NOTICE OF AWARD OF CONTRACT

TO: ARTHUR CONSTRUCTION CO, INC
23691 OVERLAND DR
DULLES VA 20166

DATE ISSUED: APRIL 27, 2015
CURRENT CONTRACT NO: 562-14
CONTRACT TITLE: ON-CALL CONCRETE WORK
PRIOR CONTRACT NO: 51-11

THIS IS A NOTICE OF AWARD OF CONTRACT AND NOT AN ORDER. NO WORK IS AUTHORIZED UNTIL THE VENDOR RECEIVES A VALID COUNTY PURCHASE ORDER ENCUMBERING CONTRACT FUNDS.

Your firm is awarded the above referenced contract in accordance with the response submitted by you on MARCH 10th, 2015. The contract term covered by this Notice of Award is effective IMMEDIATELY and expires on MARCH 31, 2018.

This is the FIRST award notice, which covers the first THREE years of a possible FIVE year contract.

The contract documents consist of the terms, conditions, and specifications of Invitation to Bid No. 562-14 and the bid of the Contractor, incorporated herein by reference.

CONTRACT PRICING:
1) REFER TO EXHIBIT D FOR UNIT PRICE BID OF THE CONTRACTOR (ATTACHED)
2) PRICE ADJUSTMENTS FOR EXTENSION OPTIONS BASED ON ENGINEERING NEWS RECORD CONSTRUCTION COST INDEX (CCI), PRICE ADJUSTMENT MONTH IS OCTOBER

ATTACHMENTS:
1) ARLINGTON COUNTY INVITATION TO BID NO 562-14
2) CONTRACTOR'S UNIT PRICE BID

EMPLOYEES NOT TO BENEFIT:
NO COUNTY EMPLOYEE SHALL RECEIVE ANY SHARE OR BENEFIT OF THIS CONTRACT NOT AVAILABLE TO THE GENERAL PUBLIC.

VENDOR CONTACT: JOE ARAUJO
TELEPHONE NO.: 703-996-1155
EMAIL ADDRESS: JOEARAUJO@ARTHURCONSTR.COM

COUNTY CONTACT: RAMZI AWAD
TELEPHONE NO.: 703-228-3721
EMAIL ADDRESS: RAMWAD@ARLINGTONVA.US

CONTRACT AUTHORIZATION

Maria Meredith
Acting Purchasing Agent

DISTRIBUTION
VENDOR: 1
BID FOLDER: 2
AGREEMENT NO. 562-14

THIS AGREEMENT is made, on the date of execution by the County, between Arthur Construction Co., Inc ("Contractor") a Virginia Corporation authorized to do business in the Commonwealth of Virginia, and the County Board of Arlington County, Virginia (County). The County and the Contractor, for the consideration hereinafter specified, agree as follows:

1. CONTRACT DOCUMENTS
The Contract Documents consist of:

- Agreement No. 562-14, and all modifications properly incorporated into the Agreement
- Exhibit A - NOT USED
- Exhibit B - Arlington County Invitation to Bid No. 562-14, including General Conditions, Special Conditions, and Supplementary Specifications
- Exhibit C - The Arlington County Department of Environmental Services’ Standards and Specifications, Current Edition
- Exhibit D - Unit price bid of the 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 shall prevail over the other Contract Documents.

Exhibits A, B, and C are considered complementary documents, what is in one shall be considered as in all; where the terms of these Contract Documents vary the most stringent shall apply; and Exhibits A, B, and C shall prevail over Exhibit D.

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 of them has made any representation or promise with respect to the parties’ Agreement which is not contained in the Contract Documents. The Contract Documents may be referred to herein as the "Contract" or "Agreement."

2. PROJECT OFFICER
The performance of the Contractor is subject to the general control, review and approval of the County Project Officer, who shall be appointed by the Director of the Arlington County Department of Environmental Services or designee. The Contractor shall not comply with requests and/or orders issued by other than the Project Officer of designee. However, it shall be the responsibility of the Contractor to manage the details of the execution and performance of its Work under this Agreement. Where the term "Engineer" is used in the Contract Documents, it shall be interpreted to mean "Project Officer".

Arlington County Agreement 562-14
3. **SCOPE OF WORK**

The Contractor will furnish all labor, materials, and equipment for the construction of larger scale public works infrastructure and street improvement projects including construction, reconstruction, and maintenance of: State and County streets, curbs & gutters, sidewalks, walkways, driveway aprons, storm sewer pipes and inlets, pavement markings and signage, electrical conduits, traffic controls, streetscapes, and related site work (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 obligation of the Contractor to obtain clarification from the Project Officer concerning any questions about or conflicts in the specifications, drawings and construction notes in a timely way so as not to delay the progress of the Work. The Contract Documents set forth the minimum Work estimated by the County and the Contractor to be necessary to complete the Work. 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.

4. **CONTRACT TERM**

The term of this Agreement will commence on the date of execution by the County, and shall be completed no later than **March 31st, 2018**, subject to any written modifications as provided for in the Contract Documents. Upon satisfactory performance by the Contractor, the County may, through issuance of a Notice of Award, authorize continued operations of the Contractor for not more than **two (2) additional twelve (12) month periods**.

5. **CONTRACT AMOUNT**

The Contract unit price(s) shall remain firm for **twelve (12) months from the date of execution by the County** ("Price Adjustment Date"). To request a price adjustment, the Contractor or the County must submit a written request to the other party not less than sixty (60) days prior to the Price Adjustment Date. Requests for adjustment(s) to unit price(s) shall not exceed the percentage of escalation / de-escalation in the Engineering News Record (ENR) Construction Cost Index (CCI), 20-city average, ending in October of each year of the Contract.

If the Contractor and the County do not agree on the requested adjustment using the procedure set forth above, by the thirtieth (30th) calendar day prior to the Price Adjustment Date, the County may in its sole discretion terminate the Contract. The contract unit price(s) that changed as a result of this procedure shall become effective the day after the Price Adjustment Date and shall be binding on both parties for 12 months following the adjustment which shall be considered the new Price Adjustment Date.

6. **PAYMENT TERMS**

Payment terms will be recorded by the County as net thirty (30) days. The County will pay the Contractor within thirty (30) days after the date of receipt of a correct (as determined by the Project Officer) invoice approved by the Project Officer describing completed work which is reasonable and allocable to the Contract, or the date of receipt of the entire order, or the date of acceptance of the work which meets the Contract requirements,
whichever is later. Payments will be made by the County for goods or services furnished, delivered, inspected, and accepted upon receipt of invoices submitted on the date of shipment or delivery of service, subject to applicable payment terms. The number of the Purchase Order pursuant to which authority shipments have been made or services performed shall appear on all invoices. Invoices shall be submitted in duplicate. Unless otherwise specified by the Contract Documents, payment shall not be made prior to delivery and acceptance of the entire order by the County.

7. **PAYMENT OF SUBCONTRACTORS**
The Contractor is obligated to take one of the two following actions within seven (7) calendar days after receipt of amounts paid to the Contractor 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 (7) calendar 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 shall accrue at the rate of one percent (1%) per month.

The Contractor shall 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 as those contained herein 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.

8. **RELEASE AND REQUEST FOR FINAL PAYMENT**
Upon completion of the Project and before Final Acceptance, the Contractor will submit to the Project Officer a signed copy of the Arlington County Release and Request for Final Payment form per the General Conditions.

9. **LIQUIDATED DAMAGES**
The County specifies that time is of the essence under this Contract. Time being of the essence, it is essential to the County that Contract work be completed within the Contract Term. The County and the Contractor agree that damages for failure to complete the work within the Contract Term are not susceptible to exact determination but that $580 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 on demand $580 per day for each and every calendar day that the Contractor has not obtained Final Completion beyond the Contract Term as damages caused by such delay and not as a penalty. The County shall 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 to the validity of any liquidated damages stated in this Agreement as they may appear on grounds that such liquidated damages are void as penalties or are not reasonably related to actual damages.

10. NON-APPROPRIATION
All funds for 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. In the event of non-appropriation of funds by the County Board of Arlington County, Virginia for the services provided under this Contract or substitutes for such services which are as advanced or more advanced in their technology, the County will terminate the Contract, without termination charge or other liability to the County, on the last day of the then-current fiscal year or when the appropriation made for the then-current year for the services covered by this Contract is spent, whichever event occurs first. If funds are not appropriated at any time for the continuation of this Contract, cancellation will be accepted by the Contractor on thirty (30) days prior written notice, but failure to give such notice shall be of no effect and the County shall not be obligated under this Contract beyond the date of termination specified in the County’s written notice.

11. ESTIMATED QUANTITIES/NON-EXCLUSIVITY OF CONTRACTOR
During the Contract Term, the Contractor will furnish all of the goods or services described in the Contract Documents, if so requested by the County. The County will have no obligation to the Contractor if no, or fewer, items or services are required or requested by the County. Any quantities which are included in the Contract Documents are the present expectations of those who are planning for the County for the period of the Contract. The amount is only an estimate and the Contractor understands and agrees that the County is under no obligation to the Contractor to buy that amount, or any amount as a result of having provided this estimate or of having had any normal or otherwise measurable requirement in the past. The Contractor further understands that the County may require goods and/or services in excess of the estimated annual contract amount and that such excess shall not give rise to any claim for compensation other than at the unit prices and/or rates set forth in this Contract. Further, the items or services covered by this contract may be available or become available under other County contracts, and in analyzing its needs, the County may determine that it is in its best interest to procure the items or services through such another contract. Therefore, the County does not guarantee that the Contractor will be the exclusive provider of the goods or services covered by this contract.

12. COUNTY PURCHASE ORDER REQUIREMENT
County purchases are authorized only if a County Purchase Order is issued in advance of the transaction, indicating that the ordering agency has sufficient funds available to pay for the purchase. Such a Purchase Order is to be provided to the Contractor by the ordering agency. The County will not be liable for payment for any purchases made by its employees without appropriate purchase authorization issued by the County Purchasing Agent. If the Contractor provides services without a signed County Purchase Order, it does so at its own risk and expense.
13. **LIEN**  
It is expressly agreed that after any payment has been made by the County  
either to the Contractor or to any subcontractor, laborer, or any other  
person 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 any subcontractor, 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 this Contract, the Contractor agrees as follows:

a. The Contractor will not discriminate against any employee or  
applicant for employment because of race, religion, color, sex,  
national origin, age, disability, or any other basis prohibited  
by federal or Virginia law related to discrimination in  
employment except where there is a bona fide occupational  
qualification reasonably necessary or related to the normal  
operation of the Contractor. 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. The Contractor, in all solicitations or advertisements for  
employees placed by or on behalf of the Contractor, will state  
that the Contractor is an Equal Opportunity Employer.

