineer on a special project basis.

2.7 Fire Hydrants

A. Fire hydrants shall be dry top, dry barrel compression type, with a valve opening of 5-1/4inches, double 0-ring seals and safety flange, and shall conform to AWWA C502 requirements.

B. Hydrants shall be provided with two 2-1/2 inch hose outlets and one 4-inch pumper outlet with threading conforming to NFPA No. Standard 1963, *Standard for Fire Hose Connections*, requirements for American National Fire Hose Connection Screw Threads (NH), 6-inch mechanical joint inlet connection, National Standard 1-1/2 inch pentagon operating nut and outlet cap nuts, chains on outlet caps, and harnessed lugs. Hydrants shall open left and counterclockwise. Fire hydrants shall be painted with an exterior type industrial coating enamel. The upper barrel including bonnet and hose nozzle caps shall be painted "National Standard Yellow" using Duron Duraclad 12-10611 or approved equal. Hydrants shall be Mueller Super Centurion 250, American AVK or approved equal.

2.8 Valve Boxes

Valve boxes shall be of the two-piece, sliding type 5-1/4-inch shaft, cast iron kind. Valve box shall read “Water” Valve boxes shall be as manufactured by Bingham and Taylor Company, Capitol Foundry, or Tyler Company and conform to their standard dimensions.

2.9 Copper Pipe

Copper pipe shall be seamless water tube, AWWA type K conforming to ASTM designation B88 requirements. Fittings shall be underground copper service flared type.

2.10 Water Meters and Services by Arlington County

Water meters, including taps, pipe fittings, meter box and accessories from the water main through the meter, shall normally be furnished and installed by the Arlington County Department of Environmental Services (DES) after payment of the appropriate fee. The connection from the back side of the meter installation to the building shall be installed by the owner's plumber.

2.11 Water Meters and Services by Contractor

A. The Department of Environmental Services shall approve all water meter locations. Water meters shall be located in the utility strip or just behind the curb within public right-of-way or recorded easements and a minimum of 5 feet horizontally clear from other utilities, structures, or trees.

B. The Contractor shall assume complete responsibility for the installation, adjustments and any damage that may occur until final acceptance of the project.

C. New water mains shall pass all acceptance testing procedures before the installation of water service connections.

D. All services shall be installed by wet tap only. Service taps shall be located at the 10:00 and 2:00 position on the water main. Maintain a minimum of 12 inches between taps. Direct taps are allowed for ¾ inch and 1 inch connections. Use approved saddles for 1 ½ inch and 2 inch connections.

E. Water service lines shall have a minimum of three feet of cover and shall be approved by the engineer, from the main to the meter prior to backfilling. Meter settings for 1-inch to 2 inch services shall be a minimum of 18-inches and a maximum of 24-inches below the meter box cover. Meter box covers shall be painted black with an exterior type of rust resistant enamel.

F. Meter boxes, meter box covers, corporation stops, angle valves, yoke ells, yoke bars and all other appurtenances (except the water meter) necessary for a complete installation shall be provided in accordance with the

approved plans, specifications and requirements of DES. Meter box covers shall be furnished by Bingham and Taylor, Capitol Foundry, or approved equal.

2.12 Air Release Valves

Air release valves shall be constructed of cast iron body and cover conforming to ASTM A126.GR.B requirements. The float shall be stainless steel conforming to ASTM A240 requirements. Air release valves shall be manufactured by Apco, Crispin or approved equal.

2.13 Tapping Sleeves and Valves

Tapping sleeves and valves shall conform to the applicable requirements specified herein for installation on the existing type of pipe described below.

A. Iron Pipe: The tapping sleeve shall have an iron body, mechanical joint, with gaskets, suitable for installation on the existing iron pipe. The tapping sleeve shall be as manufactured by Mueller Company No. H-615 or approved equal. Tapping valves shall conform to the applicable requirements specified herein for gate valves. All stainless steel tapping sleeves shall be type 304 stainless steel with stainless steel flange and full circumferential seal as manufactured by JCM style 432 and Ford style FAST or approved equal.

B. Concrete Pipe: The tapping sleeve shall be in accordance with AWWA Manual M9. The sleeves shall have a separate gland which permits installation of the sleeve prior to the cutting of the prestress wires. The gland shall have a fusion epoxy coated (per AWWA C-213-79) waterway, and a broad gasket set in a retaining groove of a draw flange to eliminate flexing. The gland shall be equipped with load bearing set screws to protect the cylinder. Sleeves shall be furnished with grouting seals and grout horns to facilitate filling the space between the sleeve and the pipe. Tapping sleeves shall be JCM 415 or approved equal.

2.14 Inserting Valves

Inserting valves shall be EZ Valve as manufactured by Advanced Valve Technologies, LLC, InsertValve™ or approved equal

2.15 Service Clamps

Service clamps shall have cadmium zinc plated be double steel straps and ductile iron body with corporation stop thread of appropriate size, neoprene gasket cemented in place, cadmium zinc plated nuts and straps and shall be the diameter required. Clamps shall be as

manufactured by Ford, Mueller, Romac Industries, Smith Blair, JCM Industries or approved equal.

2.16 Manhole Frames and Covers

Manhole frames and covers shall conform to the requirements of Section 02500 Gravity Sewers, or as specified on the plans.

2.17 Manhole Steps

Manhole steps shall conform to the requirements of Section 02500 Gravity Sewers

PART 3 - EXECUTION

3.1 Water Main Design Criteria

Water mains shall be designed and installed to conform to Arlington County Standards and Specifications, the Virginia Department of Health Waterworks Regulations, American Water Works Association Standards and the following design criteria:

A. If required by DES, detailed design calculations shall be submitted to substantiate line sizes and to demonstrate that the minimum pressure of 20 psi, as stated in Section 12.10 of the Virginia Department of Health Waterworks Regulations, shall be met for average daily demands, peak hourly demands, and maximum daily demand plus fire flow. The final size of all water mains and appurtenances shall be determined by DES.

B. The hydraulic conditions at the points of proposed connection of the existing Arlington County water system shall be defined. DES shall provide the hydraulic conditions at the node closest to the point of connection (i.e., fire flow test results). The designer of the proposed water system shall model the water system network starting from the node of the water system for which Arlington County has supplied the starting hydraulic conditions. Requests for computer modeling or fire flow test information shall be addressed to DES. The request for computer modeling shall include a sketch plan indicating the location of proposed development, size of building, type of occupancy, number of occupants, estimated average daily demand, maximum daily demand, peak hourly demand and fire flow demand based on the Arlington County Fire Prevention Code requirements for all buildings within the proposed development. Required fire flow calculations shall be provided on the cover sheet of the approved plans.

C. Water mains shall be 8-inch diameter minimum (unless otherwise approved by DES) and shall be looped wherever possible. Dead end mains shall not exceed 600

feet without approval from DES and shall have blow-offs or fire hydrants for flushing. No flushing device shall be directly connected to any sewer.

D. Water mains shall be located in street right of way and 7 feet off of face of curb wherever possible. The water main shall extend the full frontage of the property being served unless directed otherwise by DES. Water mains shall not be located longitudinally under walks. Water mains, water meters, fire hydrants and blow offs shall be publicly maintained and as such shall be installed within recorded easements on private property when locations in public right of way are not possible. Such easements, measuring 20 feet in width, shall be recorded prior to final approval and issuance of building permits.

E. Water mains shall have a minimum cover of 4 feet measured from the top of pipe to the proposed finished grade directly above the waterline; however, 3 feet minimum cover may be used for short distances to avoid utility conflicts and excessive depth of water main. Mains shall be laid on continuous grades to avoid sags or crests in the line.

F. The minimum clear horizontal separation between water mains and sewer mains or sewer manholes shall be 10 feet (conforms to VDH Waterworks Regulation 12 VAC 5-590-1150). When local conditions prevent a minimum horizontal separation of 10 feet between water mains and sewer mains or sewer manholes, a closer separation may be allowed provided that:

1. Sewer manholes shall be of watertight construction and tested in place.

2. The bottom (invert) of the water main shall be a minimum of 18 inches above the top (crown) of the sewer. The water main and sewer pipes shall be kept in separate trenches. Where minimum vertical separation cannot be obtained, the sewer shall be constructed of ductile iron pipe and pressure tested in place without leakage prior to backfilling.

G. No water mains shall pass through or come in contact with any part of a sewer manhole.

H. Water mains crossing over sewers shall be laid to provide a minimum vertical separation of 18 inches between the top of the sewer and the bottom of the water main. If local conditions prevent this, the water main shall be relocated to provide the separation directed by the Engineer, or the sewer shall be constructed of ductile iron pipe pressure tested in place without leakage before backfilling and with no joint of the sewer closer than 8 feet of the water main.

I. Water mains crossing under sanitary sewers shall be protected by the following provisions:

1. A minimum vertical separation of 18 inches between the top of the water main and the bottom of the sewer.

2. Sewer shall be constructed of ductile iron pipe, pressure tested in place without leakage before backfilling.

3. Adequate structural support for the sewer to prevent excessive joint deflection and the settling on and breakage of the water main. Refer to Standard Drawing M-7.0.

4. One length of the water pipe shall be centered at the point of crossing so that the joints are equidistant and as far as possible from the sewer.

J. Water mains crossing over surface waters shall be adequately supported, protected from freeze damage, accessible for repair or replacement, and above the 100-year flood elevation.

K. Water mains crossing under surface waters shall be protected by the following provisions:

1. The pipe shall be of special construction, having flexible watertight joints.

2. Valves shall be provided at both ends of the water crossing so that the section can be isolated for tests or repair; the valves shall be easily accessible and not subject to flooding.

3. Sample taps shall be available at each end of the crossing at a reasonable distance from each side of the crossing and not subject to flooding.

4. Permanent taps shall be made for testing and locating leaks.

L. The minimum clear horizontal separation between water main and utilities other than sanitary sewer shall be 5 feet (see 3.1.F for separation between water main and sanitary sewer).

M. The minimum vertical clearance between water main and utilities other than sanitary sewer shall be 1.0 foot, unless provisions to prevent damage to the underlying utility are detailed for approval by DES.

N. The minimum horizontal separation between water main and buildings or other structures shall be provided as follows:

1. Ten feet for water mains less than 16 inches and 10 feet or less in depth.

2. Fifteen feet for water mains 16 inches and larger or all mains in excess of 10 feet in depth.

O. Valves shall be provided on all mains at major intersections and on branch mains at minor intersections. Four valves are required at crosses and three at tees unless otherwise approved by DES. Line valve spacing shall be 500 feet maximum for water mains 12 inches and smaller and as determined by DES for mains larger than 12 inches. Valve boxes shall be set and adjusted flush with the roadway surface. Where valves boxes are located in off street areas they shall be set flush in a 2’ x 2’ x 6” concrete pad.

P. Automatic air release valves shall be installed on water mains according to the following provisions (conforming to VDH Waterworks Regulation 12 VAC 5-5901160):

1. Air release valves shall be located at "strategic" high points as directed or approved by DES.

2. Refer to the standard drawings for air release valve settings.

3. Air release valve and piping shall be two inches unless directed or approved otherwise by DES.

4. Air release valves shall not be located in areas subject to flooding or high water table. In cases where such locations cannot be avoided, sump pumps and special vent piping shall be required as directed by DES.

5. Tapping saddles shall be used.

6. Chambers containing air release valves shall not be connected directly to any storm drain or sanitary sewer, nor shall air release valves be connected directly to any sewer. Chambers shall be drained to the surface of the ground where they are not subject to flooding by surface water or to absorption pits located above the seasonal groundwater table elevation. Sump pumps may be used where other means are not practical.

Q. Water meters shall be located in the utility strip or just behind the curb and a minimum of 5 feet clear of driveways and other vehicular traffic areas. A clear space 5 feet by 5 feet shall be permanently provided for 2 inch and smaller water meters. A clear space 20 feet by 15 feet and 10 feet deep shall be permanently provided behind the curb for 3- and 4-inch water meter vault installations. A clear space 25 feet by 20 feet and 10 feet deep shall be provided for 6-and 8-inch meter vault installations. Water meters sizes greater than 8-inches shall be approved by DES.

R. No water service taps shall be made without special approval from DES in transmission mains 16 inches and larger.

S. Backflow prevention devices shall be installed at each service connection to a consumer's water system when specified by the Arlington County Department of Community Planning, Housing & Development (DCPHD) - Inspection Services Division that a potential health, pollution or system hazard to the waterworks exists. Refer to the Arlington County Cross Connection and Backflow Prevention Control Ordinance for more information.

T. All plans and specifications for construction of proposed water distribution facilities must be approved by DES. No water distribution facility shall be constructed without approved plans, shop drawings and construction cut sheets.

U. All existing segments of water main to be cut and capped shall be strapped or thrust blocked as directed by DES.

V. Blow offs for water mains shall be provided at all “strategic” low points and all terminal points. Fire hydrants may be used in lieu of blow offs as directed by DES. Blow offs shall be installed in meter boxes and located behind the curb line and clear of driveways and other vehicular traffic areas (refer to Standard Drawing W4.0).

3.2 Fire Protection Requirements

Waterworks systems shall be designed to deliver a minimum residual pressure of 20 psi with fire flow requirements and maximum daily demands applied to the system. Applicable fire flow shall be selected based on the requirements of Appendix B of the Arlington County Fire Prevention Code. The required fire flow may be reduced by up to 75% for buildings protected throughout with automatic sprinkler systems complying with the requirements of the Virginia Uniform Statewide Building Code, but in no case shall the flow be less than:

(1) One and Two family dwellings - minimum exposure distances of:

less than 10'	1,500 – 2,000 gallons per minute (gpm)
10' - 30'	1,000 – 1,500 gpm
greater than 30'	1,000 gpm

(2) Other than One and Two-family dwellings: 1,500 gpm

B. Fire Hydrants

1. Fire hydrants shall be located behind the curb line in accessible areas. Maximum spacing shall be 500 feet in residential areas and 300 feet in commercial and high-density areas.

2. Building siamese fire line connections shall be located within 75 feet of fire hydrants or as approved by the Arlington County DCPHD - Inspection Services Division.

3. Actual fire hydrant locations are subject to approval by the Arlington County Fire Marshal and DES.

4. Fire hydrants shall not be installed on lines less than 8 inches in diameter or on lines not adequately sized to carry fire flows. Installation of fire hydrants on 6 inch water mains may be approved in special case determined by DES.

5. Connect hydrants to the water main with a minimum 6-inch ductile iron branch controlled by an independent gate valve. Hydrants shall stand vertically plumb with the center of the 4-inch pumper nozzle a minimum of 18 inches above the top of curb on streets with curb and gutter or a minimum of 18 inches above the elevation of the edge of the shoulder on streets without curb and gutter. Provide vertical offsets or bends as required to set hydrants at proper grade. The maximum bury depth shall be 6 feet.

6. No plantings or erection of other obstructions shall be made within 5 feet of any fire hydrant.

7. All hydrants, fire line valves and fittings shall be strapped or thrust blocked as approved by DES (refer to Standard Drawing W-7.0).

8. Drainage fill shall be provided to prevent the ponding of water around hydrants.

9. Fire hydrants shall be installed five feet from the point of curvature of curb returns or at the property line between properties in subdivisions or other areas where fire hydrants are installed between intersections.

10. Fire hydrants shall be drained to dry wells provided exclusively for this purpose.

11. Fire hydrants shall not be located in areas subject to high groundwater, flooding, contaminant or pollutant spills, or in areas where surface water ponds. If there exist no alternative location, weepholes on the hydrant shall be plugged and the hydrant shall be marked for seasonal dewatering or the weephole drainage shall be piped to daylight with the pipe end screened.

12. Fire hydrants shall be placed so that the top operating nut is a minimum of 18 inches and a maximum of 2 feet back from the face of curb unless otherwise directed by the Arlington County Fire Marshal or DES.

13. Fire hydrants shall be installed within recorded easements on private property when locations in public right of way are not possible.

3.3 Minimum Requirement for As-Built Plan

Prior to acceptance of water mains and appurtenances, the Contractor shall submit to Arlington County DES, a set of mylar tracings and CD indicating the as-built conditions. Such submittals shall be made prior to Request for Final Payment. The As-Built record drawings shall include the following:

i) Changes in valve and fire hydrant locations.

ii) Horizontal line changes and/or location of water main appurtenances changes.

iii) Any changes in water main profiles greater than 6-inches.

iv) Actual materials, limits of mechanical joint restraints and location of reaction blocking used on the project.

v) Water main to meter distances and locations of all water service meters and water service lines.

vi) Show actual location, depth or elevation, type and size of all utility crossings.

vii) Provide a minimum of two (2) swing ties to all valve boxes and permanent blow offs from fixed permanent objects visible above snow cover such as

fire hydrants, utility poles or building corners. Swing ties shall cross as near to ninety degrees as practical for each valve box and blow off located.

viii) Statement from the Contractor that the As-Built construction record drawings are in substantial conformance with the associated design drawings unless otherwise noted on the as-built plans.

3.4 Construction Standards

A. Laying Pipe

1. Use proper and suitable tools for the safe handling and laying of pipes and fittings. Prevent fitting linings and coatings from being damaged; damaged pipe shall be replaced or repaired to the satisfaction of the Engineer.

2. Unless indicated otherwise, the depth of trench shall be sufficient to provide a minimum cover over the top of the pipe of 4.0 feet from the existing or proposed ground surface and to avoid interference of the pipeline with other utilities. Install pipe on continuous grades, as indicated on plans, to avoid sags or crests in the line.

3. The cutting of pipe for inserting valves, fittings, or closure pieces shall be done in a neat and workmanlike manner, without damage to the pipe, so as to leave a smooth end at right angles to the axis of the pipe. Outside edge of cut pipe shall be beveled and smoothed to avoid damage to the gasket. Avoid damage to the lining. Do not flame cut cast iron pipe with oxyacetylene torch.

4. Thoroughly clean pipes and fittings before they are laid.

5. Carefully lower pipe fittings into trench. Butt ends of pipe against each other in such a manner that there shall be no shoulder or unevenness on the inside of the pipe.

6. Ensure that pipe is well bedded on a solid foundation as shown in the standard details. Correct any defects due to settlement. Excavate bell holes sufficiently large to ensure making proper joints. Exercise precautions to include the furnishing and placing of aggregate to prevent any pipe from resting directly on rock. Rock found in trench shall be removed to provide a clearance of at least six inches below and on each side of all pipe, valves and fittings and shall be replaced with select fill.

7. Iron pipe shall be jointed in full accordance with AWWA Standard C600, the manufacturer's recommendations and the following requirements:

   a. Push-on joints shall be thoroughly cleaned. Brush-coat gasket retaining groove with approved gasket lubricant and insert the rubber gasket in the bell socket. Apply a thin film of approved gasket lubricant to the exposed gasket surface. Clean and center the spigot end of the pipe into the socket complete the joint by forcing the spigot end to the bottom of the socket.

   b. Mechanical joints shall be thoroughly cleaned. Lubricate the gasket and spigot. Place the gland on the spigot end, followed by the gasket, and the pipe end seated and centered in the socket. The gasket shall then be seated in the sockets, gland moved into position and bolts and nuts loosely assembled by hand. Tighten with a wrench.

8. At the close of work each day, close end of the pipeline with an expansion stopper so that no dirt or other foreign substance may enter the line. Keep this stopper in place until pipe laying is resumed.

9. Remove and replace all defective materials at no additional cost to the County.

B. Connections to Existing Mains

1. Notify the Engineer two (2) working days prior to scheduling work on existing water mains (notify Engineer on Thursday before proposed Monday work). No connections shall be scheduled for the day before weekends and holidays. Connect new water mains to the existing mains as shown on the drawings. Verify the location, type of pipe and size of the existing main well in advance of any work on the connection. The Contractor shall give DES at least five (5) days' notice of the need to shut down existing water mains so that DES may give advanced notice to the affected customers. Shutdowns in service, where permitted, and operation of any valves on the existing system shall be done only by DES. To minimize shutdown time, connections to water lines shall be made by the Contractor only after complete preparations for such work have been done to the satisfaction of the Engineer.

2. Reaction backing at connections to existing mains shall be made with high early strength concrete. In the event that line pressure

must be restored less than 48 hours after the placement of reaction backing at these connections, provide temporary deadman and/or similar devices as required to maintain stability of the water mains.

C. Installing Valves and Fittings

1. Install valves, fittings, and caps to pipe in the manner herein before specified for laying pipe. Provide valve boxes for each buried gate valve. Boxes shall not transmit shock or stress to the valve. Center and plumb boxes over the operating nut of the valve, with the box cover flush. Valves shall be strapped to adjacent fittings unless directed otherwise.

2. Inserting valves and tapping sleeves and valves shall be installed in accordance with the valve manufacturer's recommendations. Test pits shall be dug by the Contractor to determine type and size of existing pipe and suitability of tapping location on the pipe.

D. Thrust Restraint

Provide caps, tees, bends and inserting valves in water mains with reaction backing and other joint restraints such as "MEGALUG", manufactured by EBAA Iron, Inc., or approved equal, except where tie rods are specified or indicated. Reaction backing shall consist of concrete thrust blocks as shown on the Standard Details. Valves for connections to future lines, fire hydrants and related valves, and other fittings or valves so indicated shall be anchored by steel rods protected by two coats of acid-resisting asphalt paint.

The use of reaction backing may be waived in the sole discretion of DES if the designer provides calculations to indicate an adequate number of joints are restrained in proximity to caps, tees, bends and inserting valves. The limits of restraints shall be indicated clearly on the approved plans.

E. Water Service Connections

1. Water meters, including taps, pipe fittings, meter box, and accessories from the water main through the meter, shall normally be furnished by, and installed by, Arlington County after payment of the appropriate fee. Connections from the meter installation to the building shall be installed by the Contractor.

2. The Department of Environmental Services shall approve all water meter locations. Water meters shall be located in the utility strip or just behind the curb within public right-of-way or recorded

easements and a minimum of 5 feet horizontally clear from other utilities, structures, or trees.

3. The Contractor shall assume complete responsibility for the installation, adjustments and any damage that may occur until final acceptance of the project.

4. New water mains shall pass all acceptance testing procedures before the installation of water service connections.

5. All services shall be installed by wet tap only. Service taps shall be located at the 10:00 and 2:00 position on the water main. Maintain a minimum of 12 inches between taps. Direct taps are allowed for ¾ inch and 1 inch connections. Use approved saddles for 1 ½ inch and 2 inch connections.

6. Water service lines shall have a minimum of three feet of cover and shall be approved by the engineer, from the main to the meter prior to backfilling. Meter settings for 1-inch to 2 inch services shall be a minimum of 18-inches and a maximum of 24-inches below the meter box cover. Meter box covers shall be painted black with an exterior type of rust resistant enamel.

7. Where specified that Contractor shall install the water service, meter boxes, meter box covers, corporation stops, angle valves, yoke ells, yoke bars and all other appurtenances (except the water meter) necessary for a complete installation shall be provided in accordance with the approved plans, specifications and requirements of DES. Meter box covers shall be furnished by Bingham and Taylor, Capitol Foundry, or approved equal.

F. Abandoning Existing Water Mains

1. Drain and abandon existing water mains not required in the completed system. Abandoned mains and appurtenances that conflict with proposed construction shall be removed as required. Abandoned mains not removed shall be capped or bulk headed at all open ends.

2. Valves to be abandoned shall be removed along with the valve box, or if abandoned in place, the valve box shall be removed and the

resulting void shall be stabilized via use of flowable fill or other approved means to avoid any future settlement.

3. Cut and cap the existing water mains to remain in service at the locations indicated on the drawings, and provide with thrust block. Keep the length of pipe removed to the minimum necessary for installing the cap and concrete blocking. A cap shall be placed over the end of the pipe to be abandoned. The concrete thrust block shall be placed to bear against undisturbed ground. After this work has been completed, the capped line shall not be recharged unless so directed by the Engineer.

4. Existing fire hydrants not required in the completed system shall be carefully removed, cleaned and transported to the County storage yard. Cap and anchor hydrant lead as close as possible to its control valve with concrete thrust block and tie rods if main is to remain in service.

5. Existing water services shall be discontinued by DES unless a written request is provided to DES for the temporary use of the service during construction. Water meter boxes and vaults shall be removed by the Contractor. Water meters shall be removed by DES as required. No credit or allowance shall be given for discontinued water services.

G. Disinfection of Water Mains

1. When each pipe length has been placed and shut off, disinfect each section of the water main. Provide all labor, materials and equipment to perform the disinfection operations in compliance with all state and local regulations. Disinfection shall conform to AWWA C601 and C51 requirements.

2. Water for disinfection, flushing and testing shall be furnished to the Contractor from the existing water system at no charge to the Contractor. Schedule water usage with the Engineer to result in a minimum interference to water service throughout the existing water system. Temporary connections to the existing water system shall be provided and removed by the Contractor and shall include approved means to prevent backflow and possible contamination of the existing water system. Temporary taps for removing air and flushing the main shall be provided by the Contractor as necessary.

3. Disinfection of the water main shall be accomplished in the following manner:

   a. Preliminary Flushing of Mains: All mains shall be flushed prior to disinfection except when the tablet method of disinfection is used. The mains shall be flushed at a minimum velocity of 3 feet per second and all points in the main shall receive a minimum of five (5) consecutive minutes of flushing at this velocity, until the water runs clear.

   b. Form of Chlorine to be Used: Liquid chlorine, calcium hypochlorite or sodium hypochlorite may be used for disinfection. Liquid chlorine shall be used only when approved by the Engineer. Calcium hypochlorite and sodium hypochlorite shall be added to water to form a chlorine water solution before being used.

   c. Methods of Application: The chlorine shall be applied by continuous feed method or by the tablet method only (slug method shall not be used). The application shall be performed as follows:

      a) Continuous Feed Method: Potable water shall be introduced into the pipe line at a constant flow rate. Chlorine shall be added at a constant rate to this flow so that the chlorine concentration in the water in the pipe is at least 50 mg/L. The chlorinated water shall remain in the pipe at least 24 hours, after which, the chlorine concentration in the water shall be at least 10 mg/L.

      b) Tablet Method: Tablet method shall not be used if trench water or foreign material has entered the main or if the water is below 5°C (41°F). Tablets are placed in each section of pipe and also in hydrant branches and other appurtenances. A sufficient number of tablets shall be used to ensure that a chlorine concentration in the water in the pipe is at least 25 mg/L. The tablets shall be attached by an adhesive to the top of the pipe sections and crushed or rubbed in all appurtenances. The adhesive shall be acceptable to the Virginia Department of Health (VDH). When installation has been completed, the main shall be filled with water at a velocity of less

than one foot per second. The water shall then remain in contact with the pipe for at least 24 hours.

d. Contact Period: The chlorinated water shall be retained in the main for at least 24 hours during which time all valves and hydrants, in the section treated, shall be operated in order to disinfect the appurtenances. The tests for chlorine residual shall be made by the Contractor in the presence of the Engineer. The Contractor shall install corporation cocks and copper tubing for the tests at the locations indicated by the Engineer.

e. Flushing and Discharge: The Contractor shall be solely responsible for the disposal of all chlorinated water in accordance with these Specifications and with all applicable Local, State, and Federal regulations and permits.

H. Hydrostatic Testing

1. Pressure tests shall conform with Section 4 of AWWA Standard C600.

2. The water mains shall be tested for leakage by the Contractor at his own expense in the presence of the Engineer. All tests shall be conducted in a manner to minimize any interference with the Contractor's work or progress. A maximum of 2,000 linear feet of water main may be tested at one time.

3. The Contractor shall notify the Engineer when the work is ready for hydrostatic testing and tests shall be taken soon thereafter as practicable under the direction of the Engineer. Personnel for reading meters, gauges or other measuring devices shall be furnished by the Engineer, but all other labor, equipment, water and materials, excluding meters and gauges, shall be furnished by the Contractor.

4. The water mains, including all appurtenances, shall be tested as a whole or in sections, valved or bulkhead at the ends. Test piping under a hydrostatic pressure of 200 psig unless shown otherwise on the approved plans. Testing shall not be conducted against existing valves. Apply pressure to the piping after it has been purged of air. Maintain water pressure for a minimum of two hours. The test pressure shall not vary by more than 5 psi during the test. Testing procedures shall be in accordance with AWWA Standard C600 with

the exception that in no case shall the measured leakage exceed 10 gallons/ inch of diameter/mile/day.

I. Final Flushing

All water mains shall be flushed after the acceptance of the hydrostatic test and before bacteriologic testing. The water mains shall be flushed at the highest flow possible through hydrants and/or blow-offs. The operation of any valves on the existing water system shall be done only by DES. Water discharged to the environment, storm, or sanitary sewer system shall be done in accordance with these specifications and all applicable regulations.

J. Bacteriologic Test

After chlorination, hydrostatic testing and final flushing, and before the water main is placed in service, samples shall be collected from the main and tested for enteric bacterial contamination and shall show the absence of coliform organisms. At least two (2) sets of consecutive satisfactory bacteriological samples shall be obtained from the distribution system before the system can be placed into service.

Samples shall be collected in one of the following manners:

A. At all accessible locations not exceeding 1,200 feet apart in the line downstream from where the pipe was filled with water. After the initial samples are taken, resample after 16 hours.

-OR-

B. At all accessible locations not exceeding 1,200 feet apart in the line downstream from where the pipe was filled with water. Allow main sit for 16 hours without water movement, then take first set of samples with a second set of samples after a 15-minute waiting period.

Samples shall be taken through the use of sample tap consisting of a corporation cock and copper tube or through other accessible appurtenances on the main. Samples shall be collected by a representative of the testing laboratory.