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

d. The Contractor will comply with the provisions of the Americans  
with Disabilities Act of 1990 which prohibits discrimination  
against individuals with disabilities in employment, and mandates  
their full participation in both publicly and privately-provided  
services and activities.

e. The Contractor will include the provisions of the foregoing  
paragraphs in every subcontract or purchase order of over  
$10,000.00, so that these provisions will apply to each  
subcontractor or vendor.

15. **EMPLOYMENT OF UNAUTHORIZED AliENS PROHIBITED**  
In accordance with § 2.2-4311.1 of the Code of Virginia, 1950, as amended,  
the Contractor acknowledges that it does not, and shall not during the  
performance of this Contract, knowingly employ an unauthorized alien as that  

16. **DRUG-FREE WORKPLACE TO BE MAINTAINED BY CONTRACTOR**  
During the performance of this Contract, the Contractor agrees to (i) provide  
a drug-free workplace for the Contractor’s employees; (ii) post in  
conspicuous places, available to employees and applicants for employment, a  
statement notifying employees that the unlawful manufacture, sale,  
distribution, dispensation, possession, or use of marijuana or any other  
controlled substance is prohibited in the Contractor’s workplace, and  
specifying the actions that will be taken against employees for violations of  
such prohibition; (iii) state in all solicitations or advertisements for  
employees placed by or on behalf of the Contractor that the Contractor
maintains a drug-free workplace; and (iv) include the provisions of the
foregoing clauses in every subcontract or purchase order of over $10,000.00
relating to this Contract, so that the provisions will be binding upon each
subcontractor or vendor.

For the purposes of this section, "drug-free workplace" means a site for the
performance of work done in connection with a specific contract awarded to a
contractor by Arlington County, the employees of whom are prohibited from
engaging in the unlawful manufacture, sale, distribution, dispensation,
possession or use of any controlled substance or marijuana during the
performance of the contract.

17. **PROJECT STAFF**
The County will, throughout the Contract Term and any renewal 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 must 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 shall be solely the responsibility of the Contractor.

18. **FAILURE TO DELIVER**
In case of failure to deliver goods or services in accordance with the
Contract terms and conditions, the County, after due oral or written notice,
may procure the goods or services from other sources and hold the Contractor
responsible for any resulting additional purchase and administrative costs;
provided, that if public necessity requires the use of materials or supplies
not conforming to the specifications, they may be accepted and payment
therefore shall be made at a reduction in price to be determined solely by
the County. This remedy shall be in addition to any other remedies, which
the County may have. The County shall be entitled to offset such costs
against any sums owed by the County to the Contractor.

19. **UNSATISFACTORY WORK**
If any of the work done, or material, goods, or equipment provided, by the
Contractor is unsatisfactory to the County, the Contractor shall, on being
notified by 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. In the event
the Contractor fails within fifteen (15) calendar days after receipt of
written notice to remove improper or unsuitable work, material, goods, or
equipment and replace it with suitable and satisfactory work, material,
goods, or equipment, the County shall have the right, but not the obligation,
to remove or replace the rejected work, material, goods, or equipment at the
expense of the Contractor. This paragraph applies during the Contract term
and during any warranty or guarantee period. At its discretion, the County
shall be entitled to offset such expense against any sums owed by the County
to the Contractor under this Contract. If the Project Officer and the County
decide that it is expedient not to require correction or replacement of the work which
has not been done in accordance with the Contract, an appropriate adjustment
to the Contract Amount may be made therefor.

20. **TERMINATION FOR CAUSE, INCLUDING BREACH AND DEFAULT; CURE**
The County shall have the right to terminate this Contract prior to the end
of the Contract Term if the Contractor is in breach or default or has failed
to perform satisfactorily the Work required, as determined by the County in
its discretion.
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 such failure(s) at least fifteen (15) calendar days before termination of the Contract takes effect ("Cure Period"). If the Contractor fails to cure within the Cure Period or as otherwise specified in the notice, the Contract may be terminated for the Contractor's failure to provide satisfactory Contract performance. Upon such termination, the Contractor may apply for compensation for Contract services satisfactorily performed by the Contractor and allocable to the Contract and accepted by the County prior to such termination unless otherwise barred by the Contract ("Termination Costs"). In order to be considered, such request for Termination Costs, with all supporting documentation, must be submitted to the County Project Officer within fifteen (15) calendar days after the expiration of the Cure Period. The County may accept or reject, in whole or in part, the application for Termination Costs and notify the Contractor of same within a reasonable time thereafter.

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

Upon any termination pursuant to this section, the Contractor shall be liable to the County for all costs incurred by the County after the effective date of termination, including costs required to be expended by the County to complete the Work covered by the Contract, including costs of delay in completing the Work or the cost of repairing or correcting any unsatisfactory or non-compliant work performed or provided by the Contractor or its subcontractors. Such costs shall be either deducted from any amount due the Contractor or shall be promptly paid by the Contractor to the County upon demand by the County. Additionally, and notwithstanding any provision in this Contract to the contrary, the Contractor is liable to the County, and the County shall be entitled to recover, all damages to which the County is entitled by this Contract or by law, including and without limitation, direct damages, indirect damages, consequential damages, delay damages, replacement costs, refund of all sums paid by the County to the Contractor under the Contract and all attorney fees and costs incurred by the County to enforce any provision of this Contract.

Except as otherwise directed by the County in the notice, the Contractor shall stop work on the date of receipt of notice of the termination or other date specified in the notice, place no further orders or subcontracts for materials, services, or facilities except as are necessary for the completion of such portion of the Work not terminated, and terminate all vendors and subcontractors and settle all outstanding liabilities and claims. Any purchases after the date of termination contained in the notice shall be the sole responsibility of the contractor.

In the event any termination for cause, default, or breach shall be found to be improper or invalid by any court of competent jurisdiction then such termination shall be deemed to have been a termination for convenience.

21. **TERM**INATION FOR THE CONVENIENCE OF THE COUNTY
The performance of Work under this Contract may be terminated by the County Purchasing Agent in whole or in part whenever the Purchasing Agent shall...
determine that such termination is in the County's best interest. Any such termination shall be effected by the delivery to the Contractor of a written notice of termination at least fifteen (15) calendar days before the date of termination, specifying the extent to which performance of the work under this Contract is terminated and the date upon which such termination becomes effective. The Contractor will be entitled to receive compensation for all Contract services satisfactorily performed by the Contractor and allocable to the Contract and accepted by the County prior to such termination and any other reasonable termination costs as negotiated by the parties, but no amount shall be allowed for anticipatory profits.

After receipt of a notice of termination and except as otherwise directed, the Contractor shall stop all designated work on the date of receipt of the notice of termination or other date specified in the notice; place no further orders or subcontracts for materials, services or facilities except as are necessary for the completion of such portion of the work not terminated; immediately transfer all documentation and paperwork for terminated work to the County; and terminate all vendors and subcontracts and settle all outstanding liabilities and claims.

22. **INDEMNIFICATION**
The Contractor covenants for itself, its employees, and 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" for purposes of this section) from and against any and all claims made by third parties or by the County for any and all losses, damages, injuries, fines, penalties, costs (including court costs and attorney's fees), charges, liability, demands or exposure, however caused, 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 and/or subcontractors, in performance or nonperformance of the work called for by the Contract Documents. This duty to save, defend, hold harmless and indemnify shall survive the termination of this Contract. If, after notice by the County, the Contractor fails or refuses to fulfill its obligations contained in this section, the Contractor shall be liable for and reimburse the County for any and all expenses, including but not limited to, reasonable attorneys' fees incurred and any settlements or payments made. The Contractor shall pay such expenses upon demand by the county and failure to do so may result in such amounts being withheld from any amounts due to Contractor under this Contract.

23. **INTELLECTUAL PROPERTY INDEMNIFICATION**
The Contractor warrants and guarantees that no intellectual property rights (including, but not limited to, copyright, patent, mask work and trademark) of third parties are infringed or in any manner involved in or related to the services provided hereunder.

The Contractor further covenants for itself, its employees, and subcontractors to save, defend, hold harmless, and indemnify the County, and all of its officers, officials, departments, agencies, agents, and employees from and against any and all claims, losses, damages, injuries, fines, penalties, costs (including court costs and attorney's fees), charges, liability, or exposure, however caused, for or on account of any trademark, copyright, patented or unpatented invention, process, or article manufactured or used in the performance of this Contract, including its use by the County. If the Contractor, or any of its employees or subcontractors, uses any
design, device, or materials covered by letters patent or copyright, it is mutually agreed and understood, without exception, that the Contract Amount includes all royalties, licensing fees, and any other costs arising from the use of such design, device, work, or materials in any way involved with the work hereunder. This duty to save, defend, hold harmless and indemnify shall survive the termination of this Contract. If, after Notice by the County, the Contractor fails or refuses to fulfill its obligations contained in this section, the Contractor shall be liable for and reimburse the County for any and all expenses, including but not limited to, reasonable attorneys’ fees incurred and any settlements or payments made. The Contractor shall pay such expenses upon demand by the county and failure to do so may result in such amounts being withheld from any amounts due to Contractor under this Contract.

24. COPYRIGHT
The Contractor hereby irrevocably transfers, assigns, sets over and conveys to the County all right, title and interest, including the sole exclusive and complete copyright interest, in any and all copyrightable works created pursuant to this Contract. The Contractor further agrees to execute such documents as the County may request to effect such transfer or assignment.

Further, the Contractor agrees that the rights granted to the County by this paragraph are irrevocable. Notwithstanding anything else in this Contract, the Contractor's remedy in the event of termination of or dispute over the terms of this Contract shall not include any right to rescind, terminate or otherwise revoke or invalidate in any way the rights conferred pursuant to the provisions of this paragraph. Similarly, no termination of this Contract shall have the effect of rescinding, terminating or otherwise invalidating the rights acquired pursuant to the provisions of this "Copyright" paragraph.

The use of subcontractors or third parties in developing or creating input into any copyrightable materials produced as a part of this Contract is prohibited unless the County approves the use of such subcontractors or third parties in advance and such subcontractors or third parties agree to include the provisions of this paragraph as part of any contract they enter into with the Contractor for work related to work pursuant to this Contract.

25. OWNERSHIP AND RETURN OF RECORDS
This Contract confers no ownership rights to the Contractor nor any rights or interests to use or to disclose the County’s data or inputs.

The Contractor agrees that all drawings, specifications, blueprints, data, information, findings, memoranda, correspondence, documents or records of any type, whether written or oral or electronic, and all documents generated by the Contractor or its subcontractors as a result of the County's request for services under this Contract, are the exclusive property of the County ("Record" or "Records"), and all such Records shall be provided to and/or returned to County upon completion, termination, or cancellation of this Contract. The Contractor shall not use, willingly allow, or cause such materials to be used for any other purpose other than performance of all obligations under the Contract without the written consent of the County. Additionally, the Contractor agrees that the Records are confidential records and neither the Records nor their contents shall be released by the Contractor, its subcontractors, or other third parties; nor shall their contents be disclosed to any person other than the Project Officer or his or her designee. The Contractor agrees that all oral or written inquiries from any person or entity regarding the status of any Record generated as a result
of the existence of this Contract shall be referred to the Project Officer or
his or her designee for response. At the County's request, the Contractor
shall deliver all Records to the Project Officer, including "hard copies" of
computer records, and at the County's request, shall destroy all computer
records created as a result of the County's request for services pursuant to
this Contract.

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

No termination of this Contract shall have the effect of rescinding,
terminating or otherwise invalidating this section.

26. CONFIDENTIAL INFORMATION
The Contractor, and its employees, agents, and subcontractors, hereby agree
to hold as confidential all County information obtained as a result of its
Work under this Contract. Confidential information includes, but is not
limited to, nonpublic personal information, personally identifiable health
information, social security numbers, addresses, dates of birth, other
contact information or medical information about a person, information
pertaining to products, operations, systems, customers, prospective
customers, techniques, intentions, processes, plans, expertise and any
information entrusted to any affiliate of the parties. The Contractor shall
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 any Virginia or federal law related to
ethics, conflicts of interest, or bribery, including, by way of illustration
and not limitation, the Virginia 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 offer was made without
collusion or fraud and 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 employee of the County shall be admitted to any share in any part of this
Contract or to any benefit that may arise therefrom which is not available to
the general public.

29. FORCE MAJEURE
The Contractor shall not be held responsible for failure to perform the
duties and responsibilities imposed by this Contract if such failure is due
to fires, riots, rebellions, natural disasters, wars, or an act of God beyond
the control of the Contractor and outside the scope of the Contractor's then
current, by industry standards, disaster plan that make performance
impossible or illegal, unless otherwise specified in the Contract.

Arlington County Agreement 562-14
The County shall not be held responsible for failure to perform its duties and responsibilities imposed by the Contract if such failure is due to fires, riots, rebellions, natural disasters, wars, or an act of God beyond the control of the County that make performance impossible or illegal, unless otherwise specified in the Contract.

30. **AUTHORITY TO TRANSACT BUSINESS**

The Contractor shall, pursuant to Code of Virginia §§ 2.2-4311.2, be and remain authorized to transact business in the Commonwealth of Virginia during the Initial Term and any Subsequent Contract Term(s) of this Contract. A contract entered into by a Contractor in violation of this requirement is voidable, without cost or expense, at the sole option of the County.

31. **RELATION TO THE COUNTY**

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

32. **ANTITRUST**

By entering into this Contract, the Contractor conveys, sells, assigns and transfers to the County all rights, title, and interest in and to all causes of action the Contractor may now have or hereafter acquire under the antitrust laws of the United States or the Commonwealth of Virginia, relating to the services purchased or acquired by the County under this Contract.

33. **REPORT STANDARDS**

Reports or written material prepared by the Contractor in response to the requirements of this Contract or a request of the Project Officer shall, unless otherwise provided for in the Contract, meet standards of professional writing established for the type of report or written material provided, shall be thoroughly researched for accuracy of content, shall be grammatically correct and not contain spelling errors, shall be submitted in a format approved in advance by the Project Officer, and shall be submitted for advance review and comment by the Project Officer. The cost of correcting grammatical errors, correcting report data, or other revisions required to bring the report or written material into compliance with these requirements shall be borne by the Contractor.

When submitting documents to the County, the Contractor shall comply with the following guidelines:

- All submittals and copies shall be printed on at least thirty percent **(30%) recycled-content** and/or tree-free paper;
- All copies shall be double-sided;
- Report covers or binders shall be recyclable, made from recycled materials, and/or easily removable to allow for recycling of report pages.
(reports with glued bindings that meet all other requirements are acceptable);

- The use of plastic covers or dividers should be avoided; and
- Unnecessary attachments or documents not specifically asked for should not be submitted, and superfluous use of paper (e.g. separate title sheets or chapter dividers) should be avoided.

34. **AUDIT**
The Contractor agrees to retain all books, records and other documents related to this Contract for at least five (5) years after final payment. The County or its authorized agents shall have full access to and the right to examine any of the above documents during this period and during the Initial Contract Term or any Subsequent Contract Term. The Contractor shall provide any documentation requested by the County within fifteen (15) calendar days of such request. If the Contractor wishes to destroy or dispose of records (including confidential records to which the County does not have ready access) within five (5) years after final payment, the Contractor shall notify the County at least thirty (30) days prior to such disposal, and if the County objects, shall not dispose of the records.

35. **ASSIGNMENT**
The Contractor shall not assign, transfer, convey, sublet, or otherwise dispose of any award, or any or all of its rights, obligations, or interests under this Contract, without the prior written consent of the County.

36. **AMENDMENTS**
Unless otherwise specified herein, this Contract shall not be amended except by written amendment executed by persons duly authorized to bind the Contractor and the County.

37. **ARLINGTON COUNTY PURCHASING RESOLUTION AND COUNTY POLICIES**
Notwithstanding any provision to the contrary herein, no provision of the Arlington County Purchasing Resolution or any applicable County policy is waived in whole or in part.

38. **DISPUTE RESOLUTION**
All disputes arising under this Agreement, or its interpretation, whether involving law or fact, extra work or extra compensation or time, and all claims for alleged breach of contract shall be submitted in writing to the Project Officer for decision at the time of the occurrence or beginning of the work upon which the claim is based, whichever occurs first. Any such claims shall state the facts surrounding it in sufficient detail to identify it together with its character and scope. 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 sixty (60) days after final payment. The time limit for final written decision by the County Manager in the event of a contractual dispute, as that term is defined in the Arlington County Purchasing Resolution, is thirty (30) days. Procedures for considering contractual claims, disputes, administrative appeals, and protests are contained in the Purchasing Resolution, which is incorporated herein by reference, and available upon request from the Office of the Purchasing Agent. The Contractor shall not cause a delay in the Work pending any decision of the Project Officer, County Manager, County Board, or a court of law.
39. **APPLICABLE LAW, FORUM, VENUE, AND JURISDICTION**
This Contract and the work performed hereunder shall be governed in all respects by the laws of the Commonwealth of Virginia, and the jurisdiction, forum, and venue for any litigation with respect hereto shall be in the Circuit Court for Arlington County, Virginia, and in no other court. In performing its work under this Contract, the Contractor shall comply with applicable federal, state, and local laws, ordinances and regulations.

40. **ARBITRATION**
It is expressly agreed that nothing under the Contract shall be subject to arbitration, and that any references to arbitration are expressly deleted from the Contract.

41. **NONEXCLUSIVITY OF REMEDIES**
All remedies available to the County under this Contract are cumulative, and no such remedy shall be exclusive of any other remedy available to the County at law or in equity.

42. **NO WAIVER**
The failure of either party to exercise in any respect a right provided for in this Contract shall not be deemed to be a subsequent waiver of the same right or any other right.

43. **SEVERABILITY**
The sections, paragraphs, sentences, clauses and phrases of this Contract are severable, and if any phrase, clause, sentence, paragraph or section of this Contract shall be declared invalid by a court of competent jurisdiction, such invalidity shall not affect any of the remaining phrases, clauses, sentences, paragraphs and sections of this Contract.

44. **NO WAIVER OF SOVEREIGN IMMUNITY**
Notwithstanding any other provision of this Contract, nothing in this Contract or any action taken by the County pursuant to this Contract shall constitute or be construed as a waiver of either the sovereign or governmental immunity of the County. The parties intend for this provision to be read as broadly as possible.

45. **SURVIVAL OF TERMS**
In addition to any numbered section in this Agreement which specifically state that the term or paragraph survives the expiration of termination of this Contract, the following sections if included in this Contract also survive: INDEMNIFICATION; RELATION TO THE COUNTY; OWNERSHIP AND RETURN OF RECORDS; AUDIT; COPYRIGHT; INTELLECTUAL PROPERTY INDENNIFICATION; WARRANTY; CONFIDENTIAL INFORMATION.

46. **HEADINGS**
The section headings in this Contract are inserted only for convenience and are not to be construed as part of this Contract or a limitation on the scope of the particular section to which the heading precedes.

47. **AMBIGUITIES**
Each party and its counsel have participated fully in the review and revision of this Agreement. Any rule of construction to the effect that ambiguities are to be resolved against the drafting party shall not apply in interpreting this Agreement. The language in this Agreement shall be interpreted as to its fair meaning and not strictly for or against any party.
48. **NOTICES**  
Unless otherwise provided herein, all notices and other communications required by this Contract shall be deemed to have been given when made in writing and either (a) delivered in person, (b) delivered by an agent, such as an overnight or similar delivery service, or (c) deposited in the United States mail, postage prepaid, certified or registered, addressed as follows:

**TO THE CONTRACTOR:**

Joe Araujo  
Arthur Construction Co., Inc  
23691 Overland Drive  
Dulles, VA 20166

**TO THE COUNTY:**

The County Project Officer (refer to section headed Project Officer) under the Contract Terms and Conditions

AND

Office of the Purchasing Agent  
Arlington County, Virginia  
2100 Clarendon Boulevard, Suite 500  
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 through completion of the Contract, including all warranty and guarantee periods.