1. All bacteriological sampling and testing shall be conducted by a state certified laboratory. If the initial disinfection fails to produce satisfactory samples, disinfection shall be repeated until satisfactory samples have been obtained. After each group of samples is taken, the Contractor shall submit in writing to the Engineer a copy of the report stating the results of the tests.

K. Repairs: Cleaning, disinfecting, flushing, testing, or similar operational actions shall be in accordance with the most current standards issued by AWWA (AWWA C-601).

L. Discharge of chlorinated water

1. The contractor shall be responsible to handle, discharge, and dispose chlorinated water in compliance with all regulations, including the County's Municipal Separate Storm and Sanitary Sewer (MS4) Permit.
2. No potable water shall be discharged to the environment or the storm sewer system until complete dichlorination has been achieved.
3. Contractor shall be responsible to identify, implement, and monitor appropriate dichlorination methods which comply with all applicable regulations.
4. Contractor shall conduct testing on-site to confirm that chlorine has been removed from any water discharged to the environment or storm sewer.
5. Contractor shall take care to ensure that any discharge of dechlorinated water to the storm sewer or environment does not create any adverse impacts to the environment or infrastructure, such as erosion, or water volumes, temperatures, or velocities which adversely affect existing aquatic or terrestrial life in the receiving bodies.
6. Super chlorinated water which has been used to disinfect the system, or any water which exceeds the generally prevailing chlorine concentration in the system (measured as less than 4 mg/L), shall be discharged to the sanitary sewer system after submittal and approval of a discharge plan. The discharge plan shall be submitted in accordance with Section 01300, and shall document at a minimum:
   a. the receiving sanitary sewer manhole,
   b. the anticipated rate and duration of discharge,
   c. plans to prevent any hydraulic connection between wastewater and the water distribution system (backflow prevention or an adequate air-gap),
   d. listing of methods and equipment to be used,
   e. accommodations to maintain vehicular and pedestrian traffic during the operation.
7. Discharge of water to the sanitary sewer shall not exceed 200 gallons per minute.

8. Discharge of water to the sanitary sewer shall not occur without the Engineer present, and shall be conducted only after careful disinfection of all components connected to the water system.
9. At all times during discharge of water to the sanitary sewer system, the Contractor shall have personnel monitoring the discharge into the sewer to ensure there is no cross-connection and that there are no adverse impacts upon the water or sanitary sewer system.
10. If an adequate sanitary sewer facility is not available, the discharge plan may require use of a tanker truck to collect and dispose of the water in a sanitary sewer.

M. Unless otherwise directed, Contractors are expressly prohibited from operating any water valves or appurtenances. Contractors shall submit all requests for valve operations to the Project Officer at least 3 working days in advance of the required operation.

N. In the event of a water or sewer emergency, the Contractor shall immediately notify the County's Water Control Center at 703-228-5555 and the Project Officer

PART 4 - MEASUREMENT AND PAYMENT

4.1 Water Mains

Water mains for the various type, classes and sizes shown on the bid proposal shall be measured in linear feet along the pipe center line, regardless of depth, and shall include the length of fittings and valves. Payment shall include excavation, standard bedding, backfill, pipe, thrust restraint, fittings, laying of pipe, disinfection, flushing, erosion and sediment control, support of existing utilities, certification, testing, dewatering, restoration of roadways as shown in Standard M-6.1, all other restoration, trench maintenance, abandoning and/or removing existing mains and appurtenances as required and all other work necessary to prove a complete water main installation in compliance with the Construction Documents.

4.2 Valves

Valves shall be measured as each, by size and type. Payment shall include demolition. excavation, bedding, backfill, restoration, disinfection, certification, extension stems, thrust restraint, valve box and paved collar as required.

4.3 Fire Hydrants

Fire hydrants shall be measured as each. Payment shall include the hydrant and elbow, demolition, excavation, bedding, drainage gravel, thrust protection, backfill, restoration of roadways as shown in Standard M-6.1, all other restoration , disinfection, and certification.

4.4 Existing Fire Hydrants – Removed

Existing fire hydrants removed shall be measured as each. Payment shall include demolition, excavation, sheeting, shoring, backfilling, restoration of roadways as shown in Standard M-6.1, all other restoration, dewatering, removing, cleaning, capping hydrant branch, concrete thrust block and tie rods, joint restraint and testing of the cap.

4.5 Blow offs

Blow offs shall be measured as each by size. Payment shall include excavation, bedding, pipe, fittings, gate valve, adaptor, cap, meter box, frame and cover, service clamp, corporation stop, backfill, restoration of roadways as shown in Standard M-6.1, all other restoration and other incidental work to complete the installation.

4.6 Connections to Existing Water Mains

Connections of new water mains to existing water mains (except connections made with tapping sleeves and valves) shall be measured as each. Payment shall include test pits, excavation, backfill, restoration of roadways as shown in Standard M-6.1 and all other restoration, sleeves, dewatering, cutting, thrust restraint, and other work required to make the connection.

4.7 Tapping Sleeves and Valves

Tapping sleeves and valves shall be measured as each, by size. Payment shall include test pits, excavation, bedding, tapping, sleeve, valve, valve box, thrust restraint, backfill, restoration of roadways as shown in Standard M-6.1 and all other restoration .

4.8 Inserting Valves

Inserting valves shall be measured as each, by size. Payment shall include test pits, excavation, bedding, thrust restraint, installation, valve, valve box, backfill, restoration of roadways as shown in Standard M-6.1 and all other restoration .

4.9 Air Release Valves

Air release valves shall be measured as each. Payment shall include the entire setting, excavation, tapping, bedding, nipples, piping, fittings, corporation cock, gate valves, air release valve, manhole, manhole steps, frame and cover, backfill, restoration of roadways as shown in Standard M-6.1 and all other restoration .

4.10 Cutting and Capping Water Main to Remain in Service

Cutting and capping the water main to remain in service shall be measured as each, by size. Payment shall include excavation, cutting, capping, disinfection, restraints, backfill, restoration of roadways as shown in Standard M-6.1, and all other restoration

4.11 Water Service Connections

Water Service Connections shall be measured as each, by size. Payment shall include excavation, provision of all materials, backfill, restoration of roadways as shown in Standard M-6.1 and all other restoration. The County shall provide the water meter at no cost for service relocations.

PART 1 - GENERAL

1.1 Description of Work

A. Provide all plant, labor, material and equipment to furnish and construct bituminous concrete pavements in reasonably close conformity with the lines, grades, thicknesses and typical cross sections shown on the construction standards and as called for on the approved plans and specified herein.

B. The specifications referenced for each material shall fully apply and no deviations from said specification limits or quality shall be permitted unless specifically stated otherwise in this Section. The failure of any component of a product to comply with the referenced specifications shall constitute failure of the whole product.

1.2 Related Work Specified Elsewhere

Section 02201 - Earthwork for Roadways
Section 02601 - Bituminous Hiking, Biking and Jogging Trails
Section 02650 - Restoration of Roadway
Section 09900 - Protected Coatings (traffic marking material)

1.3 Applicable Specifications

Virginia Department of Transportation, Road and Bridge Specifications (VDOT)

1.4 Release

The Contractor shall obtain a release from the Engineer prior to commencing paving operations.

1.5 Applicable References

A. American Association of State Highway and Transportation Officials (AASHTO)
B. American Society for Testing and Materials (ASTM)

PART 2 – MATERIALS

2.1 Subbase

The subbase materials shall be in conformance with VDOT Section 208, gradation 21A, except as specified on approved construction plans.

2.2 Base Course

The base course shall be bituminous concrete consisting of course and fine aggregate combined with asphalt cement, resulting in a mixture of Type BM-25.0A in conformance with Section 211 of the VDOT Specifications.

2.3 Surface Course

The surface course shall be bituminous concrete consisting of crushed stone, crushed slag, or crushed gravel and the fine aggregate, slag or stone screenings, or combination thereof, combined with asphalt, cement, resulting in a mixture of Type SM-9.5A in conformance with Section 211 of VDOT Specifications.

The use of fine or coarse aggregate which tend to polish under traffic shall not be permitted in the top layer of surface courses except in driveways, entrances, scratch courses and other areas permitted elsewhere in these specifications.

2.4 Tack Coats

Tack coat shall be asphalt cement of viscosity grade CMS-2 or CRS-2 in conformance with Section 310 of VDOT Specifications.

2.5 Traffic Marking

Traffic marking shall be provided by the Contractor.

PART 3 - EXECUTION

3.1 Furnish for test and analysis by an independent testing Agency, representative samples of the materials to be used in the work. Samples and testing shall be in accordance with VDOT Specification 211.06.

3.2 Grades shall be established by the Contractor. Thoroughly prepare and compact the sub grade as specified in Section 02201 - Earthwork for Roadways. Do not prime the sub grade.

3.3 Lay the subbase to the compacted thickness as shown on the Construction Standards and defined on the Contract Drawings in conformance with Section 308 of VDOT Specifications.

3.4 Lay the asphalt pavement to the compacted thickness as shown on the Construction Standards and defined on the Contract Drawings in conformance with Section 315 of VDOT Specifications.

3.5 Place the tack coat in conformance with Section 310 of VDOT Specifications.

3.6 The surface tolerance of the completed work shall be as specified in Section 315.07(a) of VDOT Specifications.

3.7 Maintain pavement placed under this Contract in a safe and satisfactory condition, and repair depressions and holes with material equal to that specified.

PART 4 - MEASUREMENT AND PAYMENT

4.1 Bituminous pavement shall be paid per the plan dimensions as verified in the field by the Project Officer or his designee and shall be based on 120 pounds per sq. yd. per inch depth. Payment shall be in tons of bituminous concrete per category of street payment and shall include demolition, excavation, the necessary preparation of the sub grade surface, tack coats and bituminous concrete materials.

4.2 Subbase shall be measured to the width and depths shown on the approved plans as verified in the field by the Project Officer or his designee. Payment shall be in cubic yards of material.

PART 1 - GENERAL

1.1 Description of Work

A. Provide all plant, labor, material and equipment to furnish and construct the bituminous hiking, biking and jogging trails in reasonably close conformity with the lines, grades, thicknesses and typical cross sections shown on the construction standards and as called for on the approved plans and specified herein.

B. The specifications referenced for each material shall fully apply and no deviations from said specification limits or quality shall be permitted unless specifically stated otherwise in this Section. The failure of any component of a product to comply with the referenced specifications shall constitute failure of the whole product.

1.2 Related Work Specified Elsewhere

Section 02600 - Bituminous Roadway Pavements

1.3 Applicable Specifications

Virginia Department of Transportation, Road and Bridge Specifications (VDOT)

1.4 Applicable References

A. American Association of State Highway and Transportation Officials - (AASHTO)

B. American Society for Testing and Materials (ASTM)

PART 2 - MATERIALS

2.1 Aggregate Base

The aggregate base shall be 6 inches of crusher run aggregate of size 25 or 26 and in conformance with Section 205 of the VDOT Specifications, or 6 inches of course aggregate of size 57 or 68 in conformance with Section 203 of the VDOT Specifications.

2.2 Surface Course

The surface course shall be 4-inch in thickness and type SM-9.5A as specified for the surface course in Section 02600.

PART 3 - EXECUTION

3.1 Place and compact bituminous concrete walks in conformance with Section 315.04 of the VDOT Specifications.

PART 4 - MEASUREMENT AND PAVEMENT

4.1 Bituminous concrete pavement shall be based on 120 pounds per sq. yd. per inch of depth and shall be paid per plan dimensions as verified in the field by the Project Officer or his designee.. Payment shall be in tons of bituminous concrete installed and shall include demolition, excavation, the necessary preparation of the sub grade surface, tack coats and bituminous concrete materials.

4.2 Aggregate base shall be measured to the actual dimensions constructed. Payment shall be in cubic yards

PART 1 - GENERAL

1.1 Description of Work

Provide all labor, plant, materials and equipment to lay all concrete walks and driveway entrance as detailed in the Construction Standards and as called for on the approved plans.

1.2 Related Work Specified Elsewhere

Section 03100 - Concrete Formwork, Reinforcement and Materials

1.3 Applicable Specifications

A. American Society for Testing and Materials (ASTM)

B. Virginia Department of Transportation, Road and Bridge Specifications (VDOT)

PART 2 - MATERIALS

2.1 Aggregate Base

The aggregate base shall be aggregate conforming to VDOT Section 205 gradation 25 or 26 or course aggregate of size 68 in conformance with Section 203 of the VDOT Specifications.

2.2 Concrete

Concrete shall be Portland Cement air-entrained Class A3 in conformance with Section 03100.

2.3 Joint Filler

Joint filler shall be 1/2-inch preformed asphalt expansion joint material conforming to ASTM D994 or ASTM D1751.

PART 3 - EXECUTION

3.1 Concrete testing shall be conducted in conformance with Section 03100.

3.2 Grades shall be established by the Contractor. Thoroughly prepare and compact the sub grade as specified in Section 02201.

3.3 Place the aggregate base in conformance with Section 309 of the VDOT Specifications.

3.4 Joints shall be constructed at intervals of 40 feet, except for closures, but a slab shall not be less than 6 feet in length. Separate slabs by transverse premolded expansion joint filler for the full width of the slab, extending from the bottom of the slab to within one-quarter (1/4) inch of its top surface. Divide the slab between expansion joints into blocks 5-feet in length by scoring transversely. Where slabs are more than 7-feet in width, they shall be scored longitudinally to secure uniform blocks approximately square. Extend traverse and longitudinal scoring to at least 1/3 of the depth of the concrete slab. Scoring of transverse and longitudinal joints may be done with trowels, finishing and edging tools or by other means approved by the Engineer.

3.5 Where sidewalks are constructed adjacent to permanent structures or other rigid construction on one side and curb on the other, extend an expansion joint of premolded material only along back at curb and place for the full depth of the slab. Place a premolded expansion joint between the sidewalk and adjacent curb at all crosswalks both public and private. Fasten premolded expansion joint filler to prevent displacement.

3.6 Where sidewalk is constructed in conjunction with adjacent curb, the expansion joints in the curb and sidewalk shall coincide. Where such construction is adjacent to existing curb, the expansion joints shall, if practicable, coincide. Prior to placing concrete around any permanent structure, place premolded expansion joint material around such structure for the full depth of the sidewalk.

3.7 Where existing structures, such as light standards, poles, fire hydrants, etc., are within the limits of the sidewalk area, place premolded expansion joint around the structure for the full depth of the concrete.

3.8 Place sidewalk stress columns 6 inches in diameter and a minimum depth of 12 inches below the bottom of the sidewalk at locations shown in Construction Standards unless otherwise specified by the Engineer. The holes for the columns may be dug with a post hole digger or other approved means. The concrete must be the same type used in the sidewalk and placed at the same time. No separate payment shall be made for excavation or concrete used in these columns, but shall be included in the price bid for the sidewalk.

3.9 Provide concrete forms, and pour the concrete in conformance with Section 504 of the VDOT Specifications.

3.10 Finish concrete walks and driveways as specified in Section 404.19 of the VDOT Specifications.

3.11 The surface tolerance of the completed work shall be as specified in Section 316 of the VDOT Specifications.

PART 4 - MEASUREMENT AND PAYMENT

4.1 Concrete sidewalks shall be paid by the square yard per the plan dimensions as verified in the field by the Project Officer or his designee. Payment shall include the cost of stress columns.

4.2 Concrete driveway entrances shall be paid by the square yard of driveway entrance per the plan dimensions as verified in the field by the Project Officer or his designee. Payment shall be in square yards for each type of driveway entrance.

4.3 Aggregate base shall be paid per the plan dimensions as verified in the field by the Project Officer or his designee. Payment shall be in cubic yards of material

4.4 Demolition, excavation and restoration shall be considered incidental to the work and therefore, no separate payment shall be made for demolition, excavation or restoration.

PART 1 - GENERAL

1.1 Description of Work

Provide all labor, plant, material and equipment to lay interlocking concrete or brick pavers to line and grade as detailed in the Construction Standards and as called for on the approved plans.

1.2 Relate Work Specified Elsewhere

Section 02611 - Concrete Walks and Concrete Driveway Entrances
Section 02613 - Paver Crosswalk
Section 03100 - Concrete Formwork, Reinforcement and Materials
Section 04100 - Mortar and Grout

1.3 Applicable Specifications

A. American Association of State Highways and Transportation Officials (AASHTO)
B. American Society for Testing and Materials (ASTM)
C. Virginia Department of Transportation, Road and Bridge Specifications (VDOT)
D. Concrete Paver Institute (CPI), a division of the National Concrete Masonry Association (NCMA)

1.4 Quality Assurance

A. Installation shall be performed by an installer with at least one year experience in placing interlocking concrete and brick pavers.

1.5 Submittals

A. Submit shop or product drawings and product data.
B. Submit samples of paver units to indicate color and shape selection.
C. Submit sieve analysis for grading of bedding and joint sand.
D. Submit test results for compliance of paver unit requirements to ASTM C936 from an independent testing laboratory.

1.6 Environmental Conditions

A. Do not install sand or pavers during rain or snowfall.
B. Do not use frozen sand.

PART 2 - MATERIALS

2.1 Interlocking concrete pavers shall be manufactured for compliance of paving unit requirements to ASTM C936, as indicated below. Concrete pavers shall be 6 centimeters thick for sidewalk application and 8 centimeters thick for driveways.

A. Minimum average compressive strength of 8000 psi (55 MPa).

B. Maximum absorption of 5% when tested in accordance with ASTM C140.

C. Resistance of 50 freeze-thaw cycles, when tested in accordance with ASTM C67.

2.2 Bedding and joint sand shall be clean, non-plastic, free from deleterious or foreign matter. The sand shall be natural or manufactured from crushed rock. Grading of samples shall be done according to ASTM C136. The particles shall be sharp and conform to the grading requirements of ASTM C33 as shown in Table below.

Table 1

Grading requirements for Bedding and Joint sand

Sieve Size	Percent Passing
3/8 in. (9.50mm)	100
No. 4 (4.75mm)	95 to 100
No. 8 (2.36mm)	80 to 100
No. 16 (1.18mm)	50 to 85
No. 30 (600 um)	25 to 60
No. 50 (300 um)	10 to 30
No. 100 (150 um)	2 to 10

2.3 Brick pavers shall be manufactured according to ASTM C-902. Mortar for brick pavers and setting base shall be Type M as specified in Section 04100.

2.4 Aggregate used for compacted base shall be well graded crushed limestone or crushed stone specified as VDOT grade 21A, 25 or 26.

2.5 PVC edge restraint shall be Pave Tech edging with 12-inch x 3/8-inch diameter galvanized steel pins @ 1' on center or approved equal.

PART 3 - EXECUTION

3.1 Base requirements shall be a minimum of 6-inch of compacted aggregate for sidewalks when interlocking concrete pavers are used or 4-inch concrete base for

brick pavers and 6-inch concrete slab for residential driveway and 9-inch for commercial driveway conditions.

3.2 Aggregate base materials shall be compacted to a density of 95 percent of Modified Proctor ensity with a tolerance of ±1/4-inch to the following grades.

6 cm concrete pavers - 3 1/2-inch below finish grade of pavers
8 cm concrete pavers - 4 1/4-inch below finish grade of pavers
brick pavers - N/A

3.3 The sand leveling course for concrete pavers shall be screeded loose to a thickness of 1-inch to 1-1/2-inch. The exact thickness shall be determined at the job site. Care shall be taken to ensure the leveling base is loose and is not disturbed.

3.4 The leveling base shall be treated with a soil stabilizer to prohibit the growth of grass.

3.5 The concrete pavers shall be installed hand tight being careful not to disturb the laying bed. The use of string line may be required to keep straight lines. A motor-driven masonry saw shall be used to cut edges where straight pavers can not be used. Hammer cutting is not acceptable. No cut segment shall be smaller than one third of a paver unit measured in any direction.

3.6 Concrete pavers shall then be vibrated into leveling base with a vibratory plate capable of 3,500 to 5,000 pound compaction force. This must be done prior to any rain.

3.7 Joints shall be filled after vibration using dry sand. Brush and vibrate sand into joints until they are completely filled, then remove surplus sand.

3.8 All work to within three feet of the laying face must be left fully compacted with sandfilled joints at the completion of each day. Cover the remaining uncompacted edge of the laying face and sand with waterproof covering.

3.9 Brick pavers shall be laid into a mortar setting bed and leveled. All joints shall be filled completely with mortar.

3.10 The color of the concrete or brick pavers shall be as indicated on approved plans. Pavers shall be selected from four or more cubes to blend color and texture variations. The laying pattern shall be herringbone unless specified otherwise.

3.11 Do not finish concrete base as provided for in Section 02611.

3.12 Edge restraints shall be 1/4-inch below the top of the edge pavers to minimize the potential for tripping and to allow for minor settlement of the pavers and to assure drainage of pavement runoff.

3.13 The final surface elevations shall not deviate more than 3/8-inch under a 10 foot long straight edge.

3.14 The surface elevation of pavers shall be 1/8 to 1/4 inch above adjacent drainage inlets, concrete collars or channels.

PART 4 - MEASUREMENT AND PAYMENT

4.1 Interlocking concrete and brick pavers for sidewalk application shall be paid in square yards per the plan dimensions as verified in the field by the Project Officer or his designee. Payment shall be for each type of masonry walk installed, complete in place and shall include the necessary demolition, excavation, restoration, preparation of the sub grade surface, aggregate base, sand leveling base, filter fabric and edge restraints, if required.

PART 1 - GENERAL

1.1 Description of Work

Provide all labor, materials, equipment and services necessary to complete the crosswalk as shown on the drawings and specified herein.

1.2 Related Work Specified Elsewhere

Section 02611 - Concrete Walks & Concrete Driveway Entrance
Section 02612 - Interlocking Concrete and Brick Pavers
Section 03100 - Concrete, Formwork, Reinforcement and Materials
Section 04100 - Mortar and Grout

1.3 Applicable Specifications

A. American Society for Testing and Materials (ASTM)

B. Virginia Department of Transportation, Road and Bridge Specifications (VDOT)

C. Concrete Paver Institute (CPI), a division of the National Concrete Masonry Association (NCMA)

1.4 Submittals

A. Samples: Submit the following samples:
1. Five concrete units of masonry showing full range of color and texture.

B. Certificates of Conformance: Submit certificates from the manufacturer attesting that the concrete pavers meet the requirements specified.
1. Concrete Pavers
2. Mortar Coloring
3.

1.5 Quality Assurance

A. Handling and Storage
1. Handle, sort, and protect masonry units in a manner to avoid chipping, breakage or contact with the soil. Keep ties, and joint reinforcement free of rust. Steel reinforcing bars shall be free of loose scale and rust. Reject rusted steel reinforcing, ties and joint reinforcement. Deliver cement in unbroken bags, barrels, or other sealed containers, plainly marked and labeled with the manufacturer's names and brands. Store cementitious materials in dry, weather tight sheds or enclosures or under watertight tarpaulins. Sort and handle cement in a manner which

shall prevent the inclusion of foreign materials and damage by water or dampness.

B. Environmental Conditions

1. Hot Weather Installation: Protect masonry when the ambient air temperature is more than 99 degrees F in the shade, and the relative humidity is less than 50 percent from direct exposure to wind and sun for 48 hours after installation.
2. Cold Weather Construction: Do not lay masonry when the air temperature is below 40 degrees F and falling, or when it appears that air temperature shall drop to 40 degrees F or below before the mortar has set. Work shall not be permitted with or on frozen materials.
3. Do not install sand or pavers during heavy rain.

PART 2 - MATERIALS

2.1 Mortar

A. General Requirements: Consult paver installers locally to determine the best suited for the project. Hard, naturally occurring sands with symmetrical particles are recommended for pavements subject to vehicular traffic.

B. Grading: Bedding and joint sands shall be graded per ASTM-C33 shown in Table 1. below.

Table 1

Grading requirements for Bedding and/or Joint sand

Sieve Size	Percent Passing
3/8 in. (9.50mm)	100
No. 4 (4.75mm)	95 to 100
No. 8 (2.36mm)	80 to 100
No. 16 (1.18mm)	50 to 85
No. 30 (600 um)	25 to 60
No. 50 (300 um)	10 to 30
No. 100 (150 um)	2 to 10

C. Bedding and joint sand shall be natural or manufactured from crushed rock, and shall be clean, non-plastic, free from deleterious or foreign matter. Particles shall be neither flat nor elongated.

D. Limestone screenings and stone dust are not acceptable.

E. Sieve analysis on samples shall be graded per ASTI-C236.

2.2 Concrete Pavers

Concrete pavers shall be 8 centimeters thick for crosswalk application and shall be as specified in Section 02612. The color and laying pattern shall match the adjacent sidewalk as indicated on the drawings.

2.3 Concrete Base Slab

The concrete base slab, slab reinforcing and expansion joints shall be as specified in Section 03100 of these specifications.

2.4 Aggregate Subbase

The aggregate subbase shall be gradation 21A conforming to VDOT Specifications, Section 208.

2.5 Geotextile

Shall be woven of polyester or polypropylene fibers, with a permeability rating 10 times greater than that of soil on which paving is founded and an apparent opening size (AOS), small enough to prevent passage of fines from setting bed into soil sub grade or graded aggregate base.

PART 3 - EXECUTION

3.1 Examine the areas and conditions where masonry is to be installed and notify the Engineer of conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected by the Contractor in a manner acceptable to the Engineer.

3.2 Lay the aggregate subbase to the compacted thickness shown on the drawings and in conformance with Section 308 of the VDOT Specifications.

3.3 The concrete base slab shall be installed in accordance with the drawings, details and Section 03100 of these specifications.

3.4 All paving adjoining the crosswalk shall be complete before the sand setting bed is laid. This includes all patching of existing adjoining pavement. Steel rollers used to compact the pavement shall not run over the pavers.

3.5 All pavers shall be free of foreign materials before installation. Do not use concrete pavers with excessive chips, cracks, voids stains or other defects that might be visible in the finished work. allowed on the bottom of the pavers.

3.6 The base concrete slab shall be cleaned of all asphaltic concrete components, dust, oil, or any other material. The finished surface of the base to receive the bedding sand shall be uniform and even, and shall not deviate by more than +0 and -1/2 inch (13mm) over 10' (3m) when measured in any direction.

3.7 Place sand for setting bed and screed to thickness of 1 inch to 1 1/2 inch (25 to 40 mm), taking care that moisture content remains constant and the density if loose and constant until all pavers are set and compacted.

3.8 Lay setting bed so that elevation of top surface of pavers shall be 1/8 inch (3mm) min to 1/4 inch (6mm) max. above adjacent drainage inlets, concrete collars, channels, or other pavements after compaction.

3.9 Lay unit pavers in joint pattern shown on the drawings.

3.10 Set concrete pavers with a minimum joint width of 1/16 inch (1.5mm) and a maximum of 3/16 inch (5mm), being careful no to disturb leveling base. If pavers have spacer bars, place pavers hand tight against spacer bars. Concrete pavers with spacer bars on sides of each unit are recommended when installation is performed with mechanical equipment. Use string lines to deep straight lines. Select units from 4 or more cubes to blend color and texture variations. Fill gaps at edge restraints that exceed 3/8 inch (10mm) with pieces cut to fit from full size unit pavers.

3.11 Vibrate concrete parers into leveling course with a low amplitude plate vibrator capable of a 3,000 to 5,000 pound (13 to 22 KN) compaction force.

3.12 Vibrate after edge pavers are installed, and there is a completed, restrained surface: or before surface is exposed to rain. Vibrate installed concrete pavers within 3 feet (1m) of the laying face and cover with sand BEFORE ENDING EACH DAY'S WORK.

3.13 Spread dry sand and fill joints immediately after vibrating pavers into leveling course. Brush and vibrate sand into joints until they are completely filled, then remove surplus sand.

3.14 Do not allow traffic on installed concrete pacers until sand has been vibrated into joints.

3.15 Final surface elevations shall not deviate more than 3/8 inch (10 mm) under a 10 foot (3m) long straightedge.

PART 4 - MEASUREMENT AND PAYMENT

Paver crosswalks shall be paid per the plan dimensions as verified in the field by the Project Officer or his designee. Payment shall be in square yards for the type paver crosswalk installed, including the necessary preparation of sub grade, restoration of adjacent pavement, demolition, excavation, aggregate subbase, concrete base and incidentals necessary for a complete installation.

PART 1 – GENERAL

1.1 Description of the Work

Provide all necessary labor, materials and equipment to provide, fabricate, and install the permanent signs, posts, and connections as shown on plans, details, and these specifications. All work under this section is subject to the Special and General Conditions and Instruction to Bidders which form a part of these specifications and to the current editions of the Arlington County Construction Standards and Specifications Manual and Virginia Department of Transportation Road and Bridge Specifications (VDOT). The Contractor shall be responsible for and governed by all the requirements thereunder.

PART 2 – MATERIALS

2.1 All traffic control signage shall conform to the latest edition of the Manual on Uniform Traffic Control Devices (MUTCD).

2.2 Sign anchors bases, or sleeve bases shall meet current AASHTO, FHWA, and VDOT requirements for breakaway and yielding and shall be galvanized or stainless steel.

2.3 Sign posts set in earth shall be U-type rolled rail post (2 lbs/foot) with full length punching of 3/8-inch diameter holes spaced 1 inch on center starting 1 inch from each end. Posts shall be re-rolled steel or an equivalent steel. Posts shall conform to the mechanical requirements of ASTM A-499-81, Grade 60 (Hot-Rolled Carbon Steel Bars and Shapes Re-Rolled from Rail Steel). All posts are to be hot dipped zinc galvanized.