WITNESS these signatures:

THE COUNTY BOARD OF ARLINGTON COUNTY, VIRGINIA  
ARTHUR CONSTRUCTION CO., INC

AUTHORIZED SIGNATURE: Maria Meredith  
AUTHORIZED SIGNATURE: [Signature]

NAME AND TITLE: Maria Meredith  
NAME AND TITLE: Joe Araujo

DATE: 4/3/15  
DATE: April 24, 2015
**ITB 562-14 - ATTACHMENT A - BID FORM (PRICING SHEET)**

**CAPITAL IMPROVEMENT PROJECT WORK CATEGORY - BASE BID WORK, AND RESTRICTED HOURS WORK**

Capital Improvement Project Work shall consist generally of larger scale public works infrastructure and street improvement projects including construction, reconstruction, and maintenance of: State and County streets, curbs & gutters, sidewalks, walkways, driveway aprons, storm sewer pipes and inlets, pavement markings and signage, electrical conduits, traffic controls, streetscapes and related site work.

**PLEASE PROVIDE PRICES IN ALL CELLS HIGHLIGHTED IN BLUE FOR BOTH BASE BID WORK, AND RESTRICTED HOURS WORK.**

All Unit Prices on the Bid Form shall reflect and be inclusive of all costs, including but not limited to: tasks, labor, supplies, tools, equipment, transportation, mobilization, clearing and grubbing, demolition, saw-cutting, material provisions and installations, disposals, incidentals, and all things necessary to perform the work as set forth in accordance with project plans and specifications and in compliance with all Arlington County and VDOT Standards and Specifications.

<table>
<thead>
<tr>
<th>LINE ITEM NUMBER</th>
<th>LINE ITEM DESCRIPTION (All Items per Arlington County Standards &amp; Specs, unless otherwise noted. Absent Arlington County Standards &amp; Specs, use VDOT Standards &amp; Specs, unless otherwise noted.)</th>
<th>UNIT PRICE ($)</th>
<th>TOTAL ESTIMATED ANNUAL QUANTITY (TEQ)</th>
<th>TOTAL ESTIMATED PRICE</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1. 1</td>
<td>General Excavation, only when not included in other pay items</td>
<td>$25.00</td>
<td>CY 11,000</td>
<td>$275,000</td>
</tr>
<tr>
<td>C1. 2</td>
<td>Rock Excavation, only when not included in other pay items</td>
<td>$75.00</td>
<td>CY 100</td>
<td>$7,500</td>
</tr>
<tr>
<td>C1. 3</td>
<td>Test Pits (or Test Bores), Up to 6' Deep (with restoration)</td>
<td>$3,000.00</td>
<td>EA 20</td>
<td>$60,000</td>
</tr>
<tr>
<td>C1. 4</td>
<td>Test Pits (or Test Bores), Each VF Over 6' Deep (with restoration)</td>
<td>$585.00</td>
<td>VF 20</td>
<td>$11,700</td>
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<tr>
<td>C1. 5</td>
<td>Select Borrow (VDOT Section 207 – Select Material, Type 1)</td>
<td>$40.00</td>
<td>CY 100</td>
<td>$4,000</td>
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<tr>
<td>C1. 6</td>
<td>Flowable Backfill (VDOT Special Provision S302G02-0610)</td>
<td>$100.00</td>
<td>CY 10</td>
<td>$1,000</td>
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<tr>
<td>C1. 7</td>
<td>Geotextile Drainage Fabric In Place (VDOT Section 245.03.c)</td>
<td>$2.00</td>
<td>SY 2,000</td>
<td>$4,000</td>
</tr>
<tr>
<td>C1. 8</td>
<td>Geotextile for Rip Rap Bedding In Place (VDOT Section 245.03.b)</td>
<td>$3.00</td>
<td>SY 100</td>
<td>$3,000</td>
</tr>
<tr>
<td>C1. 9</td>
<td>Aggregate, Cement Treated (CTA), also known as &quot;Hydraulic Cement Stabilization&quot; (VDOT Section 307)</td>
<td>$90.00</td>
<td>CY 10</td>
<td>$900</td>
</tr>
<tr>
<td>C1. 10</td>
<td>Aggregate, VDOT #2</td>
<td>$40.00</td>
<td>TON 10</td>
<td>$4,000</td>
</tr>
<tr>
<td>C1. 11</td>
<td>Aggregate, VDOT #21-A</td>
<td>$27.00</td>
<td>TON 5,000</td>
<td>$135,000</td>
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<tr>
<td>C1. 12</td>
<td>Aggregate, VDOT #21-B</td>
<td>$27.00</td>
<td>TON 200</td>
<td>$54,000</td>
</tr>
<tr>
<td>C1. 13</td>
<td>Aggregate, Crusher Run VDOT #25 or approved equal</td>
<td>$27.00</td>
<td>TON 10</td>
<td>$2,700</td>
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<tr>
<td>C1. 14</td>
<td>Aggregate, VDOT #57</td>
<td>$35.00</td>
<td>TON 550</td>
<td>$19,250</td>
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<tr>
<td>C1. 15</td>
<td>Riprap, Dry Class I</td>
<td>$180.00</td>
<td>SY 10</td>
<td>$1,800</td>
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<tr>
<td>C1. 16</td>
<td>Riprap, Dry Class II</td>
<td>$200.00</td>
<td>SY 5</td>
<td>$1,000</td>
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<tr>
<td>C1. 17</td>
<td>Riprap, Mortared</td>
<td>$36.00</td>
<td>SY 10</td>
<td>$360</td>
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<tr>
<td>C1. 18</td>
<td>Riprap, Grouted</td>
<td>$36.00</td>
<td>SY 10</td>
<td>$360</td>
</tr>
<tr>
<td>C1. 19</td>
<td>Riprap, Dumped Type (1) Core Riprap</td>
<td>$50.00</td>
<td>TON 10</td>
<td>$500</td>
</tr>
<tr>
<td>C1. 20</td>
<td>Riprap, Dumped Type (2) Heavy Riprap</td>
<td>$65.00</td>
<td>TON 5</td>
<td>$325</td>
</tr>
</tbody>
</table>

**EXHIBIT D TO ARLINGTON COUNTY CONTRACT 562-14**

**BIDDER NAME:** ARTHUR CONSTRUCTION
<table>
<thead>
<tr>
<th>C2.</th>
<th>Description</th>
<th>Unit</th>
<th>Quantity</th>
<th>Price 1</th>
<th>Price 2</th>
<th>Method</th>
<th>Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.</td>
<td>Rigid Concrete, Planing or Milling</td>
<td></td>
<td></td>
<td>$10.00</td>
<td>$10.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Concrete Curb, Standard Header Curb C-3 (Detail R-2.0), includes curb for aprons, ramps, etc.</td>
<td></td>
<td></td>
<td>$22.00</td>
<td>$22.00</td>
<td>LF</td>
<td>2,500</td>
</tr>
<tr>
<td>4.</td>
<td>Concrete Curb, Mountable Curb at Traffic Circle (Detail R-2.7)</td>
<td></td>
<td></td>
<td>$22.00</td>
<td>$22.00</td>
<td>LF</td>
<td>250</td>
</tr>
<tr>
<td>5.</td>
<td>Concrete Curb, Standard 6&quot; (VDOT CG-2), includes curb for aprons, ramps, etc.</td>
<td></td>
<td></td>
<td>$22.00</td>
<td>$22.00</td>
<td>LF</td>
<td>200</td>
</tr>
<tr>
<td>6.</td>
<td>Concrete Curb, Standard 4&quot; (VDOT CG-3), includes curb for aprons, ramps, etc.</td>
<td></td>
<td></td>
<td>$22.00</td>
<td>$22.00</td>
<td>LF</td>
<td>500</td>
</tr>
<tr>
<td>7.</td>
<td>Concrete Curbbiology, Combination 6&quot; (VDOT CG-6), includes curb &amp; gutter for aprons, ramps, etc.</td>
<td></td>
<td></td>
<td>$25.00</td>
<td>$25.00</td>
<td>LF</td>
<td>1,000</td>
</tr>
<tr>
<td>8.</td>
<td>Concrete Curb, Combination 4&quot; (VDOT CG-7), includes curb &amp; gutter for aprons, ramps, etc.</td>
<td></td>
<td></td>
<td>$25.00</td>
<td>$25.00</td>
<td>LF</td>
<td>1,000</td>
</tr>
<tr>
<td>9.</td>
<td>Valley Gutter (Detail R-2.9, including all materials as shown in detail)</td>
<td></td>
<td></td>
<td>$63.00</td>
<td>$63.00</td>
<td>SY</td>
<td>250</td>
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<tr>
<td>10.</td>
<td>Concrete Sidewalk, 4&quot; Thickness (Detail R-2.0)</td>
<td></td>
<td></td>
<td>$45.50</td>
<td>$45.50</td>
<td>SY</td>
<td>5,000</td>
</tr>
<tr>
<td>11.</td>
<td>Concrete Sidewalk, 6&quot; Thickness</td>
<td></td>
<td></td>
<td>$54.00</td>
<td>$54.00</td>
<td>SY</td>
<td>100</td>
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<tr>
<td>12.</td>
<td>Concrete Pavers (Detail R-2.1)</td>
<td></td>
<td></td>
<td>$200.00</td>
<td>$200.00</td>
<td>SY</td>
<td>10</td>
</tr>
<tr>
<td>13.</td>
<td>Concrete Pavers, Remove and Reset (Detail R-2.1)</td>
<td></td>
<td></td>
<td>$150.00</td>
<td>$150.00</td>
<td>SY</td>
<td>50</td>
</tr>
<tr>
<td>14.</td>
<td>Concrete Paver Crosswalk (Detail R-2.6, including all materials as shown in detail)</td>
<td></td>
<td></td>
<td>$250.00</td>
<td>$250.00</td>
<td>SY</td>
<td>10</td>
</tr>
<tr>
<td>15.</td>
<td>Concrete Paver Crosswalk, Remove and Reset (Detail R-2.6, including all materials as shown in detail)</td>
<td></td>
<td></td>
<td>$200.00</td>
<td>$200.00</td>
<td>SY</td>
<td>10</td>
</tr>
<tr>
<td>16.</td>
<td>Concrete Driveway Entrance, 6&quot; Residential (Details R-2.4A, R-2.4B, R-2.4C, R-2.4D)</td>
<td></td>
<td></td>
<td>$58.50</td>
<td>$58.50</td>
<td>SY</td>
<td>1,200</td>
</tr>
<tr>
<td>17.</td>
<td>Concrete Driveway Entrance, 9&quot; Commercial (Details R-2.4A, R-2.4B, R-2.4C, R-2.4D)</td>
<td></td>
<td></td>
<td>$81.00</td>
<td>$81.00</td>
<td>SY</td>
<td>300</td>
</tr>
<tr>
<td>18.</td>
<td>Concrete Curb Ramps, (VDOT CG-12, Type A Application or Modified Type A Application), including truncated dome detectable warning.</td>
<td></td>
<td></td>
<td>$900.00</td>
<td>$900.00</td>
<td>EA</td>
<td>100</td>
</tr>
<tr>
<td>19.</td>
<td>Concrete Curb Ramps, (VDOT CG-12, Type B Application or Modified Type B Application), including truncated dome detectable warning.</td>
<td></td>
<td></td>
<td>$900.00</td>
<td>$900.00</td>
<td>EA</td>
<td>100</td>
</tr>
<tr>
<td>20.</td>
<td>Concrete Curb Ramps, (VDOT CG-12, Type C Application or Modified Type C Application), including truncated dome detectable warning.</td>
<td></td>
<td></td>
<td>$900.00</td>
<td>$900.00</td>
<td>EA</td>
<td>100</td>
</tr>
<tr>
<td>21.</td>
<td>Concrete Steps Each (Detail R-3.0, including all reinforcing bars as shown in detail)</td>
<td></td>
<td></td>
<td>$75.00</td>
<td>$75.00</td>
<td>LF-W</td>
<td>50</td>
</tr>
<tr>
<td>22.</td>
<td>Concrete Pier, Cradle, or Encasement (Detail M-3.0)</td>
<td></td>
<td></td>
<td>$250.00</td>
<td>$250.00</td>
<td>CY</td>
<td>10</td>
</tr>
<tr>
<td>23.</td>
<td>Concrete Pier, Cradle, or Encasement (Detail M-7.0)</td>
<td></td>
<td></td>
<td>$350.00</td>
<td>$350.00</td>
<td>CY</td>
<td>10</td>
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<tr>
<td>24.</td>
<td>Concrete and Formwork (VDOT Class A3), only when not included in other pay Items</td>
<td></td>
<td></td>
<td>$300.00</td>
<td>$300.00</td>
<td>CY</td>
<td>10</td>
</tr>
<tr>
<td>25.</td>
<td>Concrete and Formwork (VDOT Class A4), only when not included in other pay Items</td>
<td></td>
<td></td>
<td>$500.00</td>
<td>$500.00</td>
<td>CY</td>
<td>5</td>
</tr>
<tr>
<td>C2. 26</td>
<td>Steel Reinforcement, Welded Wire Fabric (VDOT Section 406), only when not included in other pay items</td>
<td>$2.00</td>
<td>$2.00</td>
<td>LB</td>
<td>100</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>C2. 27</td>
<td>Steel Reinforcement, Reinforcing Steel Bars #6 and smaller (VDOT Section 406), only when not included in other pay items</td>
<td>$3.00</td>
<td>$3.00</td>
<td>LB</td>
<td>150</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>C2. 28</td>
<td>Steel Reinforcement, Reinforcing Steel Bars #7 up to #10 (VDOT Section 406), only when not included in other pay items</td>
<td>$4.00</td>
<td>$4.00</td>
<td>LB</td>
<td>150</td>
<td>$</td>
<td>$</td>
</tr>
</tbody>
</table>

### C3. ASPHALT WORK

| C3. 1 | Asphalt Concrete, Planing or Milling (1/2” to 3” Depth) | $6.00 | $6.00 | SY | 650 | $ | $ |
| C3. 2 | Asphalt Concrete, Planing or Milling (In Excess of 3” Depth) | $1.00 | $1.00 | SY/IN | 100 | $ | $ |
| C3. 3 | Asphalt Concrete, Base Course (VDOT BM-25.0A) | $80.00 | $80.00 | TON | 3,500 | $ | $ |
| C3. 4 | Asphalt Concrete, Intermediate Course (VDOT IM-19.0A) | $81.00 | $81.00 | TON | 50 | $ | $ |
| C3. 5 | Asphalt Concrete, Surface Course (VDOT SM-9.5A) | $82.00 | $82.00 | TON | 700 | $ | $ |
| C3. 6 | Asphalt Concrete, Stamped - Imprinting Hot Mix Asphalt Concrete (per Supplemental Specification 02600) | $5.00 | $5.00 | SF | 500 | $ | $ |
| C3. 7 | Asphalt Concrete, Stamped - Heating Asphalt (per Supplemental Specification 02600) | $8.00 | $8.00 | SF | 500 | $ | $ |
| C3. 8 | Asphalt Concrete, Stamped - Provide and Install Streetbond Coating (per Supplemental Specification 02601) | $5.50 | $5.50 | SF | 2,000 | $ | $ |
| C3. 9 | Asphalt Concrete, Stamped - Imprinted Asphalt Patching (per Supplemental Specification 02600) | $27.75 | $27.75 | SF | 200 | $ | $ |
| C3. 10 | Asphalt Header Curb, 6”-8” (VDOT SM-9.5A) | $25.00 | $25.00 | LF | 50 | $ | $ |
| C3. 11 | Cold-Mix Asphalt (latest VDOT Standards for Cold Mix Asphalt Type P-1, P-2, and P-3) | $150.00 | $150.00 | TON | 10 | $ | $ |

### C4. STORM SEWER UTILITY WORK

| C4. 1 | Storm Manhole MH-1 (Detail D-3.0), In Place | $400.00 | $400.00 | VF | 100 | $ | $ |
| C4. 2 | Storm Manhole Pre-Cast PH-1 (Detail D-3.1), In Place | $350.00 | $350.00 | VF | 10 | $ | $ |
| C4. 3 | Storm Manhole MH-2 (Detail D-3.3), In Place | $400.00 | $400.00 | VF | 10 | $ | $ |
| C4. 4 | Storm Manhole MH-3 (Detail D-3.4), In Place | $400.00 | $400.00 | VF | 10 | $ | $ |
| C4. 5 | Storm Manhole MH-4 (Detail D-3.5), In Place | $400.00 | $400.00 | VF | 10 | $ | $ |
| C4. 6 | Storm Manhole (VDOT MH-1, MH1-A), In Place | $400.00 | $400.00 | VF | 10 | $ | $ |
| C4. 7 | Storm Manhole (VDOT MH-2), In Place | $400.00 | $400.00 | VF | 10 | $ | $ |
| C4. 8 | Catch Basin Standard CB-2, In Place Up to 6’ Deep | $4,250.00 | $4,250.00 | EA | 30 | $ | $ |
| C4. 9 | Catch Basin Standard CB-2, Each VF Over 6’ Deep | $300.00 | $300.00 | VA | 10 | $ | $ |
| C4. 10 | Catch Basin with Extended Throats CB-2A or CB-2B (throat lengths from 8’-5” up to 16’-9”), In Place Up to 6’ Deep | $5,800.00 | $5,800.00 | EA | 40 | $ | $ |
| C4. 11 | Catch Basin with Extended Throats CB-2A or CB-2B (throat lengths from 8’-6” up to 16’-9”), Each VF Over 6’ Deep | $300.00 | $300.00 | VF | 15 | $ | $ |
| C4. 12 | Catch Basin Pre-Cast PCB-2, In Place Up to 6’ Deep | $6,000.00 | $6,000.00 | EA | 5 | $ | $ |
| C4. 13 | Catch Basin Pre-Cast PCB-2, Each VF Over 6’ Deep | $300.00 | $300.00 | VA | 5 | $ | $ |
| C4. 14 | Catch Basin with Double Throat CB-4, In Place Up to 6’ Deep | $7,000.00 | $7,000.00 | EA | 5 | $ | $ |
| C4. 15 | Catch Basin with Double Throat CB-4, Each VF Over 6’ Deep | $425.00 | $425.00 | VF | 5 | $ | $ |