2.4 The use of other than U-type posts at any location requires approval from Arlington County.

2.5 Where square posts are permitted the following standards must be met.

2.5.1 Steel posts shall conform to ASTM A570, Grade 50 for Hot-Rolled Carbon Sheet Steel.

2.5.2 Post cross section shall be square formed from 14 or 12-gauge steel and shall be welded at the corner.

2.5.3 Posts shall be straight and have a smooth finish.

2.6 Banding used with saddles and buckles to fasten sign panels to streetlight or signal poles shall be stainless steel with a minimum width of ¾ inch.

2.7 Saddles shall be stainless steel with stainless steel bolts.

2.8 Buckles shall be stainless steel with a minimum width of ¾ inch.\

2.9 Fasteners shall be 3/8" O.D. galvanized bolts with nylon washer for the sign front and galvanized hex nut and washer for the sign back.

2.10 Sign surface image shall conform to applicable portions of Sections 247 and 701 of the VDOT Road and Bridge Specifications. The sign colors and backgrounds shall conform to the details. Colors and shop drawings of signs shall be approved by the Owner prior to fabrication. Sign shall be drilled for bolts prior to painting

2.11 Post footings shall be Class A-3 concrete per Section 03100 of the Arlington County Construction Standards and Specifications Manual

PART 3 – EXECUTION

3.1. The signs shall be installed in locations as shown on the plans.

3.2. Posts located in earth shall be anchored or driven to a minimum depth of 36 inches.

3.3. Driving caps shall be used when driving posts following the manufacturer's instructions.

3.4. Posts located in concrete sidewalk or concrete medians A 12-inch minimum diameter cylindrical excavation to depth shown on detail shall be made to install the sign post. The post shall extend 36" (thirty-six inches) minimum below finished grade.

3.5. Concrete for footings shall be poured in accordance with the requirements outlined in the Section 03100 of the Arlington County Construction Standards and Specifications Manual.

3.6. The sign shall be centered on the post and fastened with the specified bolts. The lower edge of the signs shall be to the dimension above finished grade as shown on the details for each sign type.

PART 4 – MEASUREMENT AND PAYMENT

4.1 New Traffic Sign

New Traffic Signs as shown on the Drawings and as specified herein shall be measured in units of each, complete-in-place. Payment shall be at the contract unit price per each, and shall include the furnishing of all signs, posts, concrete, fastening materials, and other material required to provide a complete sign installation, as well as all other work incidental to providing a complete installed sign.

4.2 Relocate Traffic Sign

Relocate Traffic Sign as shown on the Drawings and as specified herein shall be measured in units of each. The Project Officer may allow the Contractor to reuse the

sign, post, or related hardware for re-installation at the new location, subject to approval by the Project Officer. If the Project Officer determines that the sign, post, or hardware is damaged or does not meet this specification; and that the reinstallation of any or all of the materials shall not result in a satisfactory traffic sign installation the Contractor shall furnish and install new materials as required to provide a complete-in-place traffic sign.

PART 1 - GENERAL

1.1 Description of Work

Provide the necessary plant, labor, materials and equipment to restore and maintain the various street and driveway surfaces of all types, pavement and driveway bases, curbs, curb and gutter, and sidewalks disturbed, damaged or demolished during the performance of the work.

1.2 Related Work Specified Elsewhere

Section 02600 - Bituminous Roadway Pavements
Section 02601 - Bituminous Hiking, Biking and Jogging Trails
Section 02611 - Concrete Walks and Concrete Driveway Entrance
Section 02612 - Interlocking Concrete and Brick Pavers
Section 02750 - Curb and Gutters
Section 03100 - Concrete Formwork, Reinforcement and Materials

1.2 Applicable Specifications

A. American Society for Testing and Materials (ASTM)
B. Virginia Department of Transportation, Road and Bridge Specifications (VDOT)

1.4 Applicable Reference

American Association of State Highway and Transportation Officials (AASHTO)

1.5 Permits

Before performing any work, secure the necessary permits to work within the County or State right of way and easements when surface materials shall be disturbed or demolished.

PART 2 - MATERIALS

2.1 The quality of materials used in the restoration of existing pavements and driveways shall produce a street surface equal to or better than the condition before the work began.

2.2 Concrete shall be Class A3 air-entrained Portland cement type as specified in Section 03100.

2.3 The base and surface courses shall be BM-25.0A and SM-9.5A respectively as specified in Section 02600.

2.4 Crusher run aggregate shall be size 25 in conformance with Section 206 of the VDOT Specifications.

2.5 Joint filler shall be 1/2-inch preformed asphalt expansion joint material conforming at ASTM 1751.

2.6 Asphalt for a temporary patch shall be BM-25.0A as specified in Section 02600.

PART 3 - EXECUTION

3.1 Where trenches have been opened in any roadway or street that is a part of the State of Virginia highway system, restore surfaces in accordance with the requirements of VDOT. All other restoration shall be done in accordance with the Contract Drawings, these specifications, and the Construction Standards.

3.2 Excavation in the pavement area shall require that pavement surfaces be saw-cut to provide a straight and smooth edge. Cut out pavement 24-inches wider than the trench width or excavation opening as shown on Construction Standard M-6.0.

3.3 Upon completion of installation of utility and backfill, fill the top 18-inches of the trench with crusher run and temporary asphalt patch until such time that the permanent pavement patch shall be constructed.

3.4 Complete the pavement restoration for the various types of streets in conformance with Construction Standard M-6.0 and Section 02600.

3.5 Concrete curb and gutter, and sidewalks, shall be restored as required to match existing construction. Replace damaged sections with complete new sections or squares; patching of damaged sections shall not be permitted.

3.6 Maintain restored sections and surfaces as part of the Contract requirements for a period of one year following the date of final acceptance.

3.7 When a manhole top requires adjustment to an elevation one inch or more above the existing pavement grade and is exposed to traffic before final paving is completed, a temporary ramp shall be constructed by feathering bituminous concrete for 360 degrees around the manhole.

A taper slope of not less than two feet per one inch shall be used. During the paving operation but prior to the placement of the topping course the bituminous concrete taper shall be removed from around the manhole to a minimum depth of one inch below the top of manhole.

PART 4 - MEASUREMENT AND PAYMENT

4.1 Restoration of, sidewalks, curb and gutter, entrances, medians and all other public improvements disturbed as a part of any contracted work shall be considered incidental to the Contact work and therefore no separate payment shall be made for any restoration items unless specifically stipulated otherwise in the Contract or otherwise directed by the Project Officer in writing.

PART 1 - GENERAL

1.1 Description of Work

Provide all plant, labor, materials and equipment to install the concrete curbs and combination concrete curb and gutters as called for on the approved plans, as detailed on the Construction Standards, and as specified herein.

1.2 Related Work Specified Elsewhere

Section 02611 - Concrete Walks and Concrete Driveway Entrance
Section 03100 - Concrete Formwork, Reinforcement and Materials

1.3 Applicable Specification

A. American Association of State Highway and Transportation Officials (AASHTO)

B. American Society for Testing and Materials (ASTM)

C. Virginia Department of Transportation, Road and Bridge Specifications (VDOT)

PART 2 - MATERIALS

2.1 Concrete

Concrete shall be Portland cement class A3 in conformance with Section 03100.

2.2 Joint Filler

Joint filler shall be 1/2-inch performed asphalt expansion joint material conforming to ASTM D994 or ASTM D1751.

2.3 Subbase

The subbase materials shall be in conformance with VDOT Section 208, gradation size 21A.

PART 3 - EXCAVATION

3.1 Construct the sub grade to the required elevation below the finished surface of the gutter in accordance with dimensions and design as shown on Construction Standards. Remove all soft and unsuitable material and replace with subbase material, which shall be compacted to 95% density in accordance with AASHTO T-

99 and finished to a smooth surface. Moisten the subbase prior to placing the concrete.

3.2 Construct forms of wood or metal conforming to VDOT Section 403.03.

3.3 Prior to placing concrete, check the line and grade for accuracy and fasten the face forms of the curb to the gutter forms. Spade the concrete and tamp sufficiently to bring the mortar to the surface, after which finish with a magnesium float. Construction shall be in sections of uniform lengths, providing transverse joints at approximately 10-feet intervals and when the time elapsing between placements exceeds 45 minutes. No section shall be less than 6 feet in length. Separate sections by plate steel templates set perpendicular to the grade and center line of the unit specified. The templates shall be 1/8-inch in thickness and shall have a width and depth equal to the unit cross-section.
Leave these templates in place until the concrete has set sufficiently to hold its shape.

3.4 Form expansion joints at intervals of 100 feet or less. When the curb and gutter is constructed adjacent to rigid pavements, the location and width of expansion joints shall coincide with those in the pavement, where practicable. Where stationary structures, such as catch basins and drop inlets, are within the limits of the curb and gutter, place an expansion joint between the structure and the curb and gutter. Place expansion joints at all returns.

3.5 Screed the face and top of curb and surface of gutter smooth and round the edges to a radius as shown on the Construction Standards.

3.6 As soon as the concrete has attained sufficient set, remove the face forms of the curb. The exposed surfaces shall be screeded with a straight edge and finished with a steel trowel. Remove all trowel marks with a brush wet with clear water. Do not use mortar in finishing.

3.7 The finished surface of curb and gutter shall be true to line and grade with an allowable tolerance as specified in Section 316.05 of the VDOT Specifications.

3.8 After the concrete has set in conformance with Section 03100, fill the spaces on both sides of gutter or the back side of curb to the required elevation with suitable material and compact to 95 percent density in accordance with AASHTO T-99 in layers of not more than 6-inches.

PART 4 - MEASUREMENT AND PAYMENT

4.1 Measurement shall be in linear feet per the plan dimensions as verified in the field by the Project Officer or his designee. Payment shall be at the contract unit price per type of curb section..

4.2 Payments for Subbase material shall be made in cubic yards of material per the plan dimensions as verified in the field by the Project Officer or his designee.

4.3 Demolition, excavation and restoration shall be considered incidental to the work and therefore, no separate payment shall be made for demolition, excavation or restoration.

PART 1 – GENERAL

1.8 Description of The Work

Provide all labor, materials, tools, equipment, transportation, supplies, and incidentals to establish the location of pavement markings, install pavement markings, and reflectorized material on specified pavements in accordance with these specifications, the MUTCD, and as directed by the Engineer.

This work shall also include furnishing and installing colored coating for bicycle lanes.

PART 2 - MATERIALS

2.1 Pavement Markings

Pavement Markings shall conform to the requirements of Section 246 of the VDOT Road and Bridge Specifications.

2.2 Glass Beads

Glass Beads shall conform to the requirements of section 234 of the VDOT Road and Bridge Specifications.

2.2 Colored Asphalt Coating

Colored asphalt coating shall be StreetBond CL by Quest Construction Products or County approved equal. Color shall be Emerald Green. Verify color with County prior to ordering.

PART 3 – EXECUTION

1.1 Timing of Installation

The Contractor shall have a certified Pavement Marking Technician present during pavement marking operations.

Pavement markings shall be installed on new roadways prior to opening the roadway to traffic. Pavement marking installation shall be completed within the time limits herein on roadways where the pavement markings have been removed or obscured and the roadway is open to traffic unless otherwise directed by the Engineer. Installation of Type B, Class VI, pavement markings on asphalt roadways are not applicable to these requirements if they are inlaid with the last pass of the asphalt roller or directly after the asphalt roller using a separate roller. Installation of edge lines on roadways where the existing pavement markings have been removed or

obscured are also required within these time limits unless otherwise indicated by the Engineer. Exceptions to the below time limits shall be granted only for weather restrictions, and installation of epoxy resin pavement markings on new pavement shall not commence until after 24 hours of final surface placement.

Pavement marking installation on roads having traffic volumes of 10,000 ADT or more shall be completed within 24 hours after the end of the workday where the pavement markings were removed or obscured.

Pavement marking installation on roads having traffic volumes between 3,000 and 10,000 ADT shall be completed within 48 hours after the end of the workday where the pavement markings were removed or obscured.

Pavement marking installation on roads having traffic volumes of less than 3,000 ADT shall be completed within 72 hours after the end of the workday where the pavement markings were removed or obscured.

1.2 Provision for Temporary Markings

If the Contractor shall not have pavement markings installed within the time limits specified, the Contractor shall install Type D construction pavement markings within the same time limits and maintain such until the final pavement markings can be installed. The cost of installing, maintaining, and removing the Type D construction pavement markings shall be borne by the Contractor at no cost to the County.

When establishing the location of pavement markings, the Contractor may mark the locations on the roadway by installing premarkings.

Premarkings shall be accomplished using Type D (removable, any class) tape, chalk, or lumber crayons except special pavement markings such as stop lines, crosswalks, messages, hatching, etc., shall be made using chalk or lumber crayons. Premarkings shall be of the same general color as the pavement markings being premarked. When tape is used as premarking, premarking shall consist of 4-inch by 4-inch-maximum squares or 4-inch-maximum diameter circles spaced at 100-foot-minimum intervals in tangent sections and 50-foot-minimum intervals in curved sections. At locations where the pavement marking shall switch colors, e.g., gore marking, the ends of the markings may be premarked regardless of the spacing. When chalk or lumber crayon is used as premarking, the entire length of the pavement marking may be premarked.

Premarkings shall be installed whereby their installation shall not affect the adhesion of the pavement markings. When Type D tape is used as the premarking and the lateral location of such premarkings to the final pavement markings exceeds 6 inches, the premarkings shall be removed at no cost to the County.

1.3 Pavement Markings

Pavement markings shall be white or yellow markings as required by the MUTCD for the specific location or as specified by the Engineer and shall be installed in accordance with the manufacturer's recommendations and approved by the Engineer. The Contractor shall furnish a copy of the manufacturer's installation recommendations to the Engineer.

1.4 Pavement Line Markings

Pavement line markings shall consist of stop lines, crosswalks, and solid or skip lines used for, but not limited to, dividing lanes, marking edges, channelizing, outlining and marking safety zones around objects, and forming islands and parking lot stalls. Crosswalks and stop lines shall be installed using Type B, Class I or IV, markings. Solid lines or skip lines shall be installed using Type A or Type B markings as specified.

1.5 Pavement Message Markings

Pavement message markings shall be installed using Type B, Class I, IV, or VI, markings and shall include, but not be limited to, school zone markings, railroad crossing markings, disabled parking symbols, elongated arrows, word messages, etc.

The word SCHOOL shall be formed with characters that are 10 feet in height where permitted by the normal roadway width. School zone markings shall extend transversely across both lanes of two-lane roadways and across two or more approach lanes of roadways of three or more lanes.

Disabled parking symbols shall be 41 inches in height, 36 inches in width, and shall use a 4-inch stroke width for the lines.

1.6 Application

The Contractor shall protect the public from damage attributable to pavement marking operations. The Contractor shall be responsible for the complete preparation of the pavement surface, including, but not limited to, removing dust, dirt, loose particles, oily residues, curing compounds, concrete laitance, residues from eradication, and other foreign matter immediately prior to installing pavement markings.

The pavement surface shall be dry at the time of installation. Marking material shall not be applied within 24 hours following rain or other inclement weather.

Liquid markings shall be applied so as to prevent splattering and overspray and shall be protected from traffic until track free by the use of guarding or warning devices as necessary. If a vehicle crosses a marking and tracks it or if splattering or overspray occurs, the affected marking and resultant tracking shall be removed and new markings applied at the Contractor’s expense.

Equipment shall also be thoroughly cleaned between changes in colors of materials. Pavement markings shall have clean and well-defined edges without running or deformation; shall be uniform, free of waviness; shall be straight on tangent alignment; and shall be on a true arc on curved alignment.

1.7 Tolerance

The widths of pavement markings shall not deviate more than 1/4 inch on tangent nor more than 1/2 inch on curves from the required width. The length of the gap and the length of the individual stripes that form skip lines shall not deviate more than two inches. The length of the gap and individual skip line shall be of such uniformity throughout the entire length of each that a normal striping machine shall be able to repeat the pattern and superimpose additional striping upon the existing marking.

1.8 Glass Beads

Glass beads shall be applied at the rate specified herein and shall be evenly distributed over the entire surface of the marking. Beads shall be applied to the surface of liquid markings by a bead dispenser attached to the applicator that shall dispense beads simultaneously on and in the just-applied marking. The bead dispenser shall be equipped with a cut-off control synchronized with the cut off of the applied marking material so that the beads are applied totally to the completed line.

Beads shall be applied while the liquid marking is still fluid. Approximately 70 percent of beads shall be buried in the marking, and the remaining 30 percent shall be 50 to 60 percent embedded in the surface. Beads installed on crosswalks and stop lines on roadways with curbs only (no gutter) may be hand applied for two feet at the end of each line next to the curb with 100 percent of the beads embedded 50 to 60 percent in the surface.

Markings found to be unacceptable shall be removed, and new markings applied at the Contractor’s expense.

1.9 Type A Markings

Paint may be applied to asphalt concrete and hydraulic cement concrete pavements. Paint shall not be applied over existing pavement markings of other materials unless the existing marking is 90 percent removed. Paint may be applied over existing paint markings. Paint shall be applied with a line painting machine that is capable of hot spraying paint directly onto the pavement surface with a uniformity of feed through its nozzles for widths of 4 through 8 inches. The machine shall be capable of applying two pavement stripes, either solid or skip, at the same time when double line markings are required. Paint tanks on the equipment shall be equipped with a mechanical agitator and paint shall be thoroughly mixed and heated such that it shall not track within 60 seconds after its application.

Non-truck mounted equipment shall be self-propelled and regulated to allow for calibration of the amount of material applied. Glass beads shall be applied to the surface of the paint at the rate of 6 pounds per gallon of paint.

1.10 Type B Markings

Equipment shall be capable of providing mixing, heating, and agitation of material. Material shall be uniformly heated throughout the system in accordance with the manufacturer's recommendations. Thermoplastic material shall be maintained in the heating kettle and applied to the road surface at a minimum temperature of 400 degrees F. Heating kettles shall be equipped with an automatic thermostatic control device. The Contractor shall furnish a properly calibrated infrared instrument for the purpose of measuring the actual temperature of molten thermoplastic material.

Multi-component material shall be applied using internally injected guns for the mixing of catalyst and hardener.

Non–truck mounted equipment for application of thermoplastic material shall be of the screed extrude type with a screw driver or shall be self-propelled and regulated to allow for calibration of the amount of material applied. Non–truck mounted equipment for application of polyester and epoxy resin material shall be self-propelled and regulated to allow for calibration of the amount of material applied.

1.11 Thermoplastic (Class I)

Thermoplastic (Class I) material shall be applied only on asphalt concrete pavements and shall be applied by screed extrude, ribbon gun, or spray equipment. Alkyd thermoplastic may be applied directly after the paving operations; however, hydrocarbon thermoplastic shall not be applied less than 30 days after the paving operations.

Alkyd and hydrocarbon materials shall not be mixed together. Equipment shall be thoroughly cleaned before types of material are changed.

Thermoplastic shall not be applied over existing pavement markings of other materials unless the existing marking is 90 percent removed. Thermoplastic may be applied over existing thermoplastic markings. For concrete bridge decks that occur in asphalt roadways, Type B, Class VI, tape shall be used.

Primer/adhesive shall be applied to asphalt concrete surfaces more than 2 years old and shall be from the same manufacturer as the thermoplastic.

Glass beads shall be applied to the surface of the marking at the rate of 7 pounds per 100 square feet.

1.12 Polyester Resin (Class II)

Polyester resin (Class II) material shall be applied only on hydraulic cement concrete pavements. Polyester resin shall not be applied over existing pavement markings of other materials unless the existing marking is 90 percent removed.

Polyester resin may be applied over existing polyester resin markings.

Glass beads shall be applied to the surface at the rate of 8 pounds per gallon of material.

1.13 Epoxy Resin (Class III)

Epoxy resin (Class III) material shall be applied only to asphalt concrete pavement more than 1 day old and hydraulic cement concrete pavement. Epoxy resin shall not be applied over existing pavement markings unless the existing marking is 90 percent removed.

Glass beads shall be applied by the gravity method to the surface at the rate of 25 pounds per gallon of material.

1.14 Plastic Backed Preformed Tape

Plastic-backed preformed tape shall be installed in accordance with the manufacturer's recommendations and as denoted herein. Tape may be applied to asphalt concrete and hydraulic cement concrete pavements. Tape may be installed immediately following the final rolling of the new asphalt concrete surface. Tape shall not be applied over existing pavement markings of other materials unless the existing marking is 90 percent removed.

Primer/adhesive shall be used for all installations except when tape is applied immediately following the final rolling of the new asphalt concrete surface and shall be from the same manufacturer as the tape.

Tape for pavement line markings shall be applied by an application cart as recommended by the manufacturer. Tape shall be tamped into place with a tamper cart with the weight as recommended by the manufacturer. The use of a vehicle to ride over the markings for tamping shall not be permitted.

1.15 Eradication

Eradication of pavement markings for restriping when required shall be in accordance with the requirements of Section 512 of the VDOT Road and Bridge Specifications except only 90 percent removal of the existing markings is required.

1.16 Colored Asphalt Coating

Installers shall be accredited by the manufacture. Materials shall be installed in accordance with the manufacturer's written instructions. The Contractor shall apply a minimum of two coats.

PART 4 – MEASUREMENT AND PAYMENT

4.1 Temporary pavement line markings

The cost of installing, maintaining, and removing all temporary pavement markings shall be borne by the Contractor at no cost to the County.

4.2 Pavement Line Marking

Measurement of pavement line markings (type, class, width) shall be per linear foot of line furnished and installed.

No additional measurement shall be made when more than one line can be installed on a single pass such as center line with no-pass line, double center line, double lane line, reversible lane line, or two-way left turn center line.

Payment for pavement line markings (type, class, width) shall be per linear foot and shall include all labor, materials, tools, equipment, transportation, supplies, and incidentals required to furnish and install the line markings as specified.

No deduction shall be made for the unmarked area when the marking includes a broken line such as, skip lane line.

4.3 Colored Asphalt Coating

Measurement of colored asphalt coating shall be per square foot of area completed. Payment for colored asphalt coating shall be per square foot and shall include all labor, materials, tools, equipment, transportation, supplies, and incidentals required to complete the coating.

4.4 Removal/Eradication of Existing Pavement Markings

Payment for pavement line markings (type, class, width) removal and/or eradication shall be paid by actual work performed as listed in the contract and shall include all labor, materials, tools, equipment, transportation, supplies, and incidentals required to remove and/or eradicate the line markings as specified.

PART 1 - General

1.1 Description of the Work

Provide all plant, labor, materials and equipment to install water mains or sewer pipes by tunneling under railroad or highway crossings as called for on the approved plans and as specified herein.

1.2 Related Work Specified Elsewhere

Section 02110 - Demolition
Section 02202 - Rock Excavation
Section 02510 - Sanitary Sewers & Appurtenances
Section 02550 - Water Mains & Appurtenances
Section 03100 - Concrete Formwork, Reinforcement & Materials
Section 04100 - Mortar and Grout
Section 04200 - Masonry Units

1.3 Applicable Specifications

A. American Association of State Highway and Transportation Officials (AASHTO)

B. American Society of Testing and Materials (ASTM)

C. United State Bureau of Mines

1.4 Applicable References

Erosion and Sediment Control Ordinance (Chapter 57 of the Arlington County Code)

1.5 Permits and Regulations

The County shall obtain all permits required except those permits required for blasting as specified in Section 02110. The Contractor shall conform to the regulations set forth by the authorities having jurisdiction over the work performed in the areas of tunnel crossings.

1.6 Submittals

Submit detailed shop drawings which shall include the location of the tunnel pits, soils data, method of excavation and support, method of dewatering, tunnel linings showing thickness, size, shape and method of attachment, and grouting details. Include details on the method of installing the carrier pipe.

PART 2 - MATERIALS

2.1 Tunnel Liner Plates

The tunnel liner plates shall be fabricated from structural quality, hot-rolled, carbon steel sheets or plates conforming to ASTM A-570, Grade B for sheets, or ASTM A-283, Grade B for plates. Liner plates shall be galvanized to meet the requirements of AASHTO M-167 and shall provide a minimum diameter of 4'-0-inch. Where specified, the tunnel liner plates shall be bituminous coated to meet the requirements of AASHTO M-190.

All tunnel liner plates shall be flanged and punched for bolting on both longitudinal and circumferential joints and shall be fabricated so as to permit erection from the inside.

2.2 Bolts and Nuts

Bolts and nuts shall be quick acting, coarse thread not less than 1/2-inch in diameter for specified plate thicknesses up to and including 0.179 inches and 5/8-inch in diameter for liner plates of greater thicknesses. Bolts and nuts shall conform to ASTM A307 Grade A and shall be galvanized as per ASTM A153.

2.3 Carrier Pipe

Water mains and sewers shall be as specified in Section 02550 and Section 02510 respectively.

2.4 Concrete

Concrete used in tunneling construction shall be as specified in Section 03100.

2.5 Brickwork

Brick and masonry work performed at the ends of the tunnel shall be as specified in Sections 04100 and 04200.

2.6 Forced Grout

Grout that is force injected between tunnel line plates and tunnel wall shall be one part Portland cement (ASTM C150, Type II), and six parts sand (ASTM C33).

2.7 Equipment

A. Tunneling equipment shall be as approved by U.S. Bureau of Mines.

B. The grout pump and injection system shall deliver the grout in a smooth and even flow without surge while developing a uniform pressure of 50 psi at the grout hole connection.

PART 3 - EXECUTION

3.1 General

A. Maintain free and full use of the surface on private property, streets, roadways and railways, under which tunneling construction takes place. Maintain close observation of surface facilities to detect settlement or displacement. Notify the Engineer immediately if settlement is detected. Take appropriate action to maintain safe conditions and prevent damage.

B. Should the Contractor elect to sink shafts at any point on the tunnel alignment for more efficient construction, he shall obtain permission from the holders of private property or the agencies having jurisdiction over the property, easement, or right-of-way. Remove excavation from such shaft or shafts, as well as all mucking, from the premises to storage dumps acquired by the Contractor at his own cost and expense. Backfill shafts at no expense to the County with materials approved for backfilling by the Engineer. Line shafts with steel liner plate of structural adequacy to withstand all earth pressures. Plates shall form a concentric circle and be bolted in place as the shaft is sunk. Extend the liner plates above the surface 3-/12' for protection of the public. No shaft shall be less than 12' in diameter. Where shafts are at portals, timber sheeting and bracing of structural adequacy may be used as an alternate to steel liner plates if permission is granted by the Engineer in writing.

3.2 Ventilation System

Furnish, install, operate and maintain a temporary ventilation system for the removal of dust in the tunnel shaft according to local and Federal regulations.

3.3 Electric Lights

Provide temporary electric lights to properly and safely illuminate all parts of the tunnel construction area with special illumination provided at the working face. Lighting circuits shall be thoroughly insulated and separated from power circuits, and shall be enclosed in wire cages. Secure all necessary electrical permits for successful completion of this aspect of the work.

3.4 Excavation for Tunnel Liner Plates

On initial set-up, support the tunneling equipment on a concrete cradle poured to permit the proper installation of the tunneling. During forward movement of tunneling operations,

provide sufficient support at the tunnel face to ensure that only materials physically displaced by the tunneling equipment are removed.

Excavation for liner plates shall proceed in increments sufficient for the erection of one ring of liners; install liner plates immediately after each increment of excavation. Keep voids behind liner plates to a minimum.

3.5 Installation of Tunnel Liner Plates

Handle liner plates in such a manner as to prevent bruising, scaling, or any other damage to the linings and coatings.

Ensure that the plate edges are clean and free from material that could interfere with proper bearing during installation.

Assemble liner plates to the lines and grades shown on the Contract Drawings in accordance with the manufacturers recommendations. Retention or replace any bolt that does not meet the requirements.

On 8' centers and in the liner plate at the top of each ring, there shall be a 2-inch standard half pipe coupling welded into a hole in the liner plate and cast iron closure plugs screwed therein. On the completion of each day's work the cast iron plugs shall be removed and the voids between the outside of the liner plate and the earth or rock shall be completely filled by pressure grouting with one part Portland cement and 6 parts mortar sand. The pressure shall be adequate to fill all the voids, but not great enough to bulge the liner plates.

3.6 Installation of Carrier Pipe in Tunnel

The carrier pipe shall be laid to the true line, grade, and elevations called for in the approved plans. Mount pipe on blocks, saddles, or other approved methods to obtain the exact lines and grades. Secure carrier pipe against flotation or vertical movement in accordance with standard details or as otherwise approved by the Engineer. Protect the ends of tunnel against entry of foreign matter and water with brick and masonry construction of 6-inch minimum grout. Provide 2-inch weep hole at each end of tunnel. Grout or provide sand as shown on the Standard Detail M-5.0.

3.7 Rock Excavation

Rock excavation shall be carried out as specified in Section 02202.

PART 4 - MEASUREMENT AND PAYMENT

Measurement shall be in linear feet of the tunnel liner plate invert. Payment shall include all work required for the casing pipe and carrier pipe to be installed, complete in place. Demolition, excavation, restoration and all other work not specifically listed as a separate pay item shall be considered incidental and no separate payment shall be made.

PART 1 - GENERAL

1.1 Description of the Work

Provide all plant, labor, materials and equipment to install water mains or sewer pipes by boring and jacking under highway crossings as called for on the approved plans and as specified herein.

1.2 Related Work Specified Elsewhere

Section 02202 - Rock Excavation
Section 02510 - Sanitary Sewers and Appurtenances
Section 02550 - Water Mains and Appurtenances
Section 03100 - Concrete Formwork, Reinforcement and Materials
Section 04100 - Mortar and Grout
Section 04200 - Masonry Units

1.3 Applicable Specification

American Water Works Association (AWWA)

1.4 Applicable Reference

Erosion and Sediment Control Ordinance (Chapter 57 of the Arlington County Code)

1.5 Permits and Regulations

The County shall obtain all permits. The Contractor shall conform to the regulations set forth by the authorities having jurisdiction over the work performed in the areas of bore and jack construction.

1.6 Submittals

Submit detailed drawings which shall include the location and size of pit, the method of boring and jacking, the size, capacity and arrangement of equipment, the method of dewatering, and the method of controlling line and grade.

PART 2 - MATERIALS

2.1 Casing Pipe

The casing pipe used shall be black seamless steel pipe with a minimum thickness of 3/8-inch of the sizes shown on the Standard Detail. Pipe shall have a minimum yield strength of 35,000 psi and shall conform to AWWA C-200.

2.2 Carrier Pipe

Water mains shall be as specified in Section 02550 and sewer pipes as specified in Section 02510.

2.3 Concrete

Concrete shall be as specified in Section 03100.

2.4 Brickwork

Brick and masonry work as performed at the ends of the casing pipe shall be as specified in Sections 04100 and 04200.

2.5 Equipment

Boring and jacking equipment shall be at the Contractor's option.

PART 3 - EXECUTION

3.1 General

A. If an obstruction is encountered during installation which stops the forward action of the pipe and makes it impossible to advance the pipe, notify the Engineer immediately. If necessary, operations shall cease and the pipe shall be abandoned in place and either plugged or filled completely with grout.

B. Maintain close observation of surface facilities to detect settlement or displacement. Notify the Engineer immediately if settlement or displacement is detected. Take action to maintain safe conditions and prevent damage.

3.2 Construction of Boring Pit

Excavate boring pit in accordance with detailed drawing specified in Paragraph 1.6. The pit shall be of adequate length to provide room for the jacking frame, the jacking head, the reaction blocks, the jacks and two sections of casing pipe. The pit shall be wide enough to

allow ample working space on either side of the jacking frame. The depth of the pit shall be such that the invert of the pipe when placed on the guide frame shall be at the desired elevation for the finished line. The pit shall be tightly sheeted and kept dry at all times.

Design and install the reaction blocks to carry the thrust of the jacks to the soil without excessive soil deflection and in such a manner as to avoid any disturbance of adjacent structures or utilities.

Provide adequate protective railings and/or fences at the top of the pit at all times.

3.3 Boring and Jacking Operation

Provide removable auger and cutting head arrangement. Arrange the face of the cutting head to provide reasonable obstruction to the free flow of soft material. Push the pipe with boring auger rotating within the pipe to remove the spoil. Over cut by the cutting head shall not exceed the outside diameter of the casing pipe by more than 1/2-inch.

Use hydraulic jacks in the jacking operation and take extreme care to hold the pipe to the exact lines and grades shown on the Contract Drawings. Excavation at the heading shall not exceed on foot ahead of the lead pipe. As one section of casing pipe is installed, the next section shall be aligned on guide timbers and welded to preceding section, and the boring and jacking process continued.

3.4 Installation of Carrier Pipe

Lay the carrier pipe to the true line, grade and elevations called for on the Contract Drawings. Use rollers, timber skids or other supports, approved by the Engineer, strapped to the carrier pipe inside of the casing pipe to avoid the pipe resting on any bells and to keep the completed installation at the required line and grade.

Protect the ends of the casing pipe against entry of foreign matter and water with brick and masonry construction or 6-inch minimum grout. Provide 2-inch weep hole at each end of casing pipe.

3.5 Rock Excavation

Rock excavation shall be as specified in Section 02202.

PART 4 - MEASUREMENT AND PAYMENT

Measurement shall be in linear feet of casing pipe installed. Payment shall include all demolition, excavation, restoration and other work required for the casing pipe and carrier pipe to be installed, complete in place. All other work shall be considered incidental and no separate payment shall be made.

PART 1 - GENERAL

1.1 Description of Work

Provide all plant, labor, materials and equipment necessary for the completion of the plain and reinforced concrete called for on the approved plans.

1.2 Related Work Specified Elsewhere

Section 03400 - Precast Concrete

1.3 Applicable Specifications

A. American Concrete Institute (ACI)

B. American Society for Testing and Materials (ASTM)

C. United States Product Standards PS I-66

D. Virginia Department of Transportation, Road and Bridge Specifications (VDOT)

E. Wire Reinforcement Institute (WRI)

1.4 Quality Assurance The following codes and standards are hereby made a part of this specification and concrete work performed shall conform with the applicable references except as specified otherwise in this section.

ACI Standard 318-71 - Building Code Requirements Reinforced Concrete (Working Stress Design) ACI Standard 318 - Building Code Requirements for Reinforced Concrete ACI Standard 315 - Manual of Standard Practice for Detailing Reinforced Concrete Structures ACI Committee Report - Concrete Sanitary Engineering Structures, ACI Committee 350 ACI Standard 301 - Specifications for Structural Concrete for Buildings Wire Reinforcement Institute, Inc., WRI - Manual of Standard Practice Virginia Department of Transportation, Road and Bridge Specifications (VDOT)

1.5 Submittals

A. Shop drawings shall include bar tabulations, placement drawings and details.

B. The Concrete Plant shall provide the concrete mix design and certified test reports on the aggregate, admixture, cement, and curing materials to be incorporated in the concrete for the project.

C. The steel fabricator shall provide certified mill test reports for the reinforcing steel and accessories to be incorporated in the work.

D. The Contractor shall provide delivery tickets for concrete and shall include the date, time, truck identification, concrete plant, plant inspector, ticket and load number, concrete class and design mix, moisture content of aggregates, quantity and location of placement.

PART 2 - MATERIALS

2.1 General

Concrete materials, methods of mixing, conveying, curing, placing, reinforcement, and the making and removal of forms shall conform to the latest requirements of Section 217 of the VDOT Specifications.

2.2 Class of Concrete

Cast-in-place concrete shall be Class A3 General Use (3,000 psi) or Class B2 (2,200 psi) unless stated otherwise on the approved plans.

2.3 Earth Forms

Except for the bearing surface of thrust blocks, concrete cradle, concrete encasements, and the second pours of drop manholes, do not place concrete directly against vertical surfaces of the soil.

2.4 Plywood

Except where noted otherwise on the approved plans, use plywood forms for all concrete which shall be exposed in the finished work, and for all exterior walls below grade which are to receive membrane waterproofing. Plywood shall conform to U.S. Product Standard PS 1-66 and shall be a minimum of 5/8-inch thick. Each panel shall carry the grade trademark of the American Plywood Association along with the DFPA (Douglas Fir Plywood Association) Quality stamp.

2.5 Form Coating

Use non-grain raising and non-staining type that shall not leave residual matter on surface of concrete or adversely affect proper bonding of subsequent application of other material applied to concrete surface, such as “Nox-Crete Form Coating” as manufactured by the Nox-Crete Company, “Arcal-80” as manufactured by Arcal Chemical Corporation, “Synthex” as manufactured by Industrial Synthetics Company, or approved equal. Do not use coatings containing mineral oils or other non-drying ingredients.

PART 3 - EXECUTION

3.1 General

A. Employ a competent and acceptable crew leader for concrete work. This crew leader shall be thoroughly familiar with all phases of concrete construction, including forms.

B. Be responsible for the capacity of all form work, shoring and bracing to carry all superimposed live and dead loads before, during and after concrete is poured.

C. Provide form work with adequate cleanout openings to permit inspection and easy cleaning after reinforcement has been placed. Where possible, place these openings in the side of the unexposed surfaces.

3.2 Construction of Forms

A. General: Construct wood forms of sound material, and of the correct shape and dimensions, constructed tightly and of sufficient strength. Brace and tie the forms together so that the movement of men, equipment, materials, or placing and vibrating the concrete shall not throw them out of line or position. Forms shall be strong enough to maintain their exact shape under all imposed loads. Camber where necessary to assure level finished soffits. Construct forms that may be easily removed without damage to the concrete. Before concrete is placed in any form, the horizontal and vertical position of the form shall be carefully verified and all inaccuracies corrected. Complete all wedging and bracing in advance of placing concrete.

B. Chamfered Corners: Unless otherwise indicated, provide chamfered corners on all exposed corners. Provide 3/4 inch moldings in forms for all chamfering required.

C. Embedded Items: Make provision for sleeves, anchors, inserts, water stops, and other features.

D. Form Ties: Use form ties of sufficient strength and in sufficient quantities to prevent spreading of the forms. Place ties at least 1-inch away from the finished surface of the concrete. Do not use ties consisting of twisted wire loops. Leave inner rods in concrete when forms are stripped. Space all form ties equidistant, and symmetrical, and line up both vertically and horizontally.

E. Cleanouts and Access Panels: Provide removable cleanout sections or access panels at the bottom of all forms to permit inspection and effective cleaning of loose dirt, debris, and waste material. Clean all forms and surfaces to receive

concrete of all chips, sawdust, and other debris and thoroughly blow out with compressed air just before concrete is placed.

F. Arrangement: Arrange formwork to allow proper erection sequence and to permit form removal without damage to concrete.

3.3 Preparation for Placing

A. Remove water from excavations before concrete is deposited. Divert any flow of water through proper side drains and remove water without washing over freshly-deposited concrete. Remove hardened concrete, debris, ice, and other foreign materials from the interior of the forms, and from the inner surfaces of mixing and conveying equipment. Do not place on frozen ground. Secure reinforcing in position and place vapor barrier and have inspected and approved before the concrete is poured. Do not wheel equipment used to deposit concrete over reinforcement.

B. Prior to placing of any concrete, and after placement of reinforcing steel in the forms, notify the Engineer so that proper inspection may be made. Such notification shall be made at least 48 hours in advance of placing concrete to permit proper arrangements for inspection.

3.4 Delivery

A. Submit a delivery ticket indicating the mix and design strength of the concrete, design slump, and time of leaving the truck mixer with each batch at the time of delivery. Record on the back of the delivery ticket: (a) the time of arrival of the truck mixer on the site; (b) the time of deposit of the concrete from the truck; and (c) the place of deposit of the concrete. The completed delivery ticket shall be delivered to the Engineer. Failure to deliver such completed ticket to the Engineer shall be cause for the Engineer to reject the deposited concrete at any time and cause it to be removed and replaced at no additional expense to the County.

B. Do not use concrete on the job site when it has exceeded the allotted mixing time as specified in Section of the 217.09 of the VDOT Specifications.

3.5 Placing Concrete

A. Before placing concrete, remove all construction debris, water and ice from the places to be occupied by the concrete. Give particular attention to the removal of dirt and debris from all formed construction joints.

B. Concrete, when deposited, shall have a temperature ranging between a minimum of 50 degrees Fahrenheit and a maximum of 90 degrees Fahrenheit. When the temperature of the surrounding air is below 50 degrees or above 90 degrees Fahrenheit, concreting shall be done in accordance with the recommendations noted in ACI-306 and ACI-305 respectively.

C. Mix concrete in such quantities as required for immediate use and place prior to loss of slump. Do not retemper concrete.

D. Spade, work and vibrate concrete as it is being poured, to secure its maximum density, free from voids and completely filling the forms. Thoroughly work concrete to secure the complete envelopment of all parts of the reinforcing steel and completely fill the corners of the forms. Maintain not less than 2 approved vibrators on the work at all times. Use tremies or chutes for drops of more than 5-feet.

E. Fill under Slabs on Grade: Clean sand, or aggregate, evenly spread and compacted to the full depth, unless otherwise shown on the Contract Drawings.

3.6 Removal of Forms

A. After concrete has been placed, all forms, bracing and supports shall remain undisturbed long enough to allow the concrete to reach the strength necessary to support with safety its own weight plus any live load and earth pressure that might be placed upon it without causing excessive settlement or deflective or any temporary or permanent damage to the structure. Prevent the breaking of edges and corners of concrete in the stripping of forms. Upon removal of formwork, immediately patch honeycombed areas and other voids to the satisfaction of the Engineer.

B. Thoroughly clean forms and recoat with specified form coating before each reuse. Do not reuse any form for exposed work which cannot be reconditioned to ”like new” condition. Discard forms considered unsatisfactory by the Engineer. Apply form coating to all forms in accordance with the manufacturer's specifications. Apply form coatings before placing reinforcing steel.

3.7 Protection of New Work

A. Protect all freshly placed concrete from mechanical injury or action of the elements until such time as the concrete is thoroughly set.

B. Protect projecting inserts, anchor bolts and other embedded items from disturbances until the concrete has sufficiently set to hold such items. \

3.8 Preformed Joints

A. Furnish and install preformed expansion joint material at locations shown on the Contract Drawings. Cut preformed expansion joint material slightly less than the full width of the cross section of the concrete to allow for a liquid joint sealant with any backup material.

B. Tool the concrete edges at expansion or contraction joints to a one-eighth (1/8)inch radius.

3.9 Finishing

A. All areas of exposed concrete walls and appendages from the top of the wall to 1'-6-inch below the finished grade or water level of the structure shall receive a rubbed finish applied in the following manner:

1. After removal of forms, point cavities, stone pockets, and tie holes in exposed surfaces with mortar by thoroughly wetting the repair area. Cut out honeycombs down to dense concrete, and then patch and point as
described above. The mortar mix for patching shall be determined by trial to obtain a good color match with the concrete when both patch and concrete are cured and dry. The amount of mixing water shall be as little as consistent with the requirements of handling and placing the mortar.

2. Ground off form joint marks and fins to a smooth surface, dense and free of prominent grain markings and bulges or depressions more than 1/8-inch in 4 feet.

3. When the mortar pointing has set, the entire exposed concrete surface shall be thoroughly covered with water by means of brush and rubbed with carborundum brick to remove all blemishes and leave the entire exposed surface uniform in color and texture.

B. All areas of walls not covered above shall have all fins and projections removed. Patch all voids and depressions exceeding 3/8-inch in any dimensions.

C. Unless otherwise noted or specified, all slabs shall be finished monolithically. Exposed concrete slabs shall have a tolerance of 1/8-inch in 10 feet with maximum high and low variance not occurring in less than 20 feet, and with 1/16-inch tolerance in any one running foot with no abrupt variations.

D. After screeding and floating, give concrete steps and slabs a light steel toweling to seal the surface and remove any irregularities left by the float. Just before the concrete becomes non-plastic, the surface of the concrete shall be given a fine broom finish perpendicular to the line of traffic and so executed that the corrugations thus produced shall be uniform in character and width. The broomed surface shall be free from porous spots, irregularities, depressions, and small pockets or rough spots such as may be caused by accidentally disturbing particles of coarse aggregate embedded near the surface. Use a coarse broom to provide a non-slip surface for ramps.

3.10 Curing

A. Curing shall be started as soon as it is possible to apply the curing medium without damaging the surface, preferably immediately upon completion of the finishing operation.

Curing shall continue uninterrupted for a minimum period of 14 days. Rapid drying upon completion of the curing period shall be prevented. At no time during the curing period shall the temperature of the concrete be permitted to drop below 40 degrees Fahrenheit.

3.11 Sampling, Testing and Enforcement

A. The Contractor shall furnish such facilities as the Engineer may require for on site testing and for collecting and forwarding concrete samples for testing to an approved independent laboratory selected by the Engineer. The laboratory shall establish the mix proportions and test the concrete. One test shall be performed

for each 10 cu. yds. of concrete. The laboratory shall maintain records showing brand of cement, brand and quantity of admixtures, time and location of the batch from which the test was made, air content, slump, and compressive strength. The laboratory shall supply the test cylinders, slump cones, field technicians, and all equipment necessary for performance of field and laboratory testing specified herein.

B. One strength test shall consist of four field specimens. One (1) specimen for testing at seven (7) days, one (1) specimen for testing at fourteen (14) days, and two (2) specimens for testing at twenty-eight (28) days. The samples for strength tests shall be taken in accordance with –"Method of Sampling Fresh Concrete" (ASTM C-172). Cylinders for acceptance tests shall be molded and laboratory-cured in accordance with "Method of Making and Curing Concrete Compression and Flexure Test Specimens in the Field" (ASTM C-31) and tested in accordance with "Method of Test for Compressive Strength of Molded Concrete Cylinders" (ASTM C-39). Each strength test result shall be the average of two cylinders from the same sample tested at seven (7), fourteen (14) and twenty-eight (28) days.

C. When the frequency of testing shall provide less than five strength tests for a given class of concrete, make tests from at least five randomly selected batches or from each batch if fewer than five are used. When the total quantity of a given class of concrete is less than 30 cu. yds., the strength tests may be waived by the Engineer if, in his judgment, adequate evidence of satisfactory strength is provided.

D. Should individual tests of laboratory-cured specimens produce results more than 500 psi below specified strength (f'c), or tests of field-cured cylinders indicate deficiencies in protection and curing, take steps to assure that

loadcarrying capacity may have been significantly reduced, tests of cores taken from the area in questions shall be required in accordance with "Standard Method of Obtaining and Testing Drilled Cores and Sawed Beams of Concrete" (ASTM C-42). Three cores shall be taken for each cylinder test more than 500 psi below specified strength (f'c). If the concrete in the structure shall be more than superficially wet under service conditions, the cores shall be immersed in water for at least 48 hours and tested wet.

E. Concrete represented by the above core tests shall be considered structurally adequate if the average of the three cores is equal to at least 85 percent of specified strength (f'c) and if no single core is less than 75 percent of f'c. To check testing accuracy, locations represented by erratic core strengths may be retested. If these strength acceptance criteria are not met by the core tests, and if structural adequacy remains in doubt, the Engineer shall order load tests for the questionable portion of the structure, or declare the section to be defective.

3.12 Defective Concrete

A. Defective concrete is defined as concrete in place which does not conform to strength, shapes, alignments, appearance, and/or elevations as shown on the drawings; areas which contain faulty surface areas and/or concrete surfaces not finished in accordance with these specifications.

B. Remove all defective concrete and replace in a manner meeting with the Engineer's approval. Should only surface imperfections occur, patch at the discretion of, and in a manner satisfactory to, the Engineer. Permission to patch the work shall not be considered as a waiver of the County's right to require complete removal and replacement of such defective work should the patching fail to satisfactorily restore the required quality and appearance of the work.

PART 4 - MEASUREMENT AND PAYMENT

4.1 Concrete work associated with cast-in-place structures, curbs, sidewalks shall be paid for under the appropriate unit item called for in the bid proposal.

4.2 Concrete steps shall be measured by step per width category. Payment shall include all labor, materials and equipment necessary for a complete installation.

4.3 Demolition, excavation and restoration shall be considered incidental to the work and therefore, no separate payment shall be made for demolition, excavation or restoration.

PART 1 - GENERAL

1.1 Description of Work

Provide all plant, labor, equipment and material to provide the precast concrete structures including manholes but excluding pipe, as called for on the approved plans, Construction Standards and this section.

1.2 Related Work Specified Elsewhere

Section 02500 - Storm Sewers and Drainage Systems
Section 02510 - Sanitary Sewers and Appurtenances
Section 03100 - Concrete, Formwork, Reinforcement and Materials

1.3 Applicable Specifications

A. American Society for Testing and Materials (ASTM)

B. Virginia Department of Transportation, Road and Bridge Specifications (VDOT)

1.4 Quality Assurance

A. All precast concrete items shall be products of one or more manufacturers having demonstrated competence in the design and production of precast concrete specialties of the types specified herein for a minimum of 3 years.

B. The referenced documents of Section 03100 shall become a part of this section.

1.5 Submittals

A. Prior to delivering any material to the project site, submit to the Engineer for approval shop drawings for fabrication and setting of the precast concrete work, along with manufacturer's detailed descriptive literature.

B. Submit certified concrete mix design for the structures to be furnished to the job site.

C. Submit certified test reports for the aggregate, cement, admixtures, reinforcing and curing materials used in the fabrication of the structures.

1.6 Class of Concrete

Concrete for precast structures shall be VDOT Class A4 General. Use unless stated otherwise on the approved plans.

PART 2 - MATERIALS

2.1 General

Concrete materials, methods of mixing, conveying, curing, placing, reinforcement, and the making and removal of forms shall conform to the latest requirements of the VDOT Section 217.

2.2 Precast Concrete Manholes

Precast concrete manhole bases, risers and cones shall conform to requirements of ASTM C478 with configurations as shown in the drawings. Cones shall be eccentric. Manhole sections for sanitary sewers shall be of male and female end type with a preformed groove provided in the male end for placement of a round rubber gasket ring. Rubber gasket rings shall meet the requirements of ASTM C-361 or C-443. The gasket shall be the sole element utilized in sealing the joint from either external or internal hydrostatic pressure. Use the appropriate lubricant as directed by the manufacturer. Manhole sections for storm sewers may use mortared joints.

Each precast section shall be clearly marked on the inside near the top with the following information where applicable: ASTM designation, Standard detail or drawing number, station location and designation, date of manufacture and name or trademark of manufacturers. Precast concrete manholes shall be manufactured by the Virginia Precast Corp., Valley Blox, Inc., or equal.

2.3 Precast Concrete Catch Basin

Precast concrete catch basins shall conform to the requirements of ASTM A-185 for welded wire fabric construction, or ASTM A-165 for deformed steel billet bars and the applicable provisions specified in Section 03100 except that the design mix (f'c) shall be 4,000 psi concrete.

PART 3 - EXECUTION

Fabrication and testing of the precast concrete structures shall be in accordance with the stipulated execution procedures of Section 03100.

PART 4 - MEASUREMENT AND PAYMENT

No separate measurement and payment shall be made for this work. It is covered under other work to which it relates.

PART 1 - GENERAL

1.1 Description of Work

Provide all labor, materials and equipment necessary to furnish and install mortar required for the masonry and mortared rubble work and miscellaneous grout as called for on the approved plans.

1.2 Related Work Specified Elsewhere

Section 04200 - Masonry Units

1.3 Applicable Specifications

A. American Society for Testing and Materials (ASTM)

B. Virginia Department of Transportation, Road and Bridge Specifications (VDOT)

PART 2 - MATERIALS

2.1 General

Mortar and grout shall conform to the latest requirements of Section 218 of the VDOT Specifications.

2.2 Mortar for Unreinforced Masonry and Brick

The mix for unreinforced masonry shall conform with ASTM C270, Type “M” with the following options:

A. Portland Cement Mortar: 1 part Portland cement; 1/4 part hydrated lime and lime putty; 3-1/2 parts sand.

B. Masonry Cement Mortar: 1 part Portland cement; 1 part masonry cement; 4-1/2 parts sand.

2.3 Mortar and Grout for Reinforced Masonry

The mix for reinforced masonry shall conform with ASTM C476 Type PM or PL.

PART 3 - EXECUTION

3.1 Storage of Materials

Protect materials from moisture, foreign material and deterioration.

3.2 Weather Requirements

Hot Weather: Add water as needed to supplement evaporation losses. Cold Weather: When air temperatures range between 32°F and 40°F, heat mixing water or aggregate to between 70°F and 160°F maximum. When air temperature is below 32°F, and only with the approval of the Engineer, heat both the mixing water and aggregate to between 70°F and 160°F maximum.

3.3 Quality Control

A. Prepare sample batches of mortars and grouts prior to beginning masonry work.

B. Test in accordance with ASTM C270 (Unit Masonry) or ASTM C476 (Reinforced Masonry), whichever applies. Send copies of test results to the Engineer for approval.

3.4 Mixing Mortar and Grout

Mix mortar in accordance with ASTM C270 (Unity Masonry) and mortar and grout in accordance with ASTM C476 (Reinforced Masonry). Mortar or grout not within 2-1/2 hours after mixing shall not be used in masonry work.

PART 4 - MEASUREMENT AND PAYMENT

No separate measurement and payment shall be made for this work. It shall be considered a subsidiary obligation of the Contract under other work to which it relates.

PART 1 - GENERAL

1.1 Description of Work

Provide all labor, materials and equipment necessary to furnish and install masonry as called for on the approved plans and as specified herein.

1.2 Related Work Specified Elsewhere

Section 04100 - Mortar and Grout
Section 09900 - Protective Coatings

1.3 Applicable Specifications

A. American Society for Testing and Materials (ASTM)

B. Virginia Department of Transportation, Road and Bridge Specifications (VDOT)

1.4 Submittals

Submit to the Engineer, two representative samples of each kind and type of masonry specified for the project and sample of anchors and ties. Do not purchase masonry until samples are approved by the Engineer.

PART 2 - MATERIALS

2.1 Masonry Units

Masonry block and brick units shall conform to Section 222 of the VDOT Specifications.

2.2 Welded Wire Fabric

Welded wire fabric shall conform to Section 228 of the VDOT Specifications.

2.3 Steel Reinforcement

Steel reinforcement called for on the approved plans shall be deformed bars, grade 40, in conformance with Section 223 of the VDOT Specifications.

2.4 Reinforcement, Anchors and Ties

A. Masonry joint reinforcement shall be factory fabricated from zinc coated colddrawn steel wire, ASTM A82. Reinforcement shall consist of two or more deformed longitudinal wires minimum size No. W1.5, weld connected with minimum size No. 21.5 cross wires, forming a truss or ladder design. Zinc

coating, ASTM A116, Class 1, except that cross wires used for cavity wall ties shall be Class 3. Out-to-out spacing of longitudinal wires shall be approximately 2-inches less than the nominal width of the block or with in which it is placed. Distance between welded contacts of cross wires with each longitudinal wire shall not exceed 16-inches. Joint reinforcement shall be furnished in flat sections 10 to 20 feet in length, except that factory-formed corner reinforcements and other special shapes may be less in length.

B. Anchors and ties shall be zinc-coated, ferrous metal of the types specified. Zinc coating ASTM A153, Class B-1, B-2, or B-3 as applicable. Cooper cladding of steel wire shall conform to the requirements as specified for Grade 30 HS wire in ASTM Specification B227.

PART 3 - EXECUTION

3.2 General

A. Build into masonry, bolts, anchors, nailing blocks, inserts, expansion joints and other items necessary and incidental to the completion of the project.

B. Masonry shall be laid with plumb, true to line, with level courses accurately spaced with a story pole, and unless otherwise shown, with each course breaking joints with the course next below. Each unit shall be adjusted to its final position in the wall while mortar is still soft and plastic. Any unit that is disturbed after mortar has stiffened shall be kept plumb throughout. Corners and reveals shall be plumb and true. Courses shall be so spaced that backing masonry shall level off flush with the face work at all joints where metal ties are used. Anchors, accessories, and other items required to be built in with masonry shall be built in as the masonry work progresses. Cutting and fitting of masonry shall be done by masonry mechanics with power-driven masonry saws.

C. Weather Requirements: Precondition and protect masonry units in cold weather as follows:

1. Avg. daily air temperature between 32°F and 40°F -- protect newly laid masonry from rain and snow 24 hours.

2. Avg. daily air temperature between 25°F and 32°F -- provide heat on both sides of construction masonry; use wind breaks for winds above 15 mph; cover masonry with insulating blankets for 24 hours.

3. Avg. daily temperature below 20°F -- provide enclosure and heat to maintain air at 32°F for 24 hours. Do not lay masonry units at temperatures colder than 30°F.

D. Before resuming work, top surface of masonry in place shall be cleaned of loose mortar and foreign material.

3.2 Storage

A. Store cementitious materials on pallets under a tarpaulin cover in a dry place. Covers shall overhang 2 feet down each side and be held securely in place.

B. Reinforcing, metal ties, and anchors shall be protected from contact with soil and before being placed shall be free from loose rust and other coatings that shall destroy or reduce the bond.

3.3 Laying Concrete Masonry Units

A. All sections herein shall apply to both ordinary masonry units and concrete catch basin units.

B. All concrete masonry units shall be running bond with units in the courses above regularly breaking joints with the units below, unless otherwise indicated on drawings.

C. Layout all openings before construction. The final location of openings shall be adjusted so that partial size units may be kept to a minimum.

D. Reinforcing mesh shall be installed in the three courses above all openings and shall extend 3 ft. 9 in. beyond each side of opening. Mesh shall be installed in every third course of all masonry unit walls.

E. Do not set patched, chipped, cracked, broken or otherwise defective units. Cut out defective joints and repoint.

F. All intersecting walls shall be keyed together with masonry units.

G. Cut block with a carborundum saw. Do not cut with hammer chisel.

H. Use solid load-bearing block where required for structural purposes. Use hollow load-bearing block at all other locations.

I. Leave all necessary openings for the passage of pipes and drains. At completion of the work of other trades, return and close all openings.

J. Keep the open space at control joints and expansion joints free of mortar by using a continuous wood or metal strip temporarily set in the wall. Caulk control and expansion joints.

K. Standard width of mortar joints for both horizontal and vertical joints shall be 3/8 inch. Joints shall have full mortar coverage on vertical and horizontal face shells, but mortar shall not extend through unit on the web edges. Compact mortar joints on the weather side of exterior walls and press tight against the edges of the units with a proper tool.

3.4 Brick

A. Lay all face brickwork in straight running bond, level, with joints struck flush, then tooled with a concave pointing tool. Courses shall equal 3 to 8 inches in height. Mortar beds shall be full. Fill voids solid with mortar. Fill all vertical joints with mortar except weep holes.

B. Carry facing and backing of exterior walls simultaneously and bond as required.

C. Set reinforcement flashing and ties every 2 sq. ft. of wall surface.

D. Provide rope wick weep holes, spaced approximately 32 in. on center, in vertical joints of first course, over all counter flashing and through wall flashing on all exterior walls.

E. Project bolts from the face of the masonry a sufficient distance to allow for the proper attachment intended. Oil all threads and protect by waterproof caps.

F. All joints shall be uniform and 3/8 inch thick unless otherwise indicated.

G. Joints in exposed or painted surfaces shall be tooled when thumbprint hard with a round jointer. Joints shall be flush on the vertical and concave on the horizontal.