**BIDDER NAME:** **Arthur Construction**
<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th>Unit Cost</th>
<th>Unit Qty</th>
<th>Unit Price</th>
<th>Total Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>C4. 16</td>
<td>Curb Drop Inlet, Standard VDOT DI-1 (12&quot; to 24&quot; Pipe), In Place Up to 10' Deep</td>
<td>$5,000.00</td>
<td>EA 5</td>
<td>$10,000.00</td>
<td></td>
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<tr>
<td>C4. 17</td>
<td>Curb Drop Inlet, Standard VDOT DI-2A (12&quot; to 24&quot; Pipe), In Place Up to 9' Deep</td>
<td>$5,500.00</td>
<td>EA 5</td>
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<td>C4. 18</td>
<td>Curb Drop Inlet, Standard VDOT DI-2B (12&quot; to 24&quot; Pipe), In Place Up to 9' Deep, Inlet Throat Length 4' to 20'</td>
<td>$7,900.00</td>
<td>EA 5</td>
<td>$39,500.00</td>
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<td>C4. 19</td>
<td>Curb Drop Inlet, Standard VDOT DI-2C (12&quot; to 24&quot; Pipe), In Place Up to 9' Deep, Inlet Throat Length 6' to 20'</td>
<td>$7,900.00</td>
<td>EA 5</td>
<td>$39,500.00</td>
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<td>C4. 20</td>
<td>Curb Drop Inlet, Standard VDOT DI-2D (30&quot; to 48&quot; Pipe), In Place Up to 9' Deep</td>
<td>$8,600.00</td>
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<td>C4. 21</td>
<td>Curb Drop Inlet, Standard VDOT DI-3E (30&quot; to 48&quot; Pipe), In Place Up to 9' Deep, Inlet Throat Length 6' to 20'</td>
<td>$11,000.00</td>
<td>EA 5</td>
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<td>C4. 22</td>
<td>Curb Drop Inlet, Standard VDOT DI-3F (30&quot; to 48&quot; Pipe), In Place Up to 9' Deep, Inlet Throat Length 6' to 20'</td>
<td>$11,000.00</td>
<td>EA 5</td>
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<td>C4. 23</td>
<td>Curb Drop Inlet, Standard VDOT DI-3A (12&quot; to 30&quot; Pipe), In Place Up to 8' Deep</td>
<td>$5,700.00</td>
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<td>C4. 24</td>
<td>Curb Drop Inlet, Standard VDOT DI-3AA (12&quot; to 30&quot; Pipe), Each VF Over 8' Deep</td>
<td>$350.00</td>
<td>VF 5</td>
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<td>C4. 25</td>
<td>Curb Drop Inlet, Standard VDOT DI-3B (12&quot; to 30&quot; Pipe), In Place Up to 8' Deep, Inlet Throat Length 4' to 20'</td>
<td>$8,000.00</td>
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<td>C4. 26</td>
<td>Curb Drop Inlet, Standard VDOT DI-3BB (12&quot; to 30&quot; Pipe), Each VF Over 8' Deep, Inlet Throat Length 4' to 20'</td>
<td>$350.00</td>
<td>VF 5</td>
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<td>C4. 27</td>
<td>Curb Drop Inlet, Standard VDOT DI-3C (12&quot; to 30&quot; Pipe), In Place Up to 8' Deep, Inlet Throat Length 6' to 20'</td>
<td>$8,000.00</td>
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<td>C4. 28</td>
<td>Curb Drop Inlet, Standard VDOT DI-3CC (12&quot; to 30&quot; Pipe), Each VF Over 8' Deep, Inlet Throat Length 6' to 20'</td>
<td>$350.00</td>
<td>VF 5</td>
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<tr>
<td>C4. 29</td>
<td>Curb Drop Inlet, Standard (with Utility Space) VDOT DI-3D (12&quot; to 30&quot; Pipe), In Place Up to 8' Deep</td>
<td>$6,500.00</td>
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<td>C4. 30</td>
<td>Curb Drop Inlet, Standard (with Utility Space) VDOT DI-3E (12&quot; to 30&quot; Pipe), In Place Up to 8' Deep, Inlet Throat Length 4' to 20'</td>
<td>$8,750.00</td>
<td>EA 5</td>
<td>$43,750.00</td>
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<tr>
<td>C4. 31</td>
<td>Curb Drop Inlet, Standard (with Utility Space) VDOT DI-3F (12&quot; to 30&quot; Pipe), In Place Up to 8' Deep, Inlet Throat Length 6' to 20'</td>
<td>$8,750.00</td>
<td>EA 5</td>
<td>$43,750.00</td>
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<td>C4. 32</td>
<td>Curb Drop Inlet, Standard VDOT DI-4A (36&quot; to 48&quot; Pipe), In Place Up to 8' Deep</td>
<td>$6,750.00</td>
<td>EA 5</td>
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<tr>
<td>C4. 33</td>
<td>Curb Drop Inlet, Standard VDOT DI-4B (36&quot; to 48&quot; Pipe), In Place Up to 8' Deep, Inlet Throat Length 6' to 20'</td>
<td>$9,000.00</td>
<td>EA 5</td>
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<tr>
<td>C4. 34</td>
<td>Curb Drop Inlet, Standard VDOT DI-4C (36&quot; to 48&quot; Pipe), In Place Up to 8' Deep, Inlet Throat Length 8' to 20'</td>
<td>$9,000.00</td>
<td>EA 5</td>
<td>$45,000.00</td>
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<td>C4. 35</td>
<td>Curb Drop Inlet, Standard (with Utility Space) VDOT DI-4D (36&quot; to 48&quot; Pipe), In Place Up to 8' Deep</td>
<td>$9,500.00</td>
<td>EA 5</td>
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<td>C4. 36</td>
<td>Curb Drop Inlet, Standard (with Utility Space) VDOT DI-4E (36&quot; to 48&quot; Pipe), In Place Up to 8' Deep, Inlet Throat Length 6' to 20'</td>
<td>$12,000.00</td>
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<td>C4. 37</td>
<td>Curb Drop Inlet, Standard (with Utility Space) VDOT DI-4F (36&quot; to 48&quot; Pipe), In Place Up to 8' Deep, Inlet Throat Length 8' to 20'</td>
<td>$12,000.00</td>
<td>EA 5</td>
<td>$60,000.00</td>
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<td>C4. 38</td>
<td>Yard Inlet (Detail D-1.10), In Place Up to 8' Deep</td>
<td>$5,000.00</td>
<td>EA 5</td>
<td>$25,000.00</td>
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**BIDDER NAME:** ARTHUR CONSTRUCTION
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<td>Yard Inlet (Detail D-1.10), Each VF Over 6’ Deep</td>
<td>$250.00</td>
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<td>$1,250.00</td>
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<td>C4. 40</td>
<td>Yard Inlet Pre-Cast (Detail D-1.11), In Place Up to 6’ Deep</td>
<td>$4,000.00</td>
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<td>C4. 41</td>
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<td>C4. 42</td>
<td>Grate Inlet Non-roadway Shallow (Detail D-1.9), In Place Up to 6’ Deep</td>
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<td>C4. 43</td>
<td>Grate Inlet Non-roadway Shallow (Detail D-1.9), Each VF Over 6’ Deep</td>
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<td>C4. 44</td>
<td>Grate Inlet Driveway (Detail D-1.12)</td>
<td>$300.00</td>
<td>LF 5</td>
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<td>C4. 45</td>
<td>Storm Manhole Frame and Cover, Remove &amp; Replace</td>
<td>$750.00</td>
<td>EA 5</td>
<td>$3,750.00</td>
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<tr>
<td>C4. 46</td>
<td>Catch Basin Structure Top, Remove &amp; Replace</td>
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<td>EA 5</td>
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<td>C4. 47</td>
<td>Drop Inlet Structure Top, Remove &amp; Replace</td>
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<td>C4. 48</td>
<td>Adjust Storm Manhole to New Grade (Detail S-2.5), Type A</td>
<td>$400.00</td>
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<td>C4. 49</td>
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<td>$700.00</td>
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<td>C4. 51</td>
<td>Convert Catch Basin to Manhole</td>
<td>$750.00</td>
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<td>C4. 52</td>
<td>Convert Grate Inlet to Catch Basin</td>
<td>$750.00</td>
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<tr>
<td>C4. 53</td>
<td>Partial Wall Repair of Storm Manhole, Catch Basin, Drop Inlet, Yard Inlet</td>
<td>$25.00</td>
<td>SF 100</td>
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<tr>
<td>C4. 54</td>
<td>Core Drill and Connect New Concrete Pipe to Existing Storm Manhole, Catch Basin, Drop Inlet, Yard Inlet, or Grate Inlet</td>
<td>$500.00</td>
<td>EA 10</td>
<td>$5,000.00</td>
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<tr>
<td>C4. 55</td>
<td>Core Drill and Connect PVC Pipe (up to 6” diameter) to Existing Storm Manhole, Catch Basin, Drop Inlet, Yard Inlet, or Grate Inlet</td>
<td>$500.00</td>
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<td>C4. 56</td>
<td>Storm Manhole, Catch Basin, Drop Inlet, Yard Inlet, or Grate Inlet, Remove</td>
<td>$1,000.00</td>
<td>EA 10</td>
<td>$10,000.00</td>
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<tr>
<td>C4. 57</td>
<td>Storm Manhole, Catch Basin, Drop Inlet, Yard Inlet, or Grate Inlet, Abandon</td>
<td>$1,000.00</td>
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<td>$10,000.00</td>
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<td>C4. 58</td>
<td>15” Pipe, RCP Class III, In Place Up to 6’ Deep</td>
<td>$80.00</td>
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<td>$40,000.00</td>
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<tr>
<td>C4. 59</td>
<td>15” Pipe, RCP Class III, In Place 6’ to 10’ Deep</td>
<td>$100.00</td>
<td>LF 100</td>
<td>$10,000.00</td>
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<td>C4. 60</td>
<td>18” Pipe, RCP Class III, In Place Up to 6’ Deep</td>
<td>$90.00</td>
<td>LF 300</td>
<td>$27,000.00</td>
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<td>C4. 61</td>
<td>18” Pipe, RCP Class III, In Place 6’ to 10’ Deep</td>
<td>$105.00</td>
<td>LF 50</td>
<td>$5,250.00</td>
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<td>C4. 62</td>
<td>21” Pipe, RCP Class III, In Place Up to 6’ Deep</td>
<td>$95.00</td>
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<td>21” Pipe, RCP Class III, In Place 6’ to 10’ Deep</td>
<td>$110.00</td>
<td>LF 50</td>
<td>$5,500.00</td>
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<td>C4. 64</td>
<td>24” Pipe, RCP Class III, In Place Up to 6’ Deep</td>
<td>$100.00</td>
<td>LF 100</td>
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<td>24” Pipe, RCP Class III, In Place 6’ to 10’ Deep</td>
<td>$115.00</td>
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<td>C4. 66</td>
<td>27” Pipe, RCP Class III, In Place Up to 6’ Deep</td>
<td>$115.00</td>
<td>LF 100</td>
<td>$11,500.00</td>
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<td>C4. 67</td>
<td>27” Pipe, RCP Class III, In Place 6’ to 10’ Deep</td>
<td>$130.00</td>
<td>LF 25</td>
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<td>C4. 68</td>
<td>30” Pipe, RCP Class III, In Place Up to 6’ Deep</td>
<td>$130.00</td>
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<td>30” Pipe, RCP Class III, In Place 6’ to 10’ Deep</td>
<td>$145.00</td>
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<td>C4. 70</td>
<td>33” Pipe, RCP Class III, In Place Up to 6’ Deep</td>
<td>$150.00</td>
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**BIDDER NAME:** ARTHUR CONSTRUCTION
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BIDDER NAME: **ARTHUR CONSTRUCTION**
### ITB 562-14 - ATTACHMENT A - BID FORM (PRICING SHEET)

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### CS. MISCELLANEOUS WET AND DRY UTILITY WORK

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<td>PVC Sanitary Sewer Service (4&quot;, 6&quot;, or 8&quot;)</td>
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<tr>
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<td>PVC Pipe (4&quot;, 6&quot;, or 8&quot;), SDR 35 (less than 14' of cover), only when not included in other pay items</td>
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<td>5</td>
<td>PVC Pipe (4&quot;, 6&quot;, or 8&quot;), SDR 26 or stronger (14' to 20' of cover), only when not included in other pay items</td>
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<td>Water Meter Frame &amp; Cover, Replace</td>
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<tr>
<td>9</td>
<td>Water Meter Relocation (Install Copper Tubing, Connect to Existing County and Private Service Lines, Provide New Angle Valves, Relocate Meter Housing and Meter Yoke, Excavation and Backfill)</td>
<td>$3,000.00</td>
<td>$3,000.00</td>
<td>10</td>
<td>$</td>
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BIDDER NAME: AMHERST CONSTRUCTION
### ITB 562-14 - ATTACHMENT A - BID FORM (PRICING SHEET)