H. Joints in unparged masonry below grade shall be pointed tight with a trowel.

I. Mortar joints in surfaces to be plastered, stuccoed, or covered with other masonry shall be cut flush.

J. Mortar protrusions extending into cells or cavities to be reinforced and filled shall be removed.

K. Fill horizontal joints between top of masonry partitions and underside of concrete slabs or beams with mortar.

3.5 Bonding with Masonry Bonders

A. Where two or more masonry units are used to make up a thickness of a wall, inner and outer wythes shall be bonded at vertical intervals not exceeding 34 inches by transverse lapping of stretcher units at least 3 inches over units below, or by lapping with units at least 50 percent greater in width than unit below at vertical intervals not exceeding 17 inches.

B. Bond intersecting bearing walls with metal ties at vertical intervals not to exceed 16 inches.

C. When intersecting bearing walls are carried up separately, regularly block (tooth) vertical joint with 8-inch maximum offsets. Provide joints with rigid steel anchors at vertical intervals not to exceed 48 inches. When approved, blocking may be eliminated and rigid steel anchors provided at vertical intervals not to exceed 24 inches.

D. Anchor abutting or intersecting interior non-load bearing walls with metal ties at vertical intervals not to exceed 24 inches and extending at least 4 inches into the masonry.

E. Construct all concrete masonry in accordance with the National Concrete Masonry Associations.

3.6 Angles and Beams

A. Adjust as required to keep masonry level and at proper elevation.

B. Embed beams firmly in mortar of same quality as used in laying masonry wall.

3.7 Jointing and Cleaning

A. At the completion of the work, all holes in joints of masonry surfaces, except weep holes, shall be filled with mortar and suitably tooled.

B. Dry brush masonry surface at the end of each day's work and after final pointing using wire brushes if necessary to remove mortar but exercise care not to scratch or damage work.

PART 4 - MEASUREMENT AND PAYMENT

Manholes, catch basins, and yard inlets constructed of masonry block and concrete block shall be measured as each. Payment shall include all masonry/block work, mortar, manhole steps, manhole frame and cover, inlet frame and cover, concrete slab, grout, demolition, excavation, backfill, restoration and all necessary appurtenant items. Other use of the masonry block and concrete block is covered under the work to which it relates.

PART 1 - GENERAL

1.1 Description of Work

Provide all plant, labor, materials and equipment for the construction of mortar rubble retaining walls as called for on the approved plans and as detailed in the Construction Standards and specified herein.

1.2 Related Work Specified Elsewhere
Section 04100 - Mortar and Grout

1.3 Applicable Specifications

Virginia Department of Transportation, Road and Bridge Specifications (VDOT)

PART 2 - MATERIALS

2.1 Mortar

Mortar shall conform to Section 222 of the VDOT specifications.

2.2 Stone

Stone shall conform to Section 204 and 508.03(a) of the VDOT specifications.

2.3 Concrete Rubble

Concrete rubble shall be approved by the Engineer. Concrete rubble available from the County shall be so noted on the approved plans.

2.4 Concrete Rubble Backing

Class A3 concrete conforming to Section 217 of the VDOT Specifications.

2.5 Filter Material

Filter material shall be Miraf 140, Typar 3401 or approved equal.

2.6 Backfill

Porous backfill shall be clean crushed stone or gravel aggregate size no. 57 or 68, in conformance with Section 204 of the VDOT Specifications.

PART 3 - EXECUTION

Construct mortar rubble masonry walls in conformance with the approved plans and the standard details. Shaping, dressing, cleaning, wetting, laying and other construction procedures
for the walls shall be performed in accordance with Section 508.03(b) of the VDOT Specifications.

PART 4 - MEASUREMENT AND PAYMENT

Mortar rubble masonry walls shall be measured in cubic feet based on the approved plans and sections. Payment shall include demolition, concrete rubble backing, excavation, backfill, restoration, testing of materials, labor, material and equipment necessary for a complete and structurally sound retaining wall in place.

PART 1 - GENERAL

1.1 Description of Work

A. Provide all plant labor, supervision, material and equipment to furnish and install all structural steel and miscellaneous metal items, with accessories, fasteners, anchors, etc., complete in place as shown on the approved plans.

1.2 Related Work Specified Elsewhere

Section 09900 - Protective Coatings

1.3 Applicable Specifications

A. American Institute of Steel Construction (AISC)

B. American Society for Testing and Materials (ASTM)

C. American Welding Society (AWS)

D. Virginia Department of Transportation, Road and Bridges Specifications (VDOT)

1.4 Submittals

A. Before any fabrication is begun, submit detailed shop drawings of all miscellaneous metal items showing sizes of metal components, method of assembly, hardware, and anchorage or connection to other work.

B. Submittals shall include detailed descriptive literature of manufactured items specified herein.

1.5 Quality Assurance

A. Fabrication and installation procedures shall conform to the specifications and practices of the American Institute of Steel Construction.

PART 2 - MATERIALS

3.1 General

A. Standard Structural Steel Shapes and Plates shall be in conformance with ASTM A-36.

B. Steel Pipe shall be in conformance with ASTM A-53, Type E or S, Grade A or B.C.Cast Iron shall be in conformance with ASTM A-48, Class 30, unless otherwise indicated. D. Fastenings shall be in conformance with Section 232(d), (e) and (f) of the VDOT specifications.

C. Welding Electrodes shall be as permitted by AWS Code D1.0.

D. The primers shall be as specified in Section 09900: Protective Coatings.

2.2 Pipe Handrails

A. General

Pipe handrails shall be galvanized steel pipe in conformance with Sections 233 of the VDOT Specifications. The rails shall be standard weight and the post shall be extra strong steel pipe. Standard or special fittings shall be used or the joints may be welded. Painting of railings shall meet the requirements of Section 09900.

B. Rail and Post Spacing

Post spacing shall not exceed 7' on center. Unless shown otherwise on the drawings, the top rail shall be located at a height of 3' 6-inch, (4'6-inch for bike trails), except stair runs shall have top rail at a height of 3' 6-inch and enclosed stair landings shall have top rail at a height of 3' 0-inch. Intermediate rails shall be located as shown on the Construction Standard R-3.1.

2.3 Gratings

All gratings shall be as indicated on the standard drawings.

2.4 Expansion Bolts

A. Bolts shall be “Wej-It” concrete anchors as manufactured by “Wej-It” Expansion Products, Inc., Broomfield, Col., ”Taper Bolt” as manufactured by U.S. Expansion Bolt Co., York, Pa., or approved equal.

Self-drilling expansion anchors where called for on the plans shall be “Red Heads” as manufactured by the Phillips Drill Co., Michigan City, Indiana, or approved equal.

Contractor shall submit certified test reports establishing shear and tensile pull out for the anchors used.

B. Bolts shall be of the same type as the members which they support, that is Type 2024-T6 alloy for aluminum shapes and hot dipped galvanized steel for structural steel shapes. Stainless steel bolts shall be used in all process units.

PART 3 - EXECUTION

3.1 General

A. Furnish all bolts, nuts, screws, clips, washers, and any other fasteners necessary for proper installation of items specified or called for on the approved plans. For ferrous metal, use stainless steel or galvanized on exterior. On interior, match adjacent material.

B. Metal for shop-fabricated items shall be well formed to shape and size, with crisp lines or angles. Shearing and punching shall leave clean, true lines and surfaces. Weld permanent connections and grind smooth where exposed to view. Dress all sharp edges.

C. Verify all measurements at job.

D. Field drilled or punched holes; do not use cutting torch. Shearing and punching shall leave true lines and surfaces.

E. Construct to sizes indicated using rolled shapes and/or plates as detailed. Include wall and sill anchors for construction indicated.

F. Set all work plumb, true, rigid, and neatly trimmed out.

G. Grout plates, bolts, and similar items with non-shrink grout.

H. Ship railings with factory-preassembled posts and fittings. Assemble on location in accordance with manufacturer's instructions, keeping posts plumb and posts parallel to either horizontal or rake.

I. Castings subject to foot or street traffic shall have bearing surfaces machined to prevent rocking and rattling.

J. Protect all dissimilar metals from galvanized corrosion by pressure tapes, coatings or isolators.

3.2 Welding

A. Perform all ferrous metal welding in accordance with AWS Code D1.0. Use only pre-qualified welding procedures in accordance with AWS paragraph 103(a) and only by operators experienced in performing the type of work indicated.

B. Weld pipe handrail in accordance with Section 407 of VDOT Specifications.

3.3 Bolted Connections

A. In general, use bolts for field connections only and then only as detailed. Provide washers under all heads and nuts bearing on wood. Draw all nuts tight and nick threads of permanent connections to prevent loosening. Use beveled washers where bearing is on sloped surfaces.

B. Provide grating with necessary minimum clearances and fit so as to lie flat and not rock in any fashion. Provide U-clips in each corner of the grating sections.

3.4 Protection of Surfaces

A. Provide protection by strippable coating, protective sleeves, polyethylene sheets, boarding, or other suitable means during fabrication, shipment, site storage, and erection to prevent damage to the finished work due to stains, discolorations, scratches, or any other cause. Replace damaged elements at no expense to the County.

B. After installation, and after danger of subsequent damage has passed, remove all protective coverings from all exposed surfaces, and clean those surfaces of all soil and discoloration, ready for acceptance.

PART 4 - MEASUREMENT AND PAYMENT

4.1 Handrails shall be measured in linear feet installed. Payment shall include all labor, equipment and materials necessary for a complete installation.

4.2 Structural steel, including beams, girders, and miscellaneous steel, shall be paid for at the contract lump sum price or when specified in pounds of metal in the fabricated structure.

4.3 No separate measurement and payment shall be made for other work under this section. It shall be considered a subsidiary obligation of the Contract under other work to which it relates.

PART 1 - GENERAL

1.1 Description of Work

Provide all labor, material and equipment to furnish and construct with structural timber and lumber as called for on the approved plans and specified herein. The work includes timber and lumber construction and all other incidental construction.

1.2 Related Work Specified Elsewhere

Section 02100 - Clearing and Grubbing
Section 02110 - Demolition
Section 09800 - Wood Preservatives

1.3 Applicable Specifications

A. American Lumber Standards

B. Virginia Department of Transportation, Road and Bridge Specifications (VDOT)

1.4 Applicable References

A. American Association of State Highway and Transportation Officials (AASHTO)

B. National Forest Products Association (NFPA)

1.5 Product Handling

All structural timber and lumber shall be delivered, stored, handled and installed in a manner to prevent twisting, warping or other damage that would preclude satisfactory installation.

PART 2 - MATERIALS

2.1 Structural timber and lumber shall conform to Section 236 of the VDOT Specifications.

2.2 Where treated timber or lumber is required, the preservative and treatment shall be as specified in Section 09800 of these specifications titled: Wood Preservatives.

PART 3 - EXECUTION

3.1 Inspection

Timber and lumber shall be grade marked in accordance with grading rules and basic provisions of the ”American Lumber Standards” by a lumber grading or inspection bureau of agency approved by the Engineer.

3.2 Installation

The structural timber of lumber shall be installed properly in the sizes and grades and to the alignment with fastenings as shown on the approved plans.

PART 4 - MEASUREMENT AND PAYMENT

All timber and lumber shall be measured in units of 1,000 feet-board-measure (MFBM) based on nominal sizing for the materials actually placed in the finished structure according to the approved plans or as directed by the Engineer. Payment shall include all labor, materials and equipment, including preservatives and coatings, necessary for a complete installation.

PART 1 - GENERAL

1.1 Description of Work

Provide all plant, labor, equipment and materials to waterproof all sanitary manholes and other structures subject to hydrostatic head when called for on the approved plans.

1.2 Related Work Specified Elsewhere

Section 07150 - Damp proofing

1.3 Applicable Specifications

Virginia Department of Transportation, Road and Bridge Specifications (VDOT)

1.4 Applicable References

A. American Association of State Highway and Transportation Officials (AASHTO)

B. American Society of Testing and Materials (ASTM)

1.5 Quality Assurance

Provide certified test reports of testing required by referenced specifications.

PART 2 - MATERIALS

2.1 Primer, asphalt, fabric and joint sealers shall conform to Section 213 of the VDOT Specifications.

2.2 Membrane: System A, B, C or D as specified in Section 214.04 of VDOT Specifications or preformed elastomeric waterproofing as manufactured by Polyguard (No. 650), B.F. Goodrich (20 mil vinyl water barrier) or Grace (Bithuthene 3000).

PART 3 - EXECUTION

3.1 Waterproof exterior, below grade structures when called for on the approved plans.

3.2 Conform to Section 416 of VDOT Specifications when applying System A, B, C, or D expect that structures shall be treated as that specified for decks.

3.3 Conform to the manufacturer's printed instructions when applying preformed elastomeric waterproofing.

PART 4 - MEASUREMENT AND PAYMENT

No separate measurement and payment shall be made for this work. It shall be considered a subsidiary obligation of the Contract under other work to which it relates.

PART 1 - GENERAL

1.1 Description of Work

Provide all plant, labor, equipment and materials to damp proof structures not subject to hydrostatic head when called for on the approved plans.

1.2 Related Work Specified Elsewhere

Section 07100 - Waterproofing

1.3 Applicable Specifications

Virginia Department of Transportation, Road and Bridge Specifications (VDOT)

1.4 Applicable References

A. American Association of State Highway Transportation Officials (AASHTO)

B. American Society for Testing and Materials (ASTM)

1.5 Quality Assurance

Provide certified test reports of testing required by referenced Specifications.

PART 2 - MATERIALS

Primer and asphalt shall conform to Section 213 of the VDOT Specifications.

PART 3 - EXECUTION

Conform to Section 417 of VDOT Specifications.

PART 4 - MEASUREMENT AND PAYMENT

No separate measurement and payment shall be made for this work. It shall be considered a subsidiary obligation of the Contract under other work to which it relates.

PART 1 - GENERAL

1.1 Description of Work

Provide all labor, materials and equipment for the complete application of paint to new and or existing ferrous metal structures in the conformance with the requirements of the various sections of these specifications.

Painting shall conform to the requirements specified in the specifications and where called for on the approved plans or special provisions.

For safety precautions, the Contractor shall wear protective goggles and masks for the cleaning and painting of metal structures.

1.2 Related Work

Section 09900 - Protective Coatings

1.3 Applicable Specifications

A. American Society for Testing and Materials (ASTM)

B. American Association of State Highway and Transportation Officials (AASHTO)

C. Steel Structures Painting Council (SSPC)

D. Virginia Department of Transportation (VDOT)

E. Occupational Safety and Health Administration (OSHA)

F. Toxic Substance Control Act (TSCA)

G. Hazardous Material Transportation Act (HMTA)

H. United States Environmental Protection Agency (USEPA)

I. Virginia Department of Health, Solid & Hazardous Waste Management Division (VDH)

1.4 Surfaces not to be Painted

Refer to Section 09900, Paragraph 1.4

1.5 Submittals

Refer to Section 09900, Paragraph 1.5

1.6 Quality Assurance

A. Refer to Section 09900, Paragraph 1.6

B. Steel Structures Painting Council (SSPC):

SSPC-SP1-82	Solvent Cleaning
SSPC-SP2-82	Hand Tool Cleaning
SSPC-SP3-82	Power Tool Cleaning
SSPC-SP6-85	Commercial Blast Cleaning
SSPC-Visual	Pictorial Surface Preparation Standards For Painting Steel Surfaces

C. To assure quality control and the quality of the paint a representative of the paint manufacturer shall be present during the initial stages of mixing and application of the paint system.

1.7 Product Delivery, Storage and Safety Data

Product delivery, storage and safety data shall conform to the manufacturer's specification and Section 09900, Paragraph 1.7. All containers shall be labeled with:

A. Manufacturer's Name
B. Product Name & Number
C. Batch Number
D. Date of Manufacturer

1.8 Guarantee

Refer to Section 09900, Paragraph 1.8.

1.9 Weather Conditions

Paint shall be applied only on thoroughly dry surfaces and during periods of favorable weather conditions. Blasting and/or painting shall not be permitted when the atmospheric temperature is at or below 40°F. in the shade; when the relative humidity exceeds 85% at the site of work or when weather conditions would prevent obtaining a satisfactory job, such as anticipating rain, fog or any type of condensation, dust or when it can be anticipated that atmosphere temperature shall drop below 40°F. Painting shall not be permitted on surfaces that are sufficiently hot to cause blistering or when the surface is damp. The surface should be dry and at least 5°F above the dew point. Or as specified by the manufacturer.

1.10 Protection Against Damages

The Contractor shall provide protection devices such as tarps, screens, covers, as necessary to prevent damage to the work, other property, persons, or environment from all cleaning and painting operations.

A water trap acceptable to the Engineer, shall be furnished and installed on all equipment used in spray painting.

Paint or paint stains which result in an unsightly appearance on a surface not designated to be painted shall be removed by the Contractor at his expense and to the satisfaction of the Engineer.

All painted surfaces that are marred or damaged as a result of the Contractor's operation shall be repaired by the Contractor, at his expense, with materials and to a condition equal to the coating specified herein. Upon the completion of all painting operations and any other work that would cause dust, grease, or any other foreign materials to be deposited upon the painted surfaces, shall be thoroughly cleaned off to the satisfaction of the Engineer. If traffic conditions start to cause dust, the Contractor, when directed by the Engineer, shall sprinkle water or a dust palliative on area of the traveled way to control the problem. No additional payment shall be made for this work.

1.11 Special Stenciling

The date (month and year) of painting shall be stenciled by the Contractor in two locations on the structure, as directed by the Engineer. The block letters shall be 2 1/2-inch high, and the paint used shall be in distinct contrast with the background.

PART 2 - MATERIALS

2.1. Acceptable Manufacturers

The protective coating system specified under this specification is in reference to the Tnemec Company. Other systems are acceptable provided that they are equal or better than the system referenced to:

TNEMEC Company Incorporated, Richmond, VA.
Ditsler Company (Manufacturer's representative)
302 West Cary Street
Richmond, VA 23220DC Metro (804)780-3077

2.2 Paint Materials

The paint for new or existing structural steel or other metal surfaces shall conform to the requirements of this section, unless otherwise specified on the plans or in the special provisions. The following descriptions apply to the TNEMEC system for primers, and top

coat coating profile. Other systems shall be accepted if proven to be equal or better than the system specified in this section.

Coating	Description
90-97 Tneme-Zinc:	
Zinc-Rich organic moisture cured	A two-component moisture cured urethane primer zinc-rich primer, used in conjunction with chemical and corrosion resistant top coats. When used as a shop primer, may be recoated the same day. Conforms to SSPC-PS 12.01.
Endura-Shield III Series 73:	
High build acrylic polyurethane	A high-solids, high-build, fast-drying coating that is highly resistant to abrasion, corrosive fumes and chemical contact. Can be applied in a single coat directly to properly applied organic zinc-rich primers and other compatible coatings without the use of an intermediate or tie coat. Provides long-term color and gloss retention.

2.3 Material Preparation

A. Do not use any material older than the manufacturer's recommended shelf life.

B. Mix and thin materials according to manufacturer's latest printed instructions.

C. Do not use mixed materials beyond manufacturer's recommended pot life.

2.4 Paint System

Unless specified in the plans or special provisions, it is understood that the coating application for primers, intermediate coats and top coats received shall be as recommended by the manufacturer. The minimum acceptable thickness is that enclosed in the parenthesis.

A. System – 1 Produced by TNEMEC

Primer- 9097 Tneme-Zinc

SURFACE PREPARATION (SSPC-SP6)	Commercial Blast Cleaning
COLOR	Reddish-Gray

METALLIC ZINC CONTENT	83% by weight in dry applied film
SOLID BY VOLUME	63.0% ±2.0% (Mixed)
THEORETICAL COVERAGE	1003 mil sq. ft. per gallon
DRY FILM THICKNESS	2.5 to 3.5 mils per coat
CURING TIME	At 75°F To handle: 1 hour To recoat: 4 hours
TEMPERATURE RESISTANCE	(Dry) Continuous 250°F Intermittent 300°F
SPECIAL QUALIFICATIONS	This product meets the requirements of the United States Department of Agriculture for use in federally inspected meat and poultry processing plants

Intermediate Coat – (None applicable with this system)

Top Coat - Series 73 Endura Shield III

SURFACE PREPARATION	Prepare surfaces by method suitable for exposure and surface (see prime coat data). All surfaces must be dry and clean.
COLORS	Refer to Tnemec CHROMACOLORS
FINISHES	Semi-gloss
SOLIDS BY VOLUME*	58.0 + 2.0% (Mixed)
THEORETICAL COVERAGE*	930 mil. sq. ft. per gallon
DRY FILM THICKNESS	3.0 to 5.0 mils per coat
CURING TIME - AT 75oF	To touch: 1 hour To handle: 5 hours To recoat: 12 hours To resist moisture condensation: 3 to 6 hours
TEMPERATURE RESISTANCE	(Dry) Continuous 170oF. Intermittent 200ºF
MIXING RATIO	By volume-Four (Part A) to One (Part B)

CHEMICAL RESISTANCE	Organic Acids Mineral Acids Oxidizing Agents Alkali Solutions	
FREQUENT CONTACT	Alcohols Aliphatic Hydrocarbons Aromatic Hydrocarbons Salt Solutions Ketones	Fresh Water Waste Water Mineral Oils Vegetable Oils

*Values may vary with color.

2.5 Performance Criteria

This product shall meet or exceed the following test requirements
90-97 Tneme-Zinc
Type: Zinc-rich Urethane Primer

Adhesion

Method:	Elcometer Adhesion Tester (0 to 1,000 psi). Coating applied to sandblasted steel panels and cured 7 days at 77°F./50% R.H.
System:	90-8 One-Coat 90-97 Tneme-Zinc.
Requirement:	Not less than 800 psi pull, average of three trials.
Method:	ASTM D 3359 (Method B). Substrate: 4-inch x 12-inch x 1/8inch steel panels.
Surface Preparation:	SSPC-SP10.
System:	90-8 One-Coat 90-97 Tneme-Zinc cured 7 days at 77oF./50% R.H.
Requirement:	No less than a rating of 5, average of three trials.

Salt Spray (Fog)

Method:	ASTM B117-73. System: 90-8 One-Coat 90-97 Tneme-Zinc.
Requirement:	No blistering, cracking, softening or delamination of film. No rust creepage at scribe and no rusting at edges after 3,000 hours of exposure.
Method:	ASTM B 117-73.

System: 90-97 Tneme-Zinc/Series 73

Endura-Shield III.

Requirement : No blistering, cracking, softening or delamination of film. No more than 1/16-inch rust creepage at scribe and no rusting at edges after 3,000 hours of exposure.

Series 73 Endura-Shield III

Type: High-Build Acrylic Polyurethane Enamel

Abrasion Resistance: Federal Test Method Std. No. 141, Method 6192, CS-17 Wheel, 1,000 gram load. No more than 95 mg. loss after 1,000 cycles.

Adhesion: ASTM D 3359 Method B (Crosshatch Adhesion). Coating systems applied to sandblasted steel panels and cured 30 days @ 77°F. Not less than a rating of 5, average of three tests.

Humidity: ASTM D 2247-68. No blistering, cracking, softening or delamination of film after 600 hours exposure.

Salt Spray: ASTM B 117-73. No blistering, cracking, softening or delamination of film. No rust creep age at scribe and no more than one percent rusting at edges after 1,000 hours exposure.

PART 3 - EXECUTION

3.1 Inspection

Refer to Section 09900 - PART 3.1

A. Make visual comparison of cleanliness or prepared surfaces with pictorial standards in accordance with SSPC-VIS-1.

B. Measure dry film thickness using a magnetic film thickness gage in accordance with SSPC-PA2.

3.2 Surface Preparation

All surfaces of new or existing structural steel or other metals to be painted shall be blast cleaned unless otherwise specified in the special provisions, or approved in writing by the Engineer.

In repainting existing steel structures the method of cleaning shall be specified in the special provisions. Any damage to sound paint on areas not designated for treatment, resulting from the Contractor's operations shall be repaired by him at his expense to the satisfaction of the Engineer.

3.3 Blast Cleaning

Surfaces prepared by Commercial Blast Cleaning shall be in accordance with SSPC-SP6. The blast cleaning shall remove all rust, mill scale and other substances down to bright metal. Special attention shall be given to cleaning of corners and reentrant angles. Before painting, sand adhering to the metal in the corners and elsewhere shall be removed. The cleaning shall be approved by the Engineer prior to any painting. Bare metal shall be prime painted as soon as practicable after it is cleaned. All surface shall be primed the same day they are blast cleaned. Any reblasted that is required shall be done by the Contractor at his expense.

Abrasive used for blast cleaning shall meet all local state and federal specifications, regulations and laws to produce satisfactory results. The Anchor Pattern on the blast surface shall not exceed 1 1/2 to 2 mils.

3.4 Disposal and Removal of Lead Primer

All lead base primer shall be blasted off the structure, in accordance with OSHA (Occupational Safety and Health Administration) health and safety regulations. The regulations are outlined in the code of federal regulations section 1910.1025 “Lead”.

The Contractor shall have all testing required by regulations or by the selected waste hauler or landfill, such as Toxicity Characteristic Leaching Procedure Testing (TCLP Testing), or subsequent testing required by the Resource Conservation and Recovery Act (RCRA) or local or state regulations, to determine proper treatment and/or disposal requirements, including any follow-up testing, shall be done at the Contractor's expense. The Cost of all disposal on shall be paid for by the Contractor. Copies of all manifests, testing results and treatment procedure documents as shall be sent to the County.

The citizen and environmental protection shall conform to all Local, State and Federal specifications, regulations, and laws governing the removal of lead paint. Each site shall be reviewed for compliance with environmental and industrial containment standards and safe guards.

List of Agencies to contact:

Occupational Safety and Health Administration (OSHA)	(202) 523-9655
Environmental Protection Agency (E.P.A.)	(202) 260-4134

Water Pollution (Arlington County)	(703) 228-6820
Environmental Health (Arlington County)	(703) 228-4826
Hazardous Waste Violation, Health Dept. (VA)	(804) 225-2667
VA. State Air Pollution Control Board	(703) 644-0311

3.5 Notification

The Contractor shall notify the Engineer in writing, at least one week in advance of the date that cleaning and painting operations are to begin.

3.6 Coating Schedule

First coat: Series 90-97 Tneme-Zinc at 2.5 - 3.5 dry mils. (Note: two coats of primer applied to severely rusted areas, bolts, bearing areas, pitted areas at a minimum of 2 feet from beam end as determined by the Engineer. Brush apply first full coat forcing material into these areas).

Second coat: Series 73 Endura-Shield III at 3 - 5 dry mils.

3.7 Method

Painting shall be done in a neat and workmanlike manner. Unless otherwise specified, paint shall be applied by conventional air spray, airless spray brush or any combination thereof. Refer to the manufacturer's recommendation on the application of their painting system.

A. Apply a smooth, uniform coat, free of any skips, holidays, runs, sags, dry spray or any other film defects. Correct the deficiencies before the succeeding application.

B. On all surfaces that are inaccessible for painting by regular means, the paint shall be applied by sheep skin daubers, bottle brushes or any means approved by the Engineer.

C. Do not apply successive coats until the Engineer has completed inspection. Succeeding coats shall be applied within the following 24 hours. A minimum of
30 minutes shall elapse between applications or as specified by the manufacturer. Refer to the manufacturer's specification on application of succeeding coats.

3.8 Curing

Allow the prime coat to cure a minimum of 12 hours, or as specified by the manufacturer, before top coating.

The top coat shall be applied within 24 hours, or as specified by the manufacturer, to minimize contamination.

Refer to the manufacturer's recommendations or curing time for their brands of paints.

3.9 Field Painting

Surfaces which shall be inaccessible after erection shall be cleaned free from any foreign material and painted prior to erection with such field coats as are called for on the plans or specified in the special provisions or authorized by the Engineer. Field painting, except for retouching, shall be performed only after all form work, such as concrete, is completed and the forms removed. When the paint applied for retouching has thoroughly dried, such field coats as called for on the plans or authorized shall be applied. However, no coat of paint shall be applied until the preceding coat has dried. Paint shall be considered dry when another coat can be applied without the development of any film irregularities.

To secure a minimum coating on edges of plates or shapes, bolt heads and nuts and other parts subjected to special wear and attack, the edges, shall first be stripped with a longitudinal motion and the bolt heads and nuts with a rotary motion, followed immediately by the general painting of the whole surface, including the edges and bolt heads nuts.

If traffic produces an objectionable amount of dust, the Contractor shall allay the dust for the necessary distance on each side of the structure and take any other precautions necessary to prevent dust and dirt from coming in contact with freshly painted surfaces or with surfaces before the paint is applied.

The second field coat shall not be applied in less than 2 days after the first field coat. The application of the final field coat shall be deferred until after all construction operations which might mar the finished coat are complete.

The Contractor shall protect adjacent property and pedestrian, vehicular and other traffic upon or underneath the structure and also all portions of the superstructure and substructure against damage or disfigurement by the painting operation.

PART 4 - MEASUREMENT AND PAYMENT

Preparing and painting of structural steel shall be measured by the square foot or as noted. Measurement shall be determined along the surface of the actual area painted. Payment shall be per square foot for preparing and painting structural steel and shall include full compensation for furnishing all labor, materials, tools, equipment, disposing and incidentals, and for doing all the work involved in preparing the steel and applying the paint to the surfaces as shown on the plans, specified in these specifications and the special provisions, and as directed by the Project Officer.

PART 1 - GENERAL

1.1 Description of Work

Provide all plant, labor, material and equipment to treat piles, structural and miscellaneous timber called for on the approved plans.

1.2 Related Work Specified Elsewhere

Section 06100 - Structural Timber & Lumber
Section 09900 - Protective Coatings

1.3 Applicable Specifications

A. American Association of State Highway Transportation Officials (AASHTO)

B. Virginia Department of Transportation, Road and Bridge Specifications(VDOT)

1.4 Applicable Reference

American Wood Preserver's Association (AWPA)

1.5 Quality Assurance

Provide certified test reports as required by AASHTO M-133.

PART 2 - MATERIALS

2.1 Materials shall conform to Section 236 of the VDOT Specifications.

PART 3 - EXECUTION

3.1 Preparation, treatment and penetration shall conform to Section 236 of the VDOT Specifications.

PART 4 - MEASUREMENT AND PAYMENT

No separate measurement and payment shall be made for this work. It shall be considered a subsidiary obligation of the Contract under other work to which it relates.

PART 1 - GENERAL

1.1 Description of the Work

Provide all labor, materials and equipment for the complete application of protective coatings for interior and exterior surfaces as required in accordance with these specifications and where called for on the approved plans.

1.2 Related Work Specified Elsewhere

Section 09800 - Wood Preservatives

1.3 Applicable Specifications

A. American Society for Testing and Materials (ASTM)

B. Steel Structures Painting Council (SSPC0)

1.4 Surfaces Not to be Painted

The following surfaces are not to be painted. (If surfaces referenced below are to be coated, specific instructions shall be given on the approved plans.)

A. Non-ferrous metals; for example - Aluminum Copper Monel Brass
B. Stainless Steel
C. Chain link fencing
D. Concrete walks, curbs
E. Exterior concrete foundations
F. Plastic
G. Brick
H. Galvanized steel

1.5 Submittals

In accordance with Section 03100, submit a complete list of materials and color charts. The Engineer shall select colors.

1.6 Quality Assurance

A. Primers, intermediate and top coats for each surface shall be supplied by one manufacturer.

B. Thinner, solvents, cleaning compounds shall comply fully with the recommendations of the coatings manufacturer.

C. The protective coating systems shall be tested and inspected for acceptance in accordance with Part 3.

1.7 Product Delivery, Storage and Handling

Deliver painting materials to the site in the original manufacturer's containers with labels intact and seals unbroken. Store materials in an area specifically assigned for storage. Storage area shall be well ventilated and kept locked. Keep storage area clean. Remove oily rags daily and dispose same properly. Take all necessary precautions to avoid fires.

1.8 Guarantee

Protective coatings shall be guaranteed for a period of one year after acceptance of the project by the County. Approximately one month prior to the expiration of this guarantee period, the Engineer shall notify the Contractor to coordinate inspection of the coatings. All coatings for the project shall be inspected and failures repaired at no cost to the County. Normal wear, abrasion, or physical damage as determined by the Engineer shall not be considered as failures.

PART 2 - MATERIALS

2.1 Acceptable Manufacturers

The protective coating systems specified under this section are generic in form. The systems are manufactured by a number of acceptable manufacturers, no one of which can provide all of the systems for this contract. Manufactures are required to meet the requirements herein.

2.2 Paint Materials

The following descriptions apply to the short form identifications of the primers, intermediate and top coats specified under the various systems of paragraph 2.3 following. Other acceptable coatings of the above named manufacturers exist, but have not been defined herein.

Coating	Description
Coal Tar - Black	High build coal tar solution containing 65% solids by volume.
Coal Tar Epoxy-White	High build 2-component white coal tar epoxy coating having a minimum epoxide resin content of 34% by weight in the weight
Epoxy - Polyamide	Two component Polyamide epoxy containing 55% solids by volume. With exposure at 45o facing ocean exhibit no blistering, cracking delamination after 36 months' exposure. Exhibits no more than 130 mg. loss after 100 grams load of Federal Test Method Std. No. 141 Method 6192.
Eproxy-Primer - Red	Two component polyamide epoxy containing a minimum of 53% solids by volume having performance equal to the epoxy-polyamide above.
Modified Epoxy	High build decorative sand texture finish suitable for use on new and previously painted concrete and masonry and having 50% minimum solids by volume. When subject to ASTM D-2247 test for humidity shall exhibit no blistering, softening, or loss of film integrity, or change in color after 1,000 hours.
Polyurethane Enamel	Two component aliphatic polyurethane highly-resistant to abrasion; corrosive fumes, moisture and chemical contact and containing a minimum of 50% solids by volume. Shall show no blistering, cracking, softening or delamination of film after 5,000 hours' exposure (ASTM D-2247 humidity) and shall meet the abrasion and gloss test of the polyurethane aliphatic-1.

2.3 Paint Systems

Unless specified otherwise, it is understood that each stage of coating (primer, intermediate and top) receives only 1 coat. Note that the dry film thicknesses specified denotes the average. The minimum acceptable for the thickness tests are noted in parenthesis ().

A. Concrete and Masonry

1. System “A-1”

Interior – Immersion

Primer	
Epoxy-Polyamide	5.0 mils d.f.t.
	(4.0 mils minimum)

FINAL COAT	
Polyurethane Enamel	2.0 mils d.f.t.
Semi-gloss (color)	(1.5 mils minimum)

2. Systems "A-4"

Interior - Immersion or Non-immersion - Storm or Sewer Structures when specifically called for on the approved drawings.

1 COAT

Coal Tar Epoxy – White	22.0 mils d.f.t.
	(20.0 mils minimum)

3. System "A-3"

Interior Walls or Exterior Walls Above Grade

FINISH COAT

Modified Epoxy	10.0 mils d.f.t. (8.0 mils minimum)

4. System "A-5"

Exterior Walls to be Backfilled

PRIMER

Coal Tar - black	15.0 mils d.f.t.

FINAL COATS

Coal Tar - black	15.0 mils d.f.t.
Total:	30.0 mils d.f.t.
	(27.0 mils minimum)

B. Steel and Iron

1. System "B-1"

Non-Immersion - Severe Corrosive Condition

PRIMER

Epoxy - Polyamide	5.0 mils d.f.t.
(semi-gloss)	(4.0 mils minimum)

TOP COAT

Polyurethane Enamel	2.0 mils d.f.t.
(semi-gloss - color)	(1.5 mils minimum)

2. System "B-2"

Non-Immersion - Mild Corrosive Condition

PRIMER

Epoxy Primer - Red	4.0 mils d.f.t. (3.0 mils minimum)

TOP COAT

Epoxy - Polyamide	5.0 mils d.f.t. (4.0 mils minimum)

C. Wood

1. System "C-1"

All Exposures

PRIMER AND TOP COAT

Epoxy - Polyamide - 2 coats	2.5 mils d.f.t.(2.0 mils min.) each coat

2.4 Galvanizing

A. All exterior and/or interior steel work, where indicated on the Contract Documents, shall be galvanized by the hot-dip process, conforming to ASTM A-386 for assembled steel products. All required hot-dip galvanizing shall be done after fabrication, in the largest sections possible. Items too large for available dip tanks shall be sprayed, by approved methods, with molten zinc to coating thickness of .003 inch to .004 inch.

B. Weight of zinc coating per square foot of actual surface shall average not less than 2.0 ounces and no individual specimen shall show less than 1.8 ounces.

C. All bolts and screws for attachment of galvanized items shall be galvanized or non-corrodible material.

PART 3 - EXECUTION

3.1 Inspection

A. Complete records shall be kept by the Contractor and furnished to the Engineer. These records shall identify the particular paints that were applied to a surface, the date of application, area coated, climatic conditions, and the following post application quality control data:

1. Wet film thickness: 3 readings per 100 sq. ft.
2. Dry film thickness: 1 reading per 250 sq. ft.

B. Repair all damaged coated areas, holidays and thickness test areas in accordance with the coating manufacturer's recommendations so that the repaired area is equal to the undamaged coated areas in all respects.

3.2 Surface Preparation

All surfaces to be coated shall be cleaned, free of harmful scale, rust, dirt, oil, grease, moisture, concrete mortar, loose and damaged coatings and all foreign matter.

A. Concrete:

Concrete shall be fully cured prior to coating. Fully cured shall be defined as 28 days at75^{o}F or 49 days at 50°F or 53 days at 50°F. Rebuild rough, chemically attacked and/or abraded surfaces. Rebuild concrete surfaces containing air, water pits, splatter, fins, protrusions, bulges, or other surface irregularities while the concrete is still ”green”.

B. Steel and Iron:

1. Remove all weld splatter. Grind all edges, projections, sharp corners and welds to a smooth, rounded contour.

2. Remove oil and grease from surfaces by solvent cleaning in accordance with the Steel Structures Painting Council Specifications (SSPC).

3. Abrasive blast steel and iron surfaces in accordance with SSPC-SP-20 (Near-White Blast).

4. In areas where blasting is not feasible, obtain the approval of the Engineer to use power tool cleaning in accordance with SSPC-SP-3.

5. Remove dust and spent sand from the surfaces after sand blasting by brushing and vacuum cleaning.

6. Apply the prime coat as soon as possible after the preparation is complete and before the dew point is reached. All surfaces blasted and power-tooled in one day shall be coated on the same day. Leave whipblast or power tool areas exposed overnight.

C. Galvanized Steel Surfaces:

Conform to ASTM A-384 and A-385 (Recommend Practices) pertaining to galvanizing assembled steel products. Unless otherwise permitted, do all galvanizing after fabrication, in largest sections practicable. Where galvanizing is removed by welding or other assembly procedure, touch up abraded areas with molten zinc or zinc-rich paint.

D. Concrete or Cinder Block:

Concrete or cinder block substrates shall be clean, dry and free of oils and release agent contaminants. If necessary, spot clean with solvent and wash with strong detergent and warm water. Flush with high pressure water and allow to dry for approximately one hour before application.

E. Brick:

Clean off all mortar, uneven loose or detrimental foreign matter. Apply a cleaning compound approved by the coating manufacturer. Allow to stand on the brick for at least 15 minutes. Thoroughly remove the cleaning compound by high pressure spray delivering 1 to 3 gpm at 1,000 psig. Allow to dry for at least one hour and paint as soon as possible after drying.

F. Wood:

Maintain the surface in a clean and dry manner. Fill cracks and nail holes with putty after the first coat has been applied. Seal knots and sap streaks with material approved by the manufacturer. Sand surfaces to a fine smooth finish.

3.3 Application

A. Mix all paint and tinting colors in strict accordance with the specifications of the paint manufacturer. Except for epoxies, mix paints at storage area and deliver to the site ready-mixed.

B. Apply coatings uniformly and in a continuous film by brush or spray, leaving no sags, holidays, pinholes, bubbles or other defects. Coatings judged unsatisfactory by the Engineer's representative shall be corrected at no additional cost to the County.

C. Do not apply paint when the surrounding air temperature, as measured in the shade, is below 50°F or less than 5°F above the dew point. Do not apply paint to wet or damp surfaces or when the humidity exceeds 85%.

D. Vary the colors of successive coats.

E. Do not apply successive coats until the Engineer has completed inspection.

F. All shop galvanized steel work necessitating field welding which in any manner removes original galvanizing shall be restored by field cold galvanizing with “Ferraloy”, “Tin Easy Fluid”, “'galvaloy”, or approved equal.

PART 4 - MEASUREMENT AND PAYMENT

No separate measurement and payment shall be made for this work. It shall be considered a subsidiary obligation of the Contract under other work to which it relates.

PART 1 - GENERAL

1.1 Description of the Work

Provide all labor, material and equipment to furnish and install, complete in place, the bus shelter in accordance with these specifications and to the lines, grades and dimensions shown on the approved plans.

1.2 Related Work Specified Elsewhere

Section 02611 - Concrete Walks and Concrete Driveway Entrance
Section 02612 - Interlocking Concrete and Brick Pavers
Section 03100 - Concrete Formwork, Reinforcement and Materials
Section 09900 - Protective Coatings

PART 2 - MATERIALS

2.1 Bus Shelter Unit

The bus shelter shall be either an Arlington County type or a Metro type bus passenger shelter as specified on the plans. The Metro type bus shelter shall be provided by Washington Metro Area Transit Authority (WMATA). The Arlington County bus shelter shall be furnished by the Contractor, unless otherwise specified on the approved plans.

2.2 Paint

Paint for the Metro shelter shall be custom blend, Metro Brown, available from MAB Paint Co., 3312 Wisconsin Ave. NW, Washington, DC, Phone: (202) 966-5445.

2.3 Concrete Pad

The concrete pad and aggregate base shall be in conformance with Section 02611 of these specifications.

2.4 Pavers

Pavers when specified on the approved plans, shall match the adjacent sidewalk and be as specified in Section 02612 and on the plans.

PART 3 – EXECUTION

3.1 The Contractor is responsible for the pick-up and delivery of the Metro passenger shelter unit from the Washington Metropolitan Area Transit Authority. Three weeks prior to installation, contact the Arlington County,

Department of Environmental Services, Planning Division at 228-3681 to arrange for pick-up and directions.

3.2 The unit is to be mounted on a 4-inch thick concrete pad on a 3-inch compacted aggregate base. Construct concrete pad in accordance with Section 02611. When pavers are specified on approved plans, lay pavers in accordance with Section 02612. Match elevation of pavers or concrete pad with adjacent sidewalk and provide 1/4-inch/ft positive drainage to street. Extend anchor bolts from concrete base pad through pavers to mount on shelter brackets.

3.3 Install bus shelter in accordance with the approved plans and the details provided in these specifications.

3.4 Paint the Metro bus shelter in accordance with Section 09900 and manufacturer's application instructions.

PART 4 - MEASUREMENT AND PAYMENT

Bus shelters shall be measured as each. Payment shall be at the unit price stated in the bid proposal and shall include all materials, labor and incidentals necessary for a complete installation of the bus shelter unit and the supporting concrete pad.

PART 1 – GENERAL

This work shall consist of maintaining and protecting workers, vehicular and pedestrian traffic through areas of construction within the limits of the project and over the approved traffic detours. All work shall be in accordance with the latest Arlington County Construction Standards and Specifications, Virginia Department of Transportation (VDOT) Road and Bridge Specifications, the Manual on Uniform Traffic Control Devices (MUTCD), and the Virginia Work Area Protection Manual (WAPM), the standard drawings, and the Contract, as directed by the Project Officer.

1.1 Description of Work

Provide all plant, labor, supervision, materials, and equipment to install, maintain, relocate, and remove all temporary traffic control devices.

1.2 Related Work Specified Elsewhere

1.3 Applicable Specifications

A. Virginia Department of Transportation (VDOT)
B. VDOT Road and Bridge Specifications
C. Manual on Uniform Traffic Control Devices (MUTCD)
D. Virginia Work Area Protection Manual (WAPM)
E. Occupational Safety and Health Act, State & Federal (OSHA)

1.4 Quality Assurance

Work Zone Traffic Control Certification

The Contractor shall have at least one (1) employee who is certified by VDOT in Basic Work Zone Traffic Control; and who shall be responsible for the placement, maintenance and removal of work zone traffic control devices within the project limits in compliance with the permit requirements and conditions, the approved plan, specifications, the Virginia Work Protection Manual and the Manual of Uniform Traffic Control Devices. An Employee certified by VDOT in the Intermediate Work Zone Traffic control shall be on-site to provide supervision during work zone adjustments or changes to traffic control due to field conditions. This employee shall provide evidence of this certification upon request from Arlington County personnel.

PART 2- MATERIALS

2.1 General

Material shall conform to the requirements of the applicable VDOT specification.

2.2 Signalization, Barricades, Channelizing Devices, Safety Devices, and Pavement Markings

Signalization, barricades, channelizing devices, safety devices, and pavement markings shall

conform to the requirements of Division VII of the latest VDOT specifications and the MUTCD.

2.3 Temporary Pavement Markers

Temporary pavement markers shall conform to the requirements of VDOT Section 235, Retroreflectors.

2.4 Construction Pavement Markings

Construction pavement markings shall conform to the requirements of VDOT Section 231 (Paint), and Section 246 (Pavement Marking).

2.5 Portable Changeable Message Signs

Portable changeable message signs shall meet the requirements of Section 512.03 subsection q of the VDOT Road and Bridge Specifications.

PART 3- EXECUTION

This section shall conform to the VDOT Specification Section 512.03.

PART 4- MEASUREMENT AND PAYMENT

Payment for MOT shall be based on the bid form. Payment for maintenance of traffic is full compensation for providing the proper pedestrian and vehicular traffic controls during all stages of construction and includes furnishing, preparing, fabricating, installing, maintaining, removing, relocating, repairing, or replacing pedestrian and vehicular traffic control devices and signs as necessary, and all other materials, labor, hardware, equipment, tools, supplies, and incidentals. Contractor shall be responsible for acquiring VDOT permit for any revision during construction and/or as required by the project contract to the approved traffic control plan.

Payment for maintenance of traffic for each site shall be made as partial payments. The first installment of 50 per cent of the total cost for maintenance of traffic shall be made on the first progress estimate following partial mobilization and initiation of construction work for the particular site. The remaining 50% of the cost shall be paid on each subsequent estimate based on the percent of work completed at the site all the way through Final Acceptance of work. The Project Officer shall have the authority to decide on the appropriate payment for each subsequent estimate.

PART 1 - GENERAL

1.01 SUMMARY

A. This Section includes the following:

a. Protection of existing trees to remain:

i. Pruning of existing trees roots that are affected by execution of the Work, whether temporary or permanent construction.
ii. Aeration and Root Protection Matting
iii. Tree Protection Fencing

PRODUCT DATA SHEET 1 - Provide all labor, materials, tool and equipment as required to have tree protection applied on all areas called for on plans.

PRODUCT DATA SHEET 2 - In addition to the specifications contained herein, Work shall be performed in accordance with the Arlington County Department of Parks & Recreation Design Standards for Tree Protection and Trimming as shown on plans and available online on the Arlington County Website

PRODUCT DATA SHEET 3 - Related Sections:

a. 02200 Earthwork

b. 02100 Clearing and Grubbing

c. 01500 Erosion and Sediment Control and Pollution Prevention

d. 329000 Exterior Plants

e. 329200 Seeding and Sodding

1.02 DEFINITIONS

A. Finish Grade: Elevation of finished surface of planting soil.

B. Imported Topsoil: Soil obtained off-site that meets the specifications herein for topsoil and is suitable for use in planting soil/backfill soil mixture when existing soil quantities are insufficient. Refer to Section 329100 “Planting Preparation.”

C. Planting Soil/Backfill Soil Mixture: Existing soil modified as specified to be suitable for planting. Refer to Section 329100 “Planting Preparation.”

D. Subgrade: Surface or elevation of subsoil remaining after completing excavation, or top surface of a fill or backfill, before placing planting soil.

E. ISA: International Society of Arboriculture

F. CBAY: Chesapeake Bay, typically referring to CBAY watershed.

G. Urban Forester/County Urban Forester: Refers to the Arlington County Urban Forester

H. Landscape Architect: Refers to an Arlington County Landscape Architect or their designee.

1.03 SUBMITTALS

A. Product Data: For each type of product indicated in Section 2.0

B. Certification: From Contractor's arborist, certifying that trees indicated to remain have been protected during construction according to recognized standards and that trees were promptly and properly treated and repaired when damaged.

C. Maintenance Requirements: From Contractor's arborist, for care and protection of trees affected by construction during and after completing the Work.

D. Contract arborist Qualifications: Contractor shall submit a copy of valid ISA certification to the Project Officer for approval with confirmation by Urban Forester.

E. List products to be used and firms, including qualifications to perform work.

F. Provide schedules for performance of work.

1.04 QUALITY ASSURANCE

A. Contractor shall ensure that tree and plant protection methods are implemented by an arborist Certified by the International Society of Arboriculture (ISA) to provide for the care of the trees and plants impacted by construction activities. Provide ISA certification verification to Project Officer per section 1.03 "Submittals" prior to beginning work.

B. The Contractor shall identify to the Project Officer at least one authorized on-site Point of Contact(POC) who is, by training or experience, familiar with the policies, regulations and standards applicable to the work being performed. The POC and the certified arborist may be the same individual.

C. Crews shall be directly supervised by an ISA certified arborist.

D. All workers, through related training and on the job experience, shall be familiar with the technical aspects of arboricultural work and equipment used in such operations.

E. Trucks and mechanized equipment shall not enter tree protection areas.

F. Stump grinding shall be with small machines specifically designed for that purposes. No stumps shall be excavated except as described herein. Stumps shall be ground not more than 8” below grade and care must be taken to minimize damage to root of the trees to remain.

G. No stump grinding within tree protection areas.

H. All work in or near tree protection areas shall be carefully performed by Contractor in order to avoid damage to tree trunks, branches, root system, and other existing plant materials and soils that are to remain.

I. Silt shall not be allowed to collect in preservation or reforestation areas. Silt accumulating in preservation areas shall constitute damage and shall require remedial activity. All silt shall be removed from preservation areas within 24 hours of siltation. The methods and procedures for silt removal within tree preservation and reforested areas shall be approved by the Project Officer with confirmation by the Urban Forester.

J. Tree Pruning Standard: Comply with ANSI A300 (Part 1), "Tree, Shrub, and Other Woody Plant Maintenance--Standard Practices (Pruning)."

   a. Pruning shall remove only dead, dying, damaged or broken limbs greater than 1” – 1.5” in diameter.

   b. Pruning for clearance shall be reviewed and approved by Project Officer with confirmation by the Urban Forester.

K. Urban Forester Notification: The Contractor shall notify the Project Officer 72 hours prior to the following events, so that the County’s Urban Forester can be notified and present at a pre-construction site meeting (refer to Section 3) and to observe work:

   a. Tree protection fencing installation
   b. Tree or root-pruning operations.

   c. Work within tree protection zones.

   d. Tree planting.

PART 2 - PRODUCTS

2.01MATERIALS

A. Temporary Tree Protection Fence: Unless otherwise indicated in approved plans, tree protection fence shall be two-inch wire mesh fabric measuring 72 inches in height mounted on 1.9" O.D. steel pipes driven 24 inches into the ground, placed 120 inches on-center maximum. Refer to Arlington County DPR standard detail on approved plans.

B. Tree Protection Signs: Shall be of heavy-duty sheet aluminum or weatherproof plastic material measuring 12 inches by 18 inches. Signs shall state "NO ENTRY, TREE PROTECTION AREA, CALL 703-228-6557 TO REPORT VIOLATIONS" in both English and Spanish. Signs shall be mounted on fence every 50 feet maximum.

C. Topsoil: Refer to Section 329100 – Plant Preparation.

D. Bark Mulch: Refer to Section 329100 –Plant Preparation

E. Temporary Root Protection Matting: If required in approved plans, temporary root protection matting shall be a double-sided geocomposite, geonet core, non-wove covering such as Tendrain 770-2, as manufactured by Tenax Corporation, Baltimore, MD or approved equal. Six (6) inches of wood chip mulch shall be applied to area to receive root protection matting prior to installation. Matting shall be installed in a single layer.

F. Landscape nails: When required, spikes shall be 12" as indicated on the drawings.

PART 3 - EXECUTION

3.01 PREPARATION

A. Prior to the construction activities, the Contractor shall meet on-site with the Project Officer and Urban Forester to review trees to remain and protective measures required.

B. Temporary Tree Protection Fencing: Install temporary tree protection fencing and signs around tree protection zones to protect remaining trees and vegetation from construction damage. Maintain temporary fence and remove when construction is complete after approval by Project Officer with confirmation by the County Urban Forester.

C. Protect tree root systems from damage caused by runoff or spillage of noxious materials while mixing, placing, or storing construction materials. Protect root systems from ponding, eroding, or excessive wetting caused by dewatering operations.

D. No personnel, vehicles, equipment, construction materials, or construction debris shall be allowed inside the tree protection areas at any time during construction without the written

E. consent of the Project Officer with confirmation by the Urban Forester. If a violation is observed, the Contractor shall be notified by the Project Officer and shall

immediately rectify the situation. Continued and subsequent violations shall result in a fine of $500 per day of violation.

F. Special Demolition Procedures:

a. Demolition of walks and hardscape within tree protection areas shall be directly supervised by an ISA certified arborist.

b. Mechanized equipment shall not enter tree protection areas (TPAs) or reforestation areas.

c. Backfill of voids created by demolition within the TPAs and reforestation areas shall be loosely placed topsoil. Only the amount of topsoil necessary to fill the void without spreading over existing grades shall be allowed.

3.02 EXCAVATION

A. Install shoring or other protective support systems to minimize sloping or benching of excavations if indicated in the approved plans.

B. Do not excavate within tree protection zones, unless otherwise indicated.

C. Where utility trenches are required within tree protection zones, Contractor shall perform root pruning prior to trenching.

D. Where excavation is proposed within the critical root zone of trees to remain, Contractor shall perform root pruning as indicated in approved plans prior to excavation.

E. Where new finish grade is indicated below existing grade around trees, Contractor shall slope grade outside of tree protection zones. Maintain existing grades within tree protection zones.

3.03 ROOT PRUNING:

A. When required, root pruning locations shall be indicated on the approved plans. Exact location and depth shall be determined on site with Project Officer and Urban Forester during the pre-construction meeting.

B. Do not cut main lateral roots or taproots; cut only smaller roots that interfere with installation of utilities. Cut roots with clean, sharp pruning instruments; do not break or chop. All root pruning shall be performed by an ISA certified arborist. Refer to Arlington County Department of Parks & Recreation Design Standards “Tree Protection and Trimming” as shown on plans and available online at:

http://parks.arlingtonva.us/design-standards/

3.04 TREE REPAIR AND REPLACEMENT

A. Promptly repair trees damaged by construction operations within 24 hours. Treat damaged trunks, limbs, and roots according to Arlington County Urban Forester or contract arborist's written instructions.

B. The Contractor shall be responsible for any damage to trees within the Tree Protection Area caused by the Contractor's personnel, vehicles, or equipment at the site. Any damage to a tree to remain shall result in a payment by the Contractor to the Project Officer for the amount of damage based on the latest edition of the Council of Tree and Landscape Appraisers Guide for Plant Appraisal published by the International Society of Arboriculture (ISA). All trees are to be valued as landscape trees.

3.05 DISPOSAL OF WASTE MATERIALS

A. Burning is not permitted.

B. Disposal: Remove excess excavated material and displaced trees from Owner's property and legally dispose.

PART 4 – MEASUREMENT AND PAYMENT

4.1 The measurement of TREE PROTECTION FENCE shall be for LINEAR FOOT of fence including all appurtenances as delivered to the site, furnished, installed, maintained and removed at project completion in accordance with the plans and specifications.

4.2 The unit price for Tree Protection Fence shall include the cost of all labor, materials, equipment and incidental expenses necessary to complete the work.

4.3 The measurement of ROOT PRUNING shall be for LINEAR FOOT of root pruning performed on the project in accordance with the plans and specifications.

4.4 The unit price for ROOT PRUNING shall include the cost of all labor, materials, equipment and incidental expenses necessary to complete the work.

4.5 The measurement of ROOT PROTECTION MATTING shall be for SQUARE FOOT of matting as delivered to the site, furnished, installed, maintained and removed at project completion in accordance with the plans and specifications.

4.6 The unit price for ROOT PROTECTION MATTING shall include the cost of all labor, materials, equipment and incidental expenses necessary to complete the work including anchor/landscaping nails, in accordance with the approved plans and specifications. Unless otherwise specified on the approved plan, excavation for ROOT Protection Matting installation is considered incidental to the work and shall not be paid separately.

PART 1 - GENERAL

1.01 SUMMARY

A. This Section includes erosion control materials, soil amendments, mulching and topsoil.

B. Provide all labor, materials, tools and equipment as required to have topsoil, planting soil mix, soil stabilization, amendments, and mulch applied per the specifications on all areas disturbed by construction to receive plant materials as indicated in the approved plans.

C. Related Sections:

a. Section 02200 Earthwork

b. Section 02100 Clearing and Grubbing

c. Section 311300 Tree Protection and Root Pruning

d. Section 01500 Erosion and Sediment Control and Pollution Prevention

e. Section 329200 Seeding and Sodding

f. Section 329300 Exterior Plants

D. In addition to the specifications contained herein, Work shall be performed in accordance with the:

a. Drawings and general provisions of the contract, including general and supplementary conditions

b. Arlington County Department of Parks & Recreation Design Standards as shown on the plans and available online at:

http://parks.arlingtonva.us/design-standards/

1.02 DEFINITIONS

A. Finish Grade: Elevation of finished surface of planting soil.

B. Imported Topsoil: Soil obtained off-site that meets the specifications herein for topsoil and is suitable for use in planting soil/backfill soil mixture when existing soil quantities are insufficient.

C. Planting Soil/Backfill Soil Mixture: Existing soil modified as specified to be suitable for planting.

E. Subgrade: Surface or elevation of subsoil remaining after completing excavation, or top surface of a fill or backfill, before placing planting soil.

F. ISA: International Society of Arboriculture

G. CBAY: Chesapeake Bay, typically referring to CBAY watershed.

H. Urban Forester/County Urban Forester: Refers to the Arlington County Urban Forester

I. Landscape Architect: Refers to an Arlington County Landscape Architect or their designee.

1.03 SUBMITTALS

A. Samples of all materials specified shall be submitted to the Project Officer for approval with coordination of the Landscape Architect. All approvals shall be in writing.