<table>
<thead>
<tr>
<th>CS.</th>
<th>Description</th>
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<th>Rate</th>
<th>Quantity</th>
<th>Subtotal</th>
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<tr>
<td>10</td>
<td>Non-Freeze Boxed Ground Hydrant (with Locking Cover and Keys), Jay R. Smith or County approved equivalent.</td>
<td>$3,500.00</td>
<td>$3,500.00</td>
<td>EA</td>
<td>5</td>
<td>$________</td>
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<tr>
<td>11</td>
<td>Fire Hydrant</td>
<td>$8,500.00</td>
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<td>12</td>
<td>Fire Hydrant (Any Type), Remove and Dispose</td>
<td>$1,500.00</td>
<td>$1,500.00</td>
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<td>5</td>
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<tr>
<td>13</td>
<td>Sanitary Sewer Manhole, Remove or Abandon (County Section 02300, VDOT Section S20)</td>
<td>$300.00</td>
<td>$300.00</td>
<td>LF</td>
<td>10</td>
<td>$________</td>
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<tr>
<td>14</td>
<td>Adjust Sanitary Manhole to New Grade (Detail S-25), Type A</td>
<td>$400.00</td>
<td>$400.00</td>
<td>EA</td>
<td>10</td>
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<td>15</td>
<td>Adjust Sanitary Manhole to New Grade (Detail S-25), Type B</td>
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<td>16</td>
<td>Adjust Sanitary Manhole to New Grade (Detail S-25), Type C</td>
<td>$400.00</td>
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<td>EA</td>
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<td>17</td>
<td>Gas Valve Box Vertical Adjustment to New Grade</td>
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<tr>
<td>18</td>
<td>Traffic Box Vertical Adjustment to New Grade</td>
<td>$1,250.00</td>
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<td>10</td>
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<td>19</td>
<td>Electrical Box Vertical Adjustment to New Grade</td>
<td>$1,250.00</td>
<td>$1,250.00</td>
<td>EA</td>
<td>30</td>
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<tr>
<td>20</td>
<td>Electrical Conduit (Detail TS4-7)</td>
<td>$30.00</td>
<td>$30.00</td>
<td>LF</td>
<td>2,000</td>
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<td>21</td>
<td>Fiber Optic Conduit (Detail TS6-7)</td>
<td>$30.00</td>
<td>$30.00</td>
<td>LF</td>
<td>1,000</td>
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<td>$________</td>
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<td>22</td>
<td>Poly Pipe for Boring, Schedule 40 (and aluminum threaded or &quot;E-LOC&quot; couplings), only when not included in other pay items</td>
<td>$70.00</td>
<td>$70.00</td>
<td>LF</td>
<td>2,000</td>
<td>$________</td>
<td>$________</td>
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<tr>
<td>23</td>
<td>Junction Box (or Pull Box), Small (Detail LT-16 or TS4-4)</td>
<td>$1,500.00</td>
<td>$1,500.00</td>
<td>EA</td>
<td>5</td>
<td>$________</td>
<td>$________</td>
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<tr>
<td>24</td>
<td>Junction Box (or Pull Box), Large (Detail LT-17)</td>
<td>$1,750.00</td>
<td>$1,750.00</td>
<td>EA</td>
<td>5</td>
<td>$________</td>
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<tr>
<td>25</td>
<td>Junction Box (or Pull Box), Large (Detail TS4-5.1)</td>
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<tr>
<td>26</td>
<td>Junction Box (or Pull Box), Electrical for Non-Deliberate Traffic Use (Detail TS4-6)</td>
<td>$1,750.00</td>
<td>$1,750.00</td>
<td>EA</td>
<td>5</td>
<td>$________</td>
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<tr>
<td>27</td>
<td>Junction Box (or Pull Box), Any Size or Material, Remove or Abandon</td>
<td>$1,400.00</td>
<td>$1,400.00</td>
<td>EA</td>
<td>5</td>
<td>$________</td>
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### C6. PAVEMENT MARKING AND SIGNAGE WORK

#### GROUP 2 PAVEMENT MARKINGS (VDOT TYPE B, CLASS I, II, III, & VI - THERMO/EPoxy)

<table>
<thead>
<tr>
<th>C6.</th>
<th>Description</th>
<th>Price 1</th>
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<th>Unit</th>
<th>Rate</th>
<th>Quantity</th>
<th>Subtotal</th>
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<tr>
<td>1</td>
<td>Four (4) Inch Transverse Markings</td>
<td>$1.45</td>
<td>$1.45</td>
<td>LF</td>
<td>100</td>
<td>$________</td>
<td>$________</td>
</tr>
<tr>
<td>2</td>
<td>Four (6) Inch Transverse Markings</td>
<td>$1.45</td>
<td>$1.45</td>
<td>LF</td>
<td>50</td>
<td>$________</td>
<td>$________</td>
</tr>
<tr>
<td>3</td>
<td>Eighteen (18) Inch Transverse Markings</td>
<td>$6.50</td>
<td>$6.50</td>
<td>LF</td>
<td>500</td>
<td>$________</td>
<td>$________</td>
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<tr>
<td>4</td>
<td>Twenty Four (24) Inch Transverse Markings, Note: Used For Continental (Ladder) Crosswalk</td>
<td>$9.20</td>
<td>$9.20</td>
<td>LF</td>
<td>500</td>
<td>$________</td>
<td>$________</td>
</tr>
<tr>
<td>5</td>
<td>Yield Line Markings (Twenty Four (24) Inch Triangle/Twelve (12) Inch Spacing), Note: LF is Width of Lane for Units</td>
<td>$23.00</td>
<td>$23.00</td>
<td>LF</td>
<td>100</td>
<td>$________</td>
<td>$________</td>
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<tr>
<td>6</td>
<td>Four (4) Inch Longitudinal Solid Line</td>
<td>$1.45</td>
<td>$1.45</td>
<td>LF</td>
<td>10,000</td>
<td>$________</td>
<td>$________</td>
</tr>
<tr>
<td>7</td>
<td>Four (4) Inch Longitudinal Skip Line (Ten (10) Foot Line/Thirty (30) Foot Spacing), Note: Forty (40) LF Consists of Ten (10) LF of Marking and Thirty (30) LF of Space</td>
<td>$1.45</td>
<td>$1.45</td>
<td>LF</td>
<td>500</td>
<td>$________</td>
<td>$________</td>
</tr>
<tr>
<td>8</td>
<td>Four (4) Inch Longitudinal Skip Line (Ten (10) Foot Line/Twenty (20) Foot Spacing), Note: Thirty (30) LF Consists of Ten (10) LF of Marking and Twenty (20) LF of Space</td>
<td>$1.45</td>
<td>$1.45</td>
<td>LF</td>
<td>500</td>
<td>$________</td>
<td>$________</td>
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**BIDDER NAME:** ARTHUR CONSTRUCTION
<table>
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<th>Item Description</th>
<th>Quantity</th>
<th>Unit</th>
<th>Price per Unit</th>
<th>Total Price</th>
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<tbody>
<tr>
<td></td>
<td>Four (4) Inch Longitudinal Skip Line (Two (2) Foot Line/Ten (10) Foot Spacing),</td>
<td>$1.45</td>
<td>LF</td>
<td>$1.45</td>
<td>$250</td>
</tr>
<tr>
<td></td>
<td>Note: Twelve (12) LF Consists of Two (2) LF of Marking and Ten (10) LF of Space, <strong>Turn Lane Skips</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>C6.</td>
<td>Four (4) Inch Longitudinal Skip Line (Three (3) Foot Line/Nine (9) Foot Spacing),</td>
<td>$1.15</td>
<td>LF</td>
<td>$1.15</td>
<td>$100</td>
</tr>
<tr>
<td></td>
<td>Note: 12 LF Consists of 3 LF of Marking and 9 LF of Space, <strong>Centerline For Bike Trail Only</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>C6.</td>
<td>Six (6) Inch Longitudinal Solid Line</td>
<td>$2.20</td>
<td>LF</td>
<td>$2.20</td>
<td>$100</td>
</tr>
<tr>
<td>C6.</td>
<td>Six (6) Inch Longitudinal Skip Line (Ten (10) Foot Line/Thirty (30) Foot Spacing),</td>
<td>$2.20</td>
<td>LF</td>
<td>$2.20</td>
<td>$50</td>
</tr>
<tr>
<td></td>
<td>Note: Forty (40) LF Consists of Ten (10) LF of Marking and Thirty (30) LF of Space</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C6.</td>
<td>Six (6) Inch Longitudinal Skip Line (Ten (10) Foot Line/Twenty (20) Foot Spacing),</td>
<td>$2.20</td>
<td>LF</td>
<td>$2.20</td>
<td>$50</td>
</tr>
<tr>
<td></td>
<td>Note: Thirty (30) LF Consists of Ten (10) LF of Marking and Twenty (20) LF of Space</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C6.</td>
<td>Twelve (12) Inch Yellow Longitudinal Centerline, Two - Four (4) Inch Yellow Lines with Four (4) Inch Separation</td>
<td>$3.20</td>
<td>LF</td>
<td>$3.20</td>
<td>$2,500</td>
</tr>
<tr>
<td>C6.</td>
<td>Twelve (12) Inch Yellow Two-Way Left Turn Lane Marking, (One-Four (4) Inch Solid Yellow Skip Line (10/30) with Four (4) Inch Spacing), Note: Forty (40) LF Consists of Ten (10) LF of Marking and Thirty (30) LF of Space Next To Forty (40) LF of Marking</td>
<td>$3.20</td>
<td>LF</td>
<td>$3.20</td>
<td>$100</td>
</tr>
<tr>
<td>C6.</td>
<td>Twelve (12) Inch Yellow Longitudinal Reversible Lane Marking, Two - Four (4) Inch Yellow Lines (10/30) with Four (4) Inch Spacing</td>
<td>$3.20</td>
<td>LF</td>
<td>$3.20</td>
<td>$100</td>
</tr>
<tr>
<td>C6.</td>
<td>Longitudinal Wide Double Skip Line, Two - Ten (10) Foot Lines/Thirty (30) Foot Spacing, Note: Forty (40) LF Consists of Ten (10) LF of Marking and Thirty (30) LF of Space</td>
<td>$3.20</td>
<td>LF</td>
<td>$3.20</td>
<td>$50</td>
</tr>
<tr>
<td>C6.</td>
<td>Longitudinal Wide Double Skip Line, Two - Ten (10) Foot Lines/Twenty (20) Foot Spacing, Note: Thirty (30) LF Consists of Ten (10) LF of Marking and Twenty (20) LF of Space</td>
<td>$3.20</td>
<td>LF</td>
<td>$3.20</td>
<td>$50</td>
</tr>
<tr>
<td>C6.</td>
<td>Longitudinal Wide Double Skip Line, Two - Two (2) Foot Lines/Ten (10) Foot Spacing, Note: Twelve (12) LF Consists of Two (2) LF of Marking and Ten (10) LF of Space</td>
<td>$3.20</td>
<td>LF</td>
<td>$3.20</td>
<td>$50</td>
</tr>
<tr>
<td>C6.</td>
<td>Eight (8) Foot Letters, Note: 'Turn Only' (for example)</td>
<td>$1,300.00</td>
<td>EA</td>
<td>$1,300.00</td>
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</tr>
<tr>
<td>C6.</td>
<td>Single Arrows</td>
<td>$150.00</td>
<td>EA</td>
<td>$150.00</td>
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<tr>
<td>C6.</td>
<td>Combination Arrows</td>
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<tr>
<td>C6.</td>
<td>Lane Reduction Arrows</td>
<td>$975.00</td>
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<tr>
<td>C6.</td>
<td>Thirteen (13) Foot Yield Ahead Symbol</td>
<td>$650.00</td>
<td>EA</td>
<td>$650.00</td>
<td></td>
</tr>
<tr>
<td>C6.</td>
<td>Speed Hump Markings (MUTCD Fig. 3B-29 Option A, or Fig. 3B-30 Option B), Two (2) Each Per Hump, <strong>Each Hump Will Have 2 - 1 In Each Direction</strong></td>
<td>$525.00</td>
<td>EA</td>
<td>$525.00</td>
<td></td>
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<tr>
<td>C6.</td>
<td>Standard Bicycle Symbols (MUTCD, Chapter 9C, Figure 9C-3), &quot;Bike Symbol&quot;</td>
<td>$275.00</td>
<td>EA</td>
<td>$275.00</td>
<td></td>
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<tr>
<td>C6.</td>
<td>Standard Bicycle Symbols (MUTCD, Chapter 9C, Figure 9C-9), &quot;Shared Lane Marking&quot;</td>
<td>$275.00</td>
<td>EA</td>
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<tr>
<td>C6.</td>
<td>29</td>
<td>Standard Bicycle Symbols  (MUTCD, Chapter 9C, Figure 9C-7), &quot;Bike Detector Symbol&quot;</td>
<td>$300.00</td>
<td>$300.00</td>
<td>EA</td>
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### ITB 562-14 - ATTACHMENT A - BID FORM (PRICING SHEET)