B. Samples:

a. Existing Topsoil: Provide 1-pound sample of existing topsoil with the following soil test reports.

i. Fertility: pH, nitrate nitrogen, ammonia nitrogen, phosphate phosphorous, potassium, calcium, magnesium, zinc, iron, manganese.

ii. Suitability: total salinity, boron, sodium, potassium, calcium, magnesium, chloride, sulfate.

iii. Physical properties including organic content and particle size distribution.

b. Imported Topsoil: If imported topsoil is required, Contractor shall provide a 1-pound sample of the imported topsoil with the soil test reports as noted above for "Existing Topsoil."

c. Imported Topsoil for Bioretention Areas: If bioretention areas are indicated in the approved plans, the Contractor shall submit soil sample per specifications.

d. Mulches and Organic Matter/Compost: Sample of mulch and organic matter/compost may be requested in lieu of inspection.

e. Product certificates: Contractor shall submit for each type of manufactured product, to be approved by the Project Officer in coordination with Landscape Architect or Urban Forester and complying with the following:

a. Manufacturer's certified analysis for standard products.

f. Geotextile/Soil Stabilization/Erosion Control Fabric: Sample

1.04 QUALITY ASSURANCE

A. Contractor shall have all existing and furnished topsoil to be used for seeding and sodding, and for planting areas tested by a state laboratory or recognized commercial soil-testing laboratory in order to determine recommendations for the types and quantities of soil amendments. The results of this test shall determine the rates and types of fertilizers, lime, soil conditioners, and other amendments, if necessary.

a. Soil tests shall use a representative sample of on-site soils. If existing soil has been undisturbed and is suitable as determined by the soil test, no additional amendments are required.

b. Adjustments should be made based on soil test results.

PART 2 - PRODUCTS

2.01 MATERIALS

A. All materials shall conform to those stipulated below, unless otherwise approved in writing by the Project Officer with confirmation by the Landscape Architect or County Urban Forester.

B. Specified materials to be applied in amounts and methods herein stipulated.

C. Delivery tickets indicating date, weight, analysis and vendor's name, to be submitted to Project Officer.

2.02 SOIL AMENDMENTS

A. Lime: Application rates for liming materials and lime material type chosen shall be determined by required soil tests and approved by the Project Officer in coordination with the Landscape Architect or Urban Forester.

a. When required and unless test results indicate otherwise, lime material shall be dry and free flowing pulverized limestone, hydrate lime or burnt

lime that contains at least 50% total oxides (calcium oxide plus magnesium oxide). Ground limestone shall be ground to such fineness that at a minimum of 50% shall pass through a 100 mesh sieve and 98% - 100% shall pass through a 20 mesh sieve. Lime material shall meet the Virginia Agricultural Liming Materials Act, Code of Virginia Section 3.1-126.1.

B. Fertilizer: Fertilizer type and application rate shall be determined by results of required soil tests and approved by the Project Officer in coordination with the Landscape Architect or Urban Forester:

a. When required and unless test results indicate otherwise, commercial-grade complete fertilizer shall be of neutral character, consisting of fast- and slow-release nitrogen, 50 percent derived from natural organic sources of urea formaldehyde, phosphorous, and potassium in the following composition:

i. Composition: 10 percent nitrogen, 20 percent phosphorous, and 10 percent potassium, by weight.

b. All fertilizers shall be uniform in composition, free flowing, and suitable for application with approved equipment.

c. Fertilizers shall be 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 product.

C. Delay mixing fertilizer with planting soil if planting shall not proceed within 2 days.

D. Spread fertilizer and lime with approved equipment.

2.03 EXISTING TOPSOIL

A. Existing, native surface topsoil formed under natural conditions with the duff layer retained during excavation period and stockpiled.

a. Contractor shall verify suitability of stockpiled soil to produce or to be amended to produce viable planting soil for lawns and planting beds as described herein.

B. Existing topsoil is to be used to extent possible for lawn areas and is to be amended per the specifications to become the Planting Soil/Backfill Soil Mixture for use in planting pits and bed areas.

C. Prior to use for lawn areas or in planting soil mix, Contractor shall remove all stones, roots, plants, sod, clods, and clay lumps larger than 1/2 –inch in any direction, pockets of coarse

D. sand, concrete slurry, concrete layers or chunks, cement, plaster, building debris and other extraneous materials that are harmful to plant growth.

E. After removal of debris and extraneous materials noted above, the Contractor shall obtain soil tests for the existing soil per the requirements in section 1.04 "Quality Assurance."

F. Contractor shall submit soil test results to the Project Officer for approval with confirmation by the Landscape Architect or Urban Forester.

G. Contractor shall supplement the existing soil as recommended in soil test results to achieve a viable planting soil for lawns and/or planting beds. Contractor shall supplement with imported topsoil per the specifications from off-site sources when quantities of approved, existing topsoil are insufficient for lawns and planting beds.

H. Contractor shall submit a sample of the topsoil that has been amended based on soil test results for approval by the Project Officer with confirmation by Landscape Architect or Urban Forester prior to use in lawn areas or planting beds or pits.

I. Topsoil installed on grade shall attempt to match existing soil texture, except for situations where clay subsoil exists. In the event that clay subsoil exists, use loam or silt loam topsoil.

J. Imported topsoil rather than existing topsoil is to be used for planting in bioretention areas, unless otherwise indicated on the approved plans.

2.04 PLANTING SOIL MIX/BACKFILL SOIL MIXTURE

A. The planting soil mix (also known as backfill soil mixture) shall consist of existing topsoil that has been approved for planting per the specifications above and approved organic matter.

B. The planting soil mix/backfill soil mixture shall be composed of ¾ approved existing topsoil and ¼ approved organic matter as described in the Arlington County DPR Standard planting details, unless otherwise indicated by the Project Officer with confirmation by the Landscape Architect or Urban Forester.

2.05 IMPORTED TOPSOIL

A. Contractor shall add imported topsoil when required on the drawings, when quantity of existing topsoil is insufficient or when determined to be necessary due to soil testing results.

B. Topsoil shall be the natural, original surface soil, a sandy loam uniform in composition and shall be in a friable condition and shall contain less than 3 percent subsoil, hardpan material, stones and clods larger than 1/2 inch in diameter in any direction. It shall also be free of sticks, tree or shrub roots, debris and other material undesirable for plant growth. The area and the topsoil shall be free of undesirable plant such as, but not limited to, Bermuda grass, nut sedge, mugwort or noxious weeds as set forth in the Federal Seed Act.

C. The topsoil shall contain at least 5 percent organic matter. It shall be a sandy loam consisting of at least 5 but not more than 20% clay, at least 10 but not more than 80% sand. It shall have a pH between 5.5 to 6.5. Soluble salts (salinity) shall not exceed 500 ppm. Soil fertility shall be "High" in natural nutrients based on the coordinated ratings in pounds per acre as established by the National Soil and Fertilizer Research Committee.

D. Topsoil which has been manufactured by blending materials which individually do not meet the requirements of this specification shall not be accepted even though the resulting blend meets the organic matter, mechanical analysis, pH and soluble salts requirements. Agricultural limestone at not more than 5 pounds per cubic yard of topsoil any be used to adjust the pH provided it is well mixed in a manner which does not destroy the structure of the soil.

2.06 IMPORTED TOPSOIL FOR BIO-RETENTION AREAS

A. If bioretention is specified in the approved plans, soil for bioretention areas shall comply with the Filter Media and Surface Cover section of the Virginia Department of Environmental Quality's(DEQ) Design Specification No. 9 for Bioretention, Version 2.0, January 1, 2013.

2.07 MULCHES AND ORGANIC MATTER

A. Straw Mulch for Seeded Areas: Provide air-dry, clean, mildew and seed-free, salt hay or threshed straw of wheat, rye, oats or barley.

B. Wood Chip Bark Mulch for Planted Areas: Wood Chip Bark Mulch shall be double-shredded hardwood bark mulch, uniform in size and free of stones, clods, non-organic debris or other foreign material and aged for at least 6 months from an approved source. Insufficiently or improperly aged mulch containing high bacterial counts or high levels of bark or other materials resistant to decomposition shall not be used. Mulch shall not contain the trunk of trees.

C. Organic Matter/Compost Mulch: Well-composted, trash-free, stable, and weed-free organic matter such as composted bark, leaf mold or other plant debris material that has been composted to a point of decay and is mature.

a. pH ranges of 5.5 to 8; moisture content 35 to 55 percent by weight

b. 100 percent passing through 1-inch sieve

c. Peat moss shall not be used.

d. Organic amendments shall be commercially prepared and shall comply with the U.S. Compost Council Seal of Testing Assurance Program's Test Methods for the Examination of Composting and Compost (STA/TMECC) criteria, or as modified in approved plan documents.

2.08 SOIL STABILIZATION/EROSION CONTROL FABRIC

A. ECS-2B Double New Straw Biodegradable Rolled Erosion Control Product, or an approved equal shall be used in all planting beds/reforestation areas.

a. Shall meet Type 2.D specifications for ECTC and HFWA FP-03 Section 713.17

b. Shall have two (2) layers of organic jute netting sewn together with biodegradable thread.

c. Overlap sections 12" and secure with manufacturer's recommended steel wire staples, 6 inches long.

B. Erosion-Control Blankets: Biodegradable wood excelsior, straw, or coconut-fiber mat enclosed in a photodegradable plastic mesh. Include manufacturer's recommended steel wire staples, 6 inches long.

C. Erosion-Control Fiber Mesh: Biodegradable burlap or spun-coir mesh, a minimum of 0.92 lb/sq. yd with 50 to 65 percent open area. Include manufacturer's recommended steel wire staples, 6 inches.

D. Erosion-Control Mats: Cellular, non-biodegradable slope-stabilization mats designed to isolate and contain small areas of soil over steeply sloped grades, of 3 inch nominal mat thickness. Include manufacturer's recommended anchorage system for slope conditions.

a. Products: Subject to compliance with requirements and plan documents, the products below, or an approved equivalent, be used:

i. Invisible Structures, Inc.; Slopetame 2

ii. Tenax Corporation – USA; Tenweb.

PART 3 - EXECUTION

3.01 PREPARATION

A. All identified areas within the project limits shall have approved topsoil mix spread on them and be prepared for seeding and sodding by bringing ground surfaces to grades shown on the drawings. Planting pits and bed areas identified on the approved plans shall be prepared in accordance with the applicable DPR Landscape Standard details.

a. No seeding shall be done on frozen ground or when the temperature is

32F or lower. Refer to specification 329200, "Seeding and Sodding." Install erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties, sidewalks and areas.

b. Rototilling shall not be performed within the critical root zone of trees to be preserved.

c. The soil shall not be tilled or amended when the soil's moisture capacity is above field capacity or when the soil is frozen.

d. Contractor shall identify utilities, existing irrigation and underground utilities. All areas on either side of the utility marking shall be amended by hand.

e. Contractor shall verify that no foreign or deleterious material or liquid has been deposited in soil within a planting area.

f. Contractor shall proceed with installation only after both unsatisfactory conditions have been corrected and rough grading has been completed and approved by the Project Officer in coordination with the Landscape Architect or Urban Forester.

g. Contractor shall protect structures, utilities, sidewalks, pavements and other facilities, trees, shrubs and plantings from damage caused by planting operations.

    a. Protect adjacent and adjoining areas from hydro-seeding and hydro-mulching overspray.

    b. Protect grade stakes set by others until directed to move them.

h. Surfaces shall conform to finish grade, free of water retaining depressions, soil friable, free of clay and of uniformly firm texture.

B. Newly Graded Subgrades: Loosen subgrade to a minimum depth of 6 inches. Remove stones larger than 1/2 inch in any direction and sticks, roots, rubbish, and other extraneous matter including grass vegetation and turf and legally dispose of them off of Arlington County property. Do not mix into surface soil.

a. Thoroughly blend planting soil mix off-site before spreading or spread topsoil, apply soil amendments and fertilizer on surface, and thoroughly blend planting soil mix. Delay mixing amendments with soil if planting shall not proceed within 2 days.

b. Loosen surface soil to a depth of at least of 6 inches. Apply soil amendments and fertilizers according to planting soil mix proportions and mix thoroughly into top 4 inches of soil. Till soil to a homogeneous mixture of fine texture.

c. Spread planting soil mix to a depth of 4 inches but not less than required to meet finish grades after light rolling and natural settlement. Do not spread if planting soil or subgrade is frozen, muddy, or excessively wet.

C. Unchanged Subgrades: If lawns are to be planted in areas unaltered or undisturbed by excavating, grading, or surface soil stripping operations, prepare surface soil as follows:

a. Remove stones larger than 1/2 inch in any dimension and sticks, roots, trash, and other extraneous matter. Legally dispose them off of Arlington County property. Do not mix into surface soil

b. Loosen surface soil to a depth of at least 6 inches, apply soil amendments and fertilizers according to the planting soil mix proportion and mix thoroughly into the top 4 inches of soil.

D. Finish Grading: Grade landscape areas to a smooth, uniform surface plane with loose, uniformly fine texture. Grade to within plus or minus 1/2 inch of finish elevation. Adjust for the thickness of sod, where applicable. Roll and rake, remove ridges, and fill depressions to meet finish grades. Limit fine grading to areas that can be planted in the immediate future.

E. If bioretention areas are specified in the approved plans, the Contractor shall construct these areas in accordance with the Virginia DEQ Stormwater Design Specification No. 9, Version 2.0, January 1, 2013.

F. Contractor shall avoid unnecessary compaction of the soil during grading.

G. Contractor shall ensure appropriate slopes of the swales, berms and final grades.

H. Immediately following each day's work, contractor shall clean all dirt, excess soil, debris and trash from the site. Contractor shall protect and store additional soils in stockpiles protected from saturation, erosion, weed growth and contamination with plastic sheeting or tarps.

I. Amendments for seeding and sodding areas shall be applied after determining by soils test as follows:

a. Lime as specified shall be spread uniformly over designated area. Rate depends on soil tests. Soil tests shall be made before lime application at 8 to 10 plugs per acre taken by the method prescribed the United States Department of Agriculture.

b. Fertilizer shall be spread after the lime has been applied. Rate shall be as recommended per the soil tests.

c. Fertilizer shall be spread with approved equipment and at an even rate over the area to be seeded or sodded.

d. Work lime and fertilizer into top 4 inches of topsoil and grade to smooth surface ready for seeding.

J. Restore areas if eroded or otherwise disturbed after finish grading and before planting.

K. Prepared lawns and planting areas shall be inspected and approved by Project Officer in coordination with Landscape Architect prior to seeding, sodding or planting.

L. If the graded areas develop volunteer weed growth, the growth shall be eliminated at the expense of the Contractor.

3.02 SOIL STABILIZATION MATERIALS

A. Prepare planting area as specified.

B. Moisten prepared planting area before planting if surface is dry. Water thoroughly and allow surface to dry before planting. Do not create muddy soil.

C. Install Soil Stabilization from top of slope, overlapping joints by 12 inches, working downward, and as recommended by material manufacturer for site conditions. Fasten as recommended by material manufacturer.

D. Plant shrubs, trees and perennials through Soil Stabilization fabric by carefully separating fabric layers to allow space for planting.

E. Remove non-biodegradable stabilization materials after plant establishment.

PART 4 - MEASUREMENT AND PAYMENT

4.01 The measurement of PLANTING MIX to be paid for shall be per CUBIC YARD of planting mix in accordance with the plans, specifications and to the satisfaction of the Project Officer.

4.02 The unit price for PLANTING MIX shall include the cost of furnishing all labor, materials, equipment and incidental expenses, including but not limited to soil amendments, organic matter, and soil stabilization materials, necessary to complete the work, all in accordance with the plans, specifications and approval of the Project Officer.

4.03 The measurement of BIORETENTION SOIL MEDIA to be paid for shall be per CUBIC YARD of planting mix in accordance with the plans, specifications and to the satisfaction of the Project Officer.

4.04 If bioretention is explicitly called for in the approved plans, the unit price for BIORETENTION SOIL MEDIA shall include the cost of furnishing all labor, materials, equipment and incidental expenses, including but not limited to soil amendments, organic matter, and soil stabilization materials, necessary to complete the work, all in accordance with the plans, specifications and approval of the Project Officer.

4.05 The measurement of WOOD MULCH to be paid for shall be per CUBIC YARD of Mulch in accordance with the plans, specifications and to the satisfaction of the Project Officer.

4.06 The unit price for WOOD MULCH shall include the cost of furnishing all labor, materials, equipment and incidental expenses necessary to complete the work, all in accordance with the plans, specifications and approval of the Project Officer..

4.07 Unless otherwise specified on the project drawings, supplemental specifications or special conditions, excavation is considered incidental to the work and therefore no separate payments shall be made for excavation.

PART 1 - GENERAL

1.01 SUMMARY

A. The work includes, but is not limited to the provision of all material, services, labor, and equipment necessary to perform the following as required per the plans for the establishment of turf, meadow grasses and/or wildflowers:
   a. Seeding
   b. Sodding
   c. Hydro-seeding
   d. Plugging

B. Related Sections:
   a. Section 02200 – Earthwork
   b. Section 329100 – Planting Preparation
   c. Section 311300 – Tree Protection and Root Pruning
   d. Section 329300 – Exterior Plants
   e. Section 01500 – Erosion and Sediment Control and Pollution Prevention

C. In addition to the specifications contained herein, Work shall be performed in accordance with the:
   a. Drawings and general provisions of the contract, including general and supplementary conditions.
   b. Arlington County Department of Parks & Recreation (DPR) Design Standards as shown on the plans and available online on the Arlington County Website

1.02 DEFINITIONS

A. Finish Grade: Elevation of finished surface of planting soil.

B. Imported Topsoil: Soil obtained off-site that meets the specifications herein for topsoil and is suitable for use in planting soil/backfill soil mixture when existing soil quantities are insufficient. Refer to Section 329100 “Planting Preparation.”

C. Planting Soil/Backfill Soil Mixture: Existing soil modified as specified to be suitable for planting. Refer to Section 329100 “Planting Preparation.”

D. Subgrade: Surface or elevation of subsoil remaining after completing excavation, or top surface of a fill or backfill, before placing planting soil.

E. ISA: International Society of Arboriculture

F. CBAY: Chesapeake Bay, typically referring to CBAY watershed.

G. Urban Forester/County Urban Forester: Refers to the Arlington County Urban Forester

H. Landscape Architect: Refers to an Arlington County Landscape Architect or their designee.

1.03 SUBMITTALS

A. Samples of all materials shall be submitted to the Project Officer for approval with confirmation by the County Landscape Architect prior to delivery to site.

B. Contractor shall submit qualifications per section 1.04 "Quality Assurance" to Project Officer for approval.

C. Samples:

a. Seed Mix: Certification of grass seed including the botanical and common name, percentage by weight of each species and variety, and percentage of purity, germination, and weed seed. Include the year of production and the date of packaging.

b. Sod: Sod grower's name, together with substantiating information as to field location from which sod is to be cut and species, percent purity and mixture of grass sod to be applied. Samples or photos of sod mix may be requested in lieu of inspection.

c. Special Seed Mixes: Contractor shall submit product data per section 2.03.

1.04 QUALITY ASSURANCE

A. Contractor qualifications:

a. Evidence of completion of at least three (3) projects of similar nature and scope to this project completed within the last five (5) years that have resulted in successful turf and meadow establishment

b. Contractor shall be a member in good standing of either the Professional Landcare Network or the American Nursery and Landscape Association.

c. Experience: Three to Five years' experience in turf installation.

B. Contractor shall maintain an experienced full-time supervisor on Project site when work is in progress.

PART 2 - PRODUCTS

2.01 MATERIALS

A. All materials shall conform to those stipulated below, unless otherwise approved in writing by the Project Officer with confirmation by the Landscape Architect.

B. Specified materials to be applied in amounts and methods herein stipulated.

C. Delivery tickets indicating date, weight, product data including all analyses for purity and other information as required herein, and vendor's name, to be submitted to Project Officer for approval.

2.02 SEED

A. Grass seed shall be fresh, clean, dry new crop seed complying with purity and germination requirements stipulated herein. All cultivars must be on the current "Virginia Turfgrass Variety Recommendations" or in the top 25 for transitional zone sites-overall of the latest National Turfgrass Evaluation Program (NTEP) as approved by Project Officer with confirmation by the Landscape Architect. The Turf-type Tall Fescue component shall be comprised of a minimum of two cultivars with each cultivar comprising neither less than 30 percent nor more than 70 percent of the blend. The use of K-31 Tall Fescue or Common Kentucky Bluegrass in the mix is prohibited. The mix shall have 2.5 percent maximum inert matter, 0.5 percent maximum crop seed, and 0.1 percent maximum weed seed and 0.0 percent noxious weed. The mix shall comply with the current Virginia Seed Law and Virginia Seed Regulations and approximate the following:

Kind of Seed	% by Weight	% Purity	% Germination
Turf-type Tall Fescue	80	97	85
Bluegrass	10	97	80
Perennial Ryegrass	10	97	90

B. Substitution of seed type or percent only on approval of Project Officer in coordination with Landscape Architect. Seed to be free of noxious weed seed.

2.03 SOD

Cultivated Grass Sod shall be certified and obtained from State Certified nurseries and have been grown on natural native mineral soils comparable to those afforded at the job site. Sod containing netting is not acceptable. Sod grower's information and sod information to be submitted for approval by Project Officer per section 1.03 "Submittals." Failure to obtain advance approval shall constitute grounds for rejection of all sod delivered to the site. Invoices for all sod to clearly state point of origin and have attached to them a facsimile of the Grower's Nursery Certificate issued by the U.S. Department of Agriculture or Certified Delivery Ticket per truckload. All grass sod shall meet the following basic requirements.

a. Sod shall be free of disease and soil borne insects.

b. Sod shall be free of clover, broadleaf weeds and noxious weeds. Sod considered free of such weeds if less than 2 such plants are found per 100 square feet of area.

c. Sod shall be of uniform color and density and contain:

Kind of Seed	% by Weight
Turf Type Tall Fescue	90
Kentucky Bluegrass	10

d. All cultivars must be on the current approved list of the Virginia Turfgrass Variety Recommendations and the sod shall be certified by the Virginia Sod Certification Program. Provide appropriate certifications at the time of installation.

e. Sod sample shall be submitted to and approved by Project Officer in coordination with the Landscape Architect before cutting. Sod placed on the job shall conform to the approved sample or shall be removed and replaced at the Contractor's expense.

f. Sod shall have been mowed prior to stripping and shall have been maintained for a minimum of three months.

g. Sod shall be relatively free of thatch. Thatch build up that significantly detracts from the appearance of the sod may be sufficient cause for rejection.

h. Sod shall be machine stripped at a uniform soil thickness of approximately ¾-inch. Measurement for thickness to exclude tip growth and thatch.

i. Individual pieces of sod shall be cut to supplier's standard width and length. Maximum allowable deviation from standard widths and lengths shall be 5%. Broken pads, torn or uneven ends shall not be permitted.

j. Root development shall be such that standard size pieces shall support their own weight and retain their size and shape when suspended vertically from a firm grasp on uppermost 10% of the area.

k. Under moderate moisture conditions, weight shall not exceed 7 pounds per square foot. Minimum weight shall not be less than 4 lbs. per square foot.

2.04 SPECIALTY SEED (WILFLOWERS, BIORETENTION, and/or REFORESTATION)

A. When specialty seed is explicitly specified in approved plans, and unless otherwise indicated, the specialty seed mix shall be as follows:

a. Virginia Northern Piedmont Riparian Mix variation. Fresh, clean and dry new weed, of mixed species as follows:

i. 22% River Oats, PA/VA Ecotype (Chasmanthium latifolium)

ii. 15% Indiangrass, PA Ecotype (Sorghastrum nutans)

iii. 15% Virginia Wildrye, PA Ecotype (Elymus virginicus)

iv. 10% Beaked Panicgrass, VA Ecotype (Panicum anceps)

v. 10% Big Bluestem, 'Niagara' (Andropogon gerardii)

vi. 10% Switchgrass (Panicum virgatum 'Shelter')

vii. 10% Autumn Bentgrass, PA ecotype (Agrostis perannans)

viii. 8% Mistflower, VA Ecotype (Eupatorium coelestinum)

b. Seed carrier: Inert material, sharp clean sand mixed with seed at a ratio of not less than two parts seed carrier to one part seed.

B. Contractor shall supply the germination test results and the percent purity of the seeds upon delivery to the site to the Project Officer. All seed shall be cleaned, processed, analyzed for purity, stored, and germination tested before being used. Every seed variety contains different germination rates and requirements.

C. Execution:

a. Sow seed with spreader or seeding machine. Do not broadcast or drop seed when wind velocity exceeds 5 mph. Evenly distribute seed by sowing equal quantities in two directions at right angles to each other.

b. Brush seed into top 1/8 inch of soil, roll lightly and water with light spray.

c. Protect seeded areas by applying compost mulch within 24 hours after completing seeding operations. Soak areas, scatter mulch uniformly to a thickness of 3/16 inch and roll surface smooth.

d. Water newly planted areas and keep moist until established.

2.05 SOILS & SOIL AMENDMENTS

A. Refer to Section 329100 "Plant Preparation" soils and soil amendment specifications.

2.06 MULCHES/ ORGANIC MATTER

A. Refer to Section 329100 "Plant Preparation" for mulch specifications.

2.07 SOIL STABILIZATION/EROSION CONTROL FABRIC

A. Refer to Section 329100 "Plant Preparation" for specifications.

PART 3 - EXECUTION

3.01 PREPARATION

A. Refer to Section 329100 "Plant Preparation" for specifications.

3.02 SEEDING - GRASS

A. All areas within the project limits that are not shown for paving, sodding, or special treatment shall be seeded with the specified seed mix.

B. Seeding shall take place between August 15th and October 15th or between March 15th to May 15th. Approval from Project Officer/Landscape Architect shall be required before seeding is to begin.

C. Use 4" of prepared topsoil as base for areas to be seeded.

D. No seeding shall be done during windy weather (winds over 5 mph) or when ground is wet or otherwise non-tillable. No seed shall be done on frozen ground or when the temperature is 32 or lower.

E. Seed shall be uniformly distributed by hydro-seeding methods as specified:

a. Slurry

i. Seed as specified at a rate of 350 lbs./acre.
ii. Mulch: virgin wood fiber type applied at a rate of 1200 lbs./acre.
iii. Tackifier: Guar type or approved equal applied at a rate of 40 lbs./acre.
iv. Fertilizer: 19-19-19 granular applied at a rate of 500 lbs./acre.
v. Lime: Flowable liquid lime at a rate of 5 gallons per acre.
vi. Dye: Slurry must be green with dye added if not included with the mulch.
vii. Application rate: 3000 gallons per acre. Agitation must be maintained throughout mixing and application.
viii. Slurry shall be applied within 8 hours of the start of mixing.

ix. In lieu of hydro-seeding, seed may be drilled or an alternate method may be used. If an alternate method is used, seeding shall have to be run in two directions. The second direction

being at right angles to the first direction. Requests for using alternate methods shall be approved by the Project Officer prior to application of seed.

x. Sow seed at the rate of 5 to 8 lb/1000 sq. ft.

xi. Rake seed lightly into top 1/8 inch of topsoil, roll lightly, and water with fine spray.

xii. Protect seeded areas with slopes not exceeding 6:1 by spreading straw mulch. Spread uniformly at a minimum rate of 2 tons/acre to form a continuous blanket 1-1/2 inches in loose depth over seeded areas. Spread by hand, blower, or other suitable equipment.

xiii. Areas indicated on plan or exceeding 6:1 slope shall be protected with erosion control fabric, jute mat, or similar slope protection, installed according to manufacturer's written instruction, and/or as approved by the Project Officer.

3.03 SODDING

A. All sod shall be transplanted within 24 hours from the time it is harvested unless stacked at its destination in a manner satisfactory to the Project Officer. Do not lay down if dormant or if the ground is frozen or muddy.

B. All sod in stacks shall be kept moist and protected from exposure to air and sun and from freezing. Any sod permitted to dry out may be rejected whenever, in judgment of Project Officer, its survival after placing is doubtful. No payment shall be made for rejected sod. In any event, no more than forty-eight hours shall lapse between cutting and planting of sod is permitted.

C. Before placing or depositing sod upon any surfaces, all shaping and redressing of such surfaces as described under Seeding Soil Preparation shall be completed. The bed area for sod shall be dug out so that when the sod is installed the adjacent soil shall be flush with the top of the sod root mat. Areas shall be watered lightly before the placing of sod; sod shall not be placed on dry surfaces. Completed areas to be sodded shall be a smooth, uniform, well-tilled surface true to line and cross section. Any raking required shall be done immediately prior to placement of the sod at no additional cost to Owner.

D. No sod shall be placed at any time temperature is below 32 degrees Fahrenheit. No frozen sod shall be used and no sod shall be placed upon frozen, powder dry or excessively wet soil.

E. Use 4" of prepared topsoil as base for areas to be sodded.

F. Sod shall be lifted from trucks or storage piles by hand and placed with closed joints and no overlapping. All cracks, seams and voids shall be closed with small pieces of sod. After laying sod shall be sprinkled thoroughly and then tamped. "Tamping" consists of firmly closing seams between strips by use of hand tampers

or approved rollers. All sod shall be thoroughly rolled after closing all seams. Correct any slipping of sod.

G. Adequate water and watering equipment must be on hand before sodding begins and sod shall be kept moist until root system adheres to original seed bed and becomes established and accepted by Project Officer.

H. Sod shall be laid with long edges parallel to contours, except in swales or ditches where it shall be placed perpendicular to the flow line. Only sod placed in swales or ditches shall be staked using 2 stakes per roll of sod. Stakes shall be wood wedges ½" x 1" x 12". Successive strips to be neatly matched and all joints staggered. Sod shall be laid in all areas indicated on landscape plans.

3.04 REFORESTATION

A. Prepare planting area per the specifications.

B. Reforestation process:

a. Reforestation seed mix shall be applied prior to installation of Erosion Control Fabric. Rake seed lightly into the top 1/8 inch of soil, roll lightly and water with fine spray.

i. Do not use wet seed or seed that is moldy or otherwise damaged.

ii. Do not seed against existing trees or vegetation to remain within reforested area limits.

iii. Top dress seed by applying composted mulch within 24 hours after seeding operation. Soak areas, scatter mulch uniformly to a thickness of 1/2 inch and roll surface smooth.

b. Install erosion control fabric from top of slope, overlapping joints by 12 inches, working downward, and as recommended by material manufacturer for site conditions. Fasten as recommended by material manufacturer.

c. Moisten prepared planting area before planting if surface is dry. Water thoroughly and allow surface to dry before planting. Do not create muddy soil.

d. Plant shrubs, trees and perennials through erosion control fabric by carefully separating fabric layers to allow space for planting.

C. Remove non-degradable erosion-control measures after grass establishment period.

3.05 PROTECTION

A. Install post and rope barriers around seeded areas. Tie cloth or ribbon to rope at 10' intervals.

B. Install "KEEP OFF LAWN" signs at appropriate locations.

C. Remove non-biodegradable erosion control measures after plant establishment period.

3.06 MAINTENANCE

A. Maintain surfaces and supply additional topsoil where necessary, including areas affected by erosion.

B. Water to ensure uniform seed germination and to keep surface of soil damp:

a. Each watering shall consist of 1 gallon per 3 sq. yd. of seed or sod

b. Apply water slowly so that surface of soil shall not puddle and crust

C. Cut lawn areas when grass reached height of 3". Maintain minimum height of 2". Do not cut more than 1/3 of blade at any one mowing.

D. After first mowing of lawn, water grass sufficiently to moisten soil from 3" to 5" deep.

E. Reseed damaged grass areas showing root growth failure, deterioration, bare or thin spots and erosion.

3.07 GUARANTEE

A. The Contractor shall be responsible for maintaining all sodded and seeded areas in a healthy, vigorous condition in accordance with Section 3.05 "Maintenance" at his/her own expense until all contracted work is completed and accepted by Project Officer with confirmation by the Landscape Architect or Urban Forester.

B. The Contractor shall, at his own expense, replace any seed or sod which has died or been damaged during the establishment period.

C. Cost of seed and sod shall be withheld from final payment until final approval is given by Project Officer.

3.08 ACCEPTANCE

A. Seeded areas shall be accepted when an even, healthy, close and uniform stand of turf, 3" tall, free of weeds and surface irregularities, with coverage exceeding 90 percent over any 10sq. ft. and bare spots not exceeding 4 by 4 inches is properly established. Bare spots in excess of 4" shall be re-seeded at a rate per section 3.02 of this specification.

B. Sodded areas shall be accepted provided all requirements, including maintenance, have been complied with and sod is well established in a healthy, vigorous growing condition. Reestablish lawns that do not comply with requirements and continue maintenance until lawns are satisfactory.

C. Upon completion, all debris and waste material resulting from seeding/sodding/mulching activities shall be removed from the project area and legally disposed of. Any damaged areas shall be restored to their original condition.

D. Upon acceptance by Project Officer at Final Completion, Arlington County shall assume all lawn maintenance responsibilities.

PART 4 - MEASUREMENT AND PAYMENT

4.01 The measurement of SEEDING to be paid for shall be per SQUARE YARD of seeded grass in accordance with the approved plans and specifications.

4.02 The unit price for SEEDING shall include the cost of furnishing all labor, materials, equipment and incidental expenses necessary to complete the work, including but not limited to erosion control, topsoil, mulch, protection and maintenance, all in accordance with the approved plans and specifications.

4.03 The measurement of SPECIALTY SEEDING to be paid for shall be per SQUARE YARD of reforestation seed mix in accordance with the approved plans and specifications.

4.04 The unit price for SPECIALTY SEEDING shall include the cost of furnishing all labor, materials, equipment and incidental expenses necessary to complete the work, including but not limited to erosion control, topsoil, mulch, protection and maintenance, all in accordance with the approved plans and specifications.

4.05 The measurement of SOD to be paid for shall be per SQUARE YARD of sod installed in accordance with the approved plans and specifications.

4.06 The unit price for SOD shall include the cost of furnishing all labor, materials, equipment and incidental expenses necessary to complete the work, including but not limited to erosion control, protection and maintenance, all in accordance with the approved plans and specifications.

4.07 Unless otherwise specified on the project drawings, supplemental specifications or special conditions, excavation is considered incidental to the work and therefore no separate payments shall be made for excavation.

1.01 SUMMARY

PRODUCT DATA SHEET 4 - This Section includes trees, shrubs, groundcover, bulbs, and perennial plants.

PRODUCT DATA SHEET 5 - Provide all labor, materials, tools and equipment as required to have plants, topsoil, amendments, mulch and seed and/or sod applied on all areas called for on the approved plans.

PRODUCT DATA SHEET 6 - Related Sections:

a. 02200 Earthwork

b. 329100 Planting Preparation

c. 311300 Tree Protection and Root Pruning

d. 01500 Erosion and Sediment Control and Pollution Prevention

e. 329200 Seeding and Sodding

PRODUCT DATA SHEET 7 - In addition to the specifications contained herein, Work shall be performed in accordance with the:

a. Drawings and general provisions of the contract, including general and supplementary conditions

b. Arlington County Department of Parks & Recreation Design Standards as shown on the plans and available online at:

http://parks.arlingtonva.us/design-standards/

1.02 DEFINITIONS

A. Finish Grade: Elevation of finished surface of planting soil.

B. Imported Topsoil: Soil obtained off-site that meets the specifications herein for topsoil and is suitable for use in planting soil/backfill soil mixture when existing soil quantities are insufficient. Refer to Section 329100 “Planting Preparation.”

C. Planting Soil/Backfill Soil Mixture: Existing soil modified as specified to be suitable for planting. Refer to Section 329100 “Planting Preparation.”

D. Subgrade: Surface or elevation of subsoil remaining after completing excavation, or top surface of a fill or backfill, before placing planting soil.

E. ISA: International Society of Arboriculture

F. CBAY: Chesapeake Bay, typically referring to CBAY watershed.

G. Urban Forester/County Urban Forester: Refers to the Arlington County Urban Forester

H. Landscape Architect: Refers to an Arlington County Landscape Architect or their designee.

1.03 SUBMITTALS

A. All submittals specified in Section 329100 "Planting Preparation" shall be provided to Project Officer for approval with confirmation by Landscape Architect or Urban Forester. All approvals shall be in writing.

B. Product Certificates: Contractor shall submit for each type of manufactured product, to be approved by the Project Officer and complying with the following:

a. Manufacturer's certified analysis for standard products.

C. Refer to Section 329100, "Planting Preparation" for soil test requirements.

D. Contractor shall submit State Nursery inspection certificates to the Project Officer.

E. Contractor shall submit to Project Officer the verification of Landscape Industry Certified Technician and Landscape Industry Certified Officer certificates for those responsible for plant installation.

F. Planting Schedule: Contractor shall submit the planting schedule to the Project Officer for approval with confirmation by the Landscape Architect or Urban Forester. The plant schedule shall indicate anticipated planting dates for exterior plants. Contractor shall be responsible for furnishing and installing all plant material shown on the drawings and plant list, as submitted with the contract. Contractor shall have investigated the sources of supply and satisfied himself/herself that he/she can supply all of the plants specified on the drawings in the size, variety, quantity and quality noted before submitting the bid. Failure to take this precaution shall not relieve the successful bidder from the responsibility of furnishing and installing all of the plant material in strict accordance with the contract documents.

G. Substitutions:

a. The Contractor shall submit a written request for a substitute plant a minimum of forty-five (45) calendar days prior to planting date if specific plants shall not be available in time for the scheduled planting. Contractor shall submit the request to the Project Officer for approval with confirmation by the Landscape Architect or Urban Forester.

b. Contractor shall be responsible for documenting any plant suitability or availability problems.

c. If a substitute plant is offered to the County, it shall be of the same size, value and quality as the plant originally specified on the plan, as determined by the Project Officer in coordination with the Landscape Architect or Urban Forester. If the County does not accept the substitute plant, the Contractor shall provide the type

and size of plant material specified on the plans, or a substitute requested by the Project Officer in coordination with the Landscape Architect or Urban Forester.

H. Maintenance Instructions: Contractor shall submit to the Project Officer recommended procedures for maintenance of exterior plants during a calendar year. Submit before end of required maintenance periods.

1.04 QUALITY ASSURANCE

A. Installer Qualifications:

a. Contractor shall designate a project crew leader who possesses one or more of the following certifications:

i. Certified by the Professional Landcare Network (PLANET) as a "Landscape Industry Certified Technician"

ii. Certified by the Professional Landcare Network (PLANET) as a "Landscape Industry Certified Officer"

b. The Contractor shall identify to the Project Officer at least one full-time on-site supervisor who is the Contractor's competent, qualified, and authorized person on the worksite and who is, by training or experience, familiar with the policies, regulations and standards applicable to the work being performed, and capable of sufficiently communicating with the Project Officer.

c. Crew leader and supervisor may be the same individual.

B. Installer Qualifications for Reforestation Projects (required only if approved plans specify reforestation, afforestation or streambank restoration):

a. ISA Certified Arborist shall be on the worksite during planting of reforested areas.

b. Demonstrate experience in Reforestation/Afforestation and Stream-Bank Stabilization projects through:

i. Project portfolio detailing a minimum of three (3) successfully completed reforestation/afforestation/streambank restoration projects in the CBAY watershed area over the past three years.

c. The County shall, throughout the contract term, have the right of reasonable rejection and approval of staff or subcontractors assigned to the project by the Contractor. If the County reasonably rejects staff or subcontractors, the Contractor shall provide replacement staff or subcontractors satisfactory to the County in a timely manner and at no additional cost to the County. The day-to-day supervision and control of the Contractor's employees, and any employees of any of it subcontractors, shall be solely the responsibility of the Contractor.

C. Topsoil Analysis: Furnish soil analysis by a qualified soil-testing laboratory. Comply with requirements in Section 329100, "Planting Preparation."

D. Provide quality, size, genus, species, and variety of exterior plants indicated, complying with applicable requirements in the most current version of ANSI Z60.1, "American Standard for Nursery Stock." Plants shall be nursery grown stock and conform to the requirements described in the most current issue of the American Standard for Nursery Stock (ANSI) published by the American Nursery and Landscape Association. The Project Officer with confirmation by the Landscape Architect or Urban Forester may reject any non-conforming stock and has the option to field-select plant materials prior to purchasing.

E. Collected material may be used only when approved by Project Officer with confirmation by Arlington County Urban Forester and/or DPR PNR Natural Resource Manager

F. Nomenclature shall be in accordance with *Hortus III*, by L.H. Bailey. All trees and shrubs shall be labeled with a securely attached, waterproof tag bearing legible designation of botanical and common name. Perennials and groundcovers shall be clearly identified with a waterproof tag bearing legible designation of botanical and common name within the container.

G. Pre-installation Conference: Conduct conference at Project site with Project Officer, Arlington County Urban Forester and/or Department of Parks and Recreation (DPR) representative or County Landscape Architect.

H. Urban Forester Notification: Notify the Project Officer at least 72 hours prior to commencement of tree planting operations, so that the County's Urban Forester can be present on-site to observe the work.

I. The Contractor shall provide a minimum of seven (7) business days' notice to the Project Officer prior to installing the plant material (this is not the same as inspection notification).

J. At the request of the Project Officer in coordination with the Urban Forester or Landscape Architect, the Contractor shall supply information specifying the provenance of the plant material. Provenance is the geographical origin of the seed or cutting used in propagation and can have a direct effect on plant vigor and survivability.

K. Inspections:

a. Urban Forester may perform periodic inspections to check on tree plantings.

b. Contractor shall arrange a meeting on site with the Project Officer in coordination with the Urban Forester and/or Landscape Architect to perform final inspection of plantings. Refer to section 1.07 "Final Inspection."

1.05 WORKMANSHIP

B. Any tree pruning shall conform to the most current version of ANSI A-300 Standard Practices for Trees, Shrubs, and Other Woody Plant Maintenance. Do not prune trees and shrubs before delivery.

C. Protect bark, branches, and root systems from sun-scald, drying, sweating, whipping, and other handling and tying damage. Do not bend or bind-tie trees or shrubs in such a manner as to destroy their natural shape. Provide protective covering of exterior plants during

delivery. Do not drop exterior plants during delivery. Plants shall not be bound with wire or rope at any time so as to damage the bark or break branches. Plants shall be handled from the bottom of the root ball only.

D. All plants in transit shall be tarped or covered and shall be kept from drying out. Desiccation damage shall be cause for rejection. Plants damaged in handling or transportation may be rejected by the Project Officer with confirmation by the Urban Forester/Landscape Architect. Any tree or shrub found to have wounds over 12.5% of the circumference of any limb or trunk, or over 1 inch in any direction, whichever is smaller, shall be rejected.

E. Deliver exterior plants after preparations for planting have been completed and install immediately. If planting is delayed more than six hours after delivery, set exterior plants trees in shade, protect from weather and mechanical damage, and keep roots moist. Plants shall not remain unplanted for longer than a three-day period after delivery. Any plants not installed during this time period shall be rejected, unless Project Officer and contractor provide otherwise by written agreement. All plants kept on site for any period of time shall be watered and cared for using ANSI A300 standards.

F. Plants shall be installed immediately following excavation of the hole. No holes shall remain open overnight. The Contractor shall cover and barricade any open holes to effectively prevent any danger of injury to pedestrians.

G. During delivery and installation, the landscape contractor shall perform in a professional manner, coordinating his/her activities so as not to interfere with the work of other trades, and leaving his/her work area(s) clean of litter and debris at the close of each workday.

H. During planting, all areas shall be kept neat and clean, and precautions shall be taken to avoid damage to existing plants, trees, turf and structures. Where existing trees are to be preserved, additional precautions shall be taken to avoid unnecessary accumulation of excavated materials, soil compaction, or root damage. The Contractor shall cover sidewalks or pavers with plywood, and cover turf with plywood, burlap or tarp during excavation.

I. Any damaged areas caused by the Contractor shall be restored to their original condition at no cost to the County. All debris and waste material, including small stones and clumps of clay or dirt exceeding 1” by 1” in any direction, resulting from planting operations shall be removed from the project, legally disposed, and the area cleaned up by the Contractor.

J. Plants with soil covering the root flare, if not removed by Contractor, shall be rejected by Project Officer with confirmation by Landscape Architect or Urban Forester.

K. Contractor shall take full responsibility for any cost incurred due to damage of utilities by their operations.

L. The Contractor shall not be held responsible for uncommon concealed conditions such as concrete/asphalt/stone spoils encountered in excavation work which are not apparent at the time of bidding. Rocks, tree roots and hard clay are common elements of “urban” soils and shall frequently be encountered in the execution of the contract.

M. No plants shall be planted in locations where drainage may, in the opinion of the Contractor, be unacceptable. Such situations shall be brought to the attention of the Project Officer before work continues and, if deemed necessary by the Project Officer with confirmation by the Landscape Architect/Urban Forester, the plants shall be relocated or the contract shall be modified to allow for drainage correction at a negotiated cost. Any such modification shall be in writing and signed by both parties.

N. The Contractor shall layout plants according to the project's landscape plan. The Project Officer shall approve the layout with confirmation by the Landscape Architect prior to plant installation. Plants installed without layout approval from the Project Officer with confirmation by Landscape Architect are subject to removal and replanting by the Contractor at no additional cost to Arlington County.

1.06 WATER REQUIREMENTS

A. Initial Waterings: The Contractor shall supply water for all plantings and shall water all plants at time of installation and 48 hours after installation, even if it is raining. Contractor shall then water plantings at least twice per week at amounts specified below until final acceptance of work.

B. Each watering shall consist of:

a. 20 gallons per individual tree

b. 4 gallons per individual shrub

c. 1 gallon per 1 sq. yd. of shrub or perennial bed

d. 1 gallon per 3 sq. yd. of seed or sod

C. Once final acceptance is completed, Contractor shall have no obligation to water all plantings and the one (1) year planting warranty

1.07 FINAL INSPECTION

A. Contractor shall schedule the final inspection with the Project Officer in coordination with the Urban Forester and/or Landscape Architect.

a. Contractor shall notify Project Officer at least one week in advance to arrange final inspection meeting with the Urban Forester and/or Landscape Architect.

b. Contractor shall conduct the final inspection of the landscape materials no less than three months after the installation of the plants or substantial completion of construction work, whichever comes last, and in the presence of the Project Officer, the Urban Forester and/or Landscape Architect.

c. The landscaping inspection shall review all landscape work under the contract.

d. All plants shall be alive and in good health at the time of final inspection.

e. Any plant material that is 25% dead or more shall be considered dead and shall be replaced at no charge to the County. A tree shall be considered dead when the main leader has died back, or 25% of the crown is dead.

f. It shall be the Contractor's responsibility to provide in writing the results of this inspection.

g. The Contractor shall make replacements during the next planting period unless the County specifies an earlier date.

h. The replacement plants shall be reviewed for final acceptance no less than three months after installation. Contractor is responsible for maintenance and watering of replacement material per Section 1.06 and Section 1.08 after planting and until the replacement plantings are finally accepted by Project Officer.

i. A replacement plant shall be of the same size as the original plant with no additional soil additives to be used.

j. The Contractor shall not be responsible for plants that have been damaged by vandalism, fire, removal or other activities beyond the control of the Contractor.

1.08 MAINTENANCE

A. Trees, Shrubs, Perennials, Bulbs & Groundcovers: Contractor shall maintain plantings at his/her own expense until final acceptance of the plantings as specified herein section 1.07.

B. Maintenance shall include pruning, mulching, cultivating, watering, weeding, fertilizing, tightening and repairing stakes and guy supports, and resetting to proper grades or vertical position, as required to establish healthy, viable plantings.

C. Pruning: Remove all sucker growth, dead or broken branches at initial planting and as needed during the warranty period. Pruning shall conform to ANSI-300 Tree Pruning Standards.

D. Fertilizing: No plants shall be fertilized without prior approval of Project Officer with confirmation by the Urban Forester or Landscape Architect.

E. Mulching: Contractor shall re-mulch areas to a depth of two to three inches prior to final acceptance if the time between planting and final acceptance extends beyond six months. Mulch shall be of the same quality as mulch provided at the time of planting. Keep mulch six-inches away from trunks of trees and shrubs.

F. Weeding: Contractor shall perform weeding until final acceptance to keep the planting area as free of weeds as possible. A minimum of one weeding per month from April through October is required if time between planting and final acceptance extends through any months of the growing season.

G. Stakes and Guy Supports: If installed, Contractor shall monitor and adjust all stakes and guy supports until final acceptance.

PART 2 - PRODUCTS

2.01 EXTERIOR PLANTS

PRODUCT DATA SHEET 0 - Contractor shall select plants only from nurseries that have been inspected by state or federal agencies and shall have been grown in USDA Plant Hardiness Zones 4, 5, 6, or 7, and in one of the following states: Maryland, Virginia, Delaware, New Jersey, North Carolina or Pennsylvania.

PRODUCT DATA SHEET 1 - Tree and Shrub Material: Furnish nursery-grown trees and shrubs complying with ANSI Z60.1, with healthy root systems developed by transplanting or root pruning. Provide well-shaped, fully branched, healthy, vigorous stock free of disease, insects, eggs, larvae, and defects such as knots, sun-scald, injuries, abrasions, and disfigurement.

a. Provide balled and burlapped, bare root or container-grown trees and shrubs, as indicated on the Drawings.

b. Balled and Burlapped (B&B) plants shall be dug with firm root balls of earth and free of noxious weeds. There shall be no extra soil on top of the root ball or around the trunk. Balled and burlapped trees shall be securely held in place by untreated burlap and stout rope. Nylon rope is NOT acceptable. Loose, broken or manufactured balls are unacceptable.

c. Ball sizes shall be in accordance with current ANSI standards.

d. In size-grading B&B single stem trees, caliper shall take precedence over height. For multiple-trunk trees, height measurement shall take precedence over caliper.

e. Trees over 1” in caliper shall have a strong central leader (free and clear of branches or splits in the trunk) from the top of the root ball to a height of at least 6’-6”. Only minimal bends in the trunk shall be acceptable. Co-dominant stems and V-crotches shall be cause for rejection.

f. The root system of container-grown plants shall be well developed and well distributed throughout the container.

g. All container-grown trees and shrubs that have circling and matted roots shall be rejected.

PRODUCT DATA SHEET 2 - Perennials: Provide healthy, container-grown plants with well-developed, fibrous root systems from a commercial nursery, of species and variety shown in the Drawings. All container grown plants shall be healthy, vigorous, well rooted and established in the container in which they are growing. A container grown plant shall have a well-established root system reaching the sides of the container to maintain a firm root ball, but shall not have excessive root growth outside the container.

PRODUCT DATA SHEET 3 - Bulbs: Provide top size bulbs as indicated on plan in accordance with most current version of ANSI A60 specification.

PRODUCT DATA SHEET 4 - Field grown trees and shrubs shall be grown in soils of the Piedmont region, or west of that region in the above approved states and zones.

F. All plant materials shall be labeled by grower to identify genus, species, and cultivar, if applicable, in accordance with Section 1.04 "Quality Assurance," above.

G. Bare root plant materials: Bare root plants shall be dug with adequate fibrous roots. Do not root prune. Roots shall be protected during handling and planting to guard against drying out and damage.

H. Plant Materials for ecologically sensitive areas: Plant materials identified on planting plan as being located within an Arlington County Natural Resource Conservation Area (NCRA) shall be native species of local provenance.

a. Plant stock shall originate from a location within 150 miles of Arlington County.

2.02 OTHER MATERIALS

A. Refer to Section 329200 "Seeding and Sodding" for specifications for seeding, specialty seeding, sodding, and soil stabilization/erosion control fabric.

B. Refer to Section 329100 "Planting Preparation" for specifications for soils, mulch, soil amendments and other items related to planting preparation.

PART 3 - EXECUTION

3.01 EXTERIOR PLANTING

A. Contractor shall install plant materials in accordance with the current Arlington County Standard Planting Details as published on the Arlington County website and as specified below.

B. Refer to Section 329100 "Planting Preparation" for specifications on soil amendments.

a. Remove existing sod, turf, weeds or other plant material.

b. Rototill subgrade of planting beds to a minimum depth of 8 inches with the addition of 3 inches organic material. Edge and rake the entire planting bed.

c. Remove stones, clods, debris, sticks, roots and other foreign or extraneous matter larger than 1/2 inch in any dimension. Contractor shall legally dispose of them off Arlington County property.

d. Thoroughly blend planting soil mix off-site before spreading or spread topsoil, apply soil amendments and fertilizer on surface, and thoroughly blend planting soil mix.

e. Spread planting soil mix to a depth of 8 inches but not less than required to meet finish grades after natural settlement. Do not spread if planting soil or subgrade is frozen, muddy, or excessively wet.

f. Finish Grading: Grade planting beds to a smooth, uniform surface plane with loose, uniformly fine texture. Roll and rake, remove ridges, and fill depressions to meet finish grades.

g. Planting operations shall be performed during periods within the planting season when weather and soil conditions are suitable and in accordance with accepted local practice. Plants shall not be installed in top soil that is in muddy or frozen condition. **Lawns, trees and shrubs shall be installed between 03/15 and 06/15**

h. **or between 09/15 and 12/01.** If a project completion is outside of this planting period, contact the Arlington County Urban Forester to obtain a deferral or approval for planting out of season.

C. Plant Layout

a. The Contractor shall layout and space plants according to the project landscape plan.

b. When the layout is complete, the Contractor shall notify the Project Officer for approval with confirmation by the Landscape Architect prior to installation of the plants.

D. Landscape Plantings (Trees, Shrubs, Ground Covers and Perennials)

a. Contractor shall install plantings in accordance with Arlington County DPR standard details available online on the Arlington County Website. Refer to plans for appropriate planting details.

b. Handling: Prepare pit and/or planting bed per standards. Place plant in pit by carrying by the root ball (not by branches or trunk) and plant per the DPR Standards. Make sure the plant remains plumb during the backfilling procedure.

E. Tree and Shrub Pruning: **Contractor shall conform to the most current version of ANSI A-300 Tree Pruning Standards. Do not cut tree leaders; remove only injured or dead branches from trees and shrubs, or those that pose a hazard to pedestrians.** Make all cuts back to a lateral branch or bud. Cuts should be perpendicular above branch collar. Final pruning shall be done after the tree is in place. Do not prune into old wood on evergreens.

F. Plant Protection: Contractor shall protect exterior plants from damage due to landscape operations, operations by other contractors and trades, and others. Maintain protection during installation and maintenance periods. Treat, repair, or replace damaged exterior planting. Injured roots shall be pruned to clean ends before planting with clean, sharp tools per most current ANSI 300 specifications.

a. Protect shrubs, groundcovers and perennials from hot sun and wind; remove protection if plants show evidence of recovery from transplanting shock.

G. Contractor shall remove all tags, labels, strings and wire from the plants, unless otherwise directed.

H. Contractor shall remove surplus soil and waste material, including excess subsoil, unsuitable soil, trash, and debris, and legally dispose of them off of Arlington County property.

I. Refer to Section 1.06 'Water Requirements.'

3.02 STAKING & GUYING TREES

A. Contractor shall stake and guy trees only if required by Urban Forester.

B. If staking and guying is required, the Contractor shall provide and install stakes and guying in accordance with DPR standard staking details for deciduous and evergreen trees.

PART 4 – MEASUREMENT AND PAYMENT

4.01 The measurement of PLANT to be paid for under this item shall be the number of EACH type of furnished and installed plant in accordance with the approved plans and specifications.

4.02 The unit price for each PLANT shall include the cost of all labor, materials, and other expenses necessary to complete the work, including but not limited to required waterings (at time of planting and second watering for each plant 48 hours after installation), and maintenance and watering necessary to keep plants healthy until final acceptance as described herein, in accordance with the approved plans and specifications.

4.03 When explicitly specified in plans, the measurement of STAKING AND GUYING to be paid for under this item shall be the number of EACH to furnished and installed at individual trees in accordance with the approved plans and specifications.

4.04 The unit price for STAKING AND GUYING shall include the cost of all labor, materials, and other expenses necessary to complete the work in accordance with the approved plans and specifications.

4.05 Unless otherwise specified on the project drawings, supplemental specifications or special conditions, excavation is considered incidental to the work and therefore no separate payments shall be made for excavation.

TYPICAL SECTION

NOTES :

1. WHEN THE DISTANCE FROM THE EDGE OF EXISTING PAVEMENT TO THE EDGE OF THE PAVEMENT RESTORATION PAYMENT WIDTH IS 3' OR LESS THEN THE ADDITIONAL PAVEMENT SHALL BE REMOVED AND REPLACED BACK TO THE EDGE.
2. THICKNESS OF BASE MAY BE REDUCED TO 3" WHEN PATCH IS BEING MADE IN PAVEMENTS OF SURFACE TREATED GRAVEL, AND DIRECTED BY THE PROJECT OFFICER.
3. WHEN WIDENING OR PATCHING A STREET WITH ASPHALT, A NEAT, CLEAN JOINT OF AT LEAST ONE (1) INCH IN DEPTH BETWEEN OLD AND NEW PAVEMENT SHALL BE PROVIDED FOR TOPPING SO AS TO ELIMINATE THE NEED FOR FEATHERING OF THE OVERLAY.
4. FOR TRENCH AND BEDDING DETAILS, SEE DRAWING No. M-3.0.

STANDARD PAVEMENT RESTORATION FOR UTILITY CUTS		
	1	8/12/19
	REVISION & DATE	
ARLINGTON VIRGINIA	ARLINGTON COUNTY, VIRGINIA DEPARTMENT OF ENVIRONMENTAL SERVICES	DRAWING NO. M-6.0

TYPICAL SECTION

NOTES :

1. THIS DETAIL SHALL BE REQUIRED ON UTILITY CUTS IN COUNTY STREETS PAVED WITHIN 5 YEARS OF DATE OF ISSUANCE OF PERMIT.
2. WHERE PRACTICAL, LIMITS OF 12 FOOT WIDE OVERLAY SHALL CORRESPOND WITH TRAVEL LANES AS DIRECTED BY THE PROJECT OFFICER.
3. WHEN THE DISTANCE FROM THE EDGE OF EXISTING PAVEMENT TO THE EDGE OF THE PAVEMENT RESTORATION WIDTH IS 3' OR LESS, THE ADDITIONAL PAVEMENT SHALL BE REMOVED AND REPLACED BACK TO THE EDGE.
4. THICKNESS OF BASE MAY BE REDUCED TO 3" WHEN PATCH IS BEING MADE IN PAVEMENTS OF SURFACE TREATED GRAVEL, AND DIRECTED BY THE PROJECT OFFICER.
5. WHEN WIDENING OR PATCHING A STREET WITH ASPHALT, A NEAT, CLEAN JOINT OF AT LEAST ONE (1) INCH IN DEPTH BETWEEN OLD AND NEW PAVEMENT SHALL BE PROVIDED FOR TOPPING SO AS TO ELIMINATE THE NEED FOR FEATHERING OF THE OVERLAY.
6. FOR TRENCH AND BEDDING DETAILS, SEE DRAWING No. M-3.0.

MODIFIED PAVEMENT PATCHING
FOR UTILITY CUTS ON NEWLY PAVED STREET

1	8/12/19
REVISION & DATE	

ARLINGTON
VIRGINIA

ARLINGTON COUNTY, VIRGINIA
DEPARTMENT OF ENVIRONMENTAL SERVICES

DRAWING NO.
M-6.1