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<th>Item</th>
<th>Description</th>
<th>Rate (EA)</th>
<th>Unit</th>
<th>EA/PCS</th>
<th>Rate (EA)</th>
<th>Unit</th>
<th>EA/PCS</th>
</tr>
</thead>
<tbody>
<tr>
<td>C6. 30</td>
<td>Six (6) Foot Bicycle Lane Arrow (Only for Multi-Use or Bikes Opposing Traffic)</td>
<td>$300.00</td>
<td>$300.00</td>
<td>EA</td>
<td>5</td>
<td>$</td>
<td>$</td>
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<tr>
<td>C6. 31</td>
<td>Preferential Lane Symbol</td>
<td>$300.00</td>
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<td>$</td>
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<tr>
<td>C6. 32</td>
<td>Handicap Symbol (Off-Street)</td>
<td>$300.00</td>
<td>$300.00</td>
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<td>$</td>
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<tr>
<td>C6. 33</td>
<td>Colorized Bike Lane Coatings (per Supplemental Specification 02901)</td>
<td>$27.50</td>
<td>$27.50</td>
<td>SY</td>
<td>500</td>
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**GROUP 4 PAVEMENT MARKINGS (MARKING REMOVAL)**

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<th>Rate (EA)</th>
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<th>EA/PCS</th>
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<tr>
<td>C6. 34</td>
<td>Removal of Existing Longitudinal Lines (Up To and Including Six (6) Inch Width), Note: Base Unit For Removal</td>
<td>$1.75</td>
<td>$1.75</td>
<td>LF</td>
<td>100</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>C6. 35</td>
<td>Removal of Existing Longitudinal Lines (Each Additional Six (6) Inch Increment), Note: Add to Base Unit for Lines Wider Than Six (6) Inches</td>
<td>$1.75</td>
<td>$1.75</td>
<td>LF</td>
<td>100</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>C6. 36</td>
<td>Removal of Existing Transverse Lines (Up To and Including Six (6) Inch Width), Note: Base Unit For Removal</td>
<td>$1.75</td>
<td>$1.75</td>
<td>LF</td>
<td>100</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>C6. 37</td>
<td>Removal of Existing Transverse Lines (Each Additional Six (6) Inch Increment), Note: Add To Base Unit For Lines Wider Than Six (6) Inches</td>
<td>$1.75</td>
<td>$1.75</td>
<td>LF</td>
<td>100</td>
<td>$</td>
<td>$</td>
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<tr>
<td>C6. 38</td>
<td>Removal of Existing Symbols, Letters, or Arrows</td>
<td>$125.00</td>
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**SIGNAGE**

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<th>EA/PCS</th>
<th>Rate (EA)</th>
<th>Unit</th>
<th>EA/PCS</th>
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<tbody>
<tr>
<td>C6. 39</td>
<td>Traffic Control Sign (Typical Stop, Yield, No Parking, Speed Limit, or Similar), Install per Detail SG-1.0</td>
<td>$250.00</td>
<td>$250.00</td>
<td>EA</td>
<td>100</td>
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<td>$</td>
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<td>C6. 40</td>
<td>Traffic Control Sign (Typical Stop, Yield, No Parking, Speed Limit, or Similar), Relocate with Existing Post</td>
<td>$50.00</td>
<td>$50.00</td>
<td>EA</td>
<td>100</td>
<td>$</td>
<td>$</td>
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<tr>
<td>C6. 41</td>
<td>Traffic Control Sign (Typical Stop, Yield, No Parking, Speed Limit, or Similar), Relocate with New Post</td>
<td>$200.00</td>
<td>$200.00</td>
<td>EA</td>
<td>25</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>C6. 42</td>
<td>Traffic Control Sign (Typical Stop, Yield, No Parking, Speed Limit, or Similar), Mount Sign to Light or Utility Pole</td>
<td>$200.00</td>
<td>$200.00</td>
<td>EA</td>
<td>25</td>
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**C.7 LANDSCAPE AND HARDSCAPE RESTORATION WORK**

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<th>Description</th>
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<th>Rate (CY)</th>
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<td>C7. 1</td>
<td>Topsoil</td>
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<td>CY</td>
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<td>C7. 2</td>
<td>Topsoil for Street Trees, Backfill Soil Mixture of 3/4 Existing Soil and 1/4 Organic Material (per DPR Specification)</td>
<td>$65.00</td>
<td>$65.00</td>
<td>CY</td>
<td>250</td>
<td>$</td>
<td>$</td>
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<td>C7. 3</td>
<td>Topsoil for Street Trees, Purchased Mixture (per DPR Specification)</td>
<td>$65.00</td>
<td>$65.00</td>
<td>CY</td>
<td>250</td>
<td>$</td>
<td>$</td>
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<td>C7. 4</td>
<td>Mulch, Shredded Hardwood (Sterile)</td>
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<td>$40.00</td>
<td>CY</td>
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<td>$</td>
<td>$</td>
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<tr>
<td>C7. 5</td>
<td>Seed, Mixture of 85% Tall Fescue/Bluegrass and 15% Annual Ryegrass</td>
<td>$1.00</td>
<td>$1.00</td>
<td>SY</td>
<td>100</td>
<td>$</td>
<td>$</td>
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<td>C7. 6</td>
<td>Sod, Tall Fescue/Bluegrass Mixture</td>
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<td>SY</td>
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<td>Tree and Shrub - Remove and Dispose, Up to 6&quot; DBH (Diameter at Breast Height)</td>
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<td>Wooden or Vinyl Fence (Typical Privacy, Picket, or Similar), Remove &amp; Replace, Height Up to 6'</td>
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<td>Bus Shelter 6' Bench (Supplemental Spec 13130)</td>
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<td>Bus Shelter Media Vending Machines (Supplemental Spec 13140)</td>
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<td>Bus Shelter Trash Receptacles (Supplemental Spec 13140)</td>
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<td>Bus Shelter LED Light Fixtures (Supplemental Spec 13150)</td>
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<td>Bus Shelter (Any Type and All Furnishings), Remove and Dispose, or Remove and Salvage</td>
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<td>C7. 38</td>
<td>Landscape/Retaining Wall, Excluding Foundation (Segmental Non-Reinforced Interlocking Concrete Wall), Height Less Than 3' Exposed Face (Versa-Lok, or County Approved Alternate System)</td>
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<td>C7. 39</td>
<td>Landscape/Retaining Wall (Block, Brick, Segmental, or Similar), Height Less Than or Equal to 3' Exposed Face, Remove and Dispose (Foundation Removal Paid Separately under Rock Excavation)</td>
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**BIDDER NAME:** ARTHUR CONSTRUCTION
### ITB 562-14 - ATTACHMENT A - BID FORM (PRICING SHEET)

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<td>Landscape/Retaining Wall (Block, Brick, Segemental, or Similar), Height Greater Than 3' Exposed Face, Remove and Dispose (Foundation Removal Paid Separately Under Rock Excavation)</td>
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<td>C7. 46</td>
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### C8. EROSION AND SEDIMENT CONTROL WORK

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<td>Storm Drain Inlet Protection, Silt Fence Drop Inlet Application (per Virginia Erosion &amp; Sediment Control Handbook Standard &amp; Specification 3.07)</td>
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<td>C8. 4</td>
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<td>C8. 5</td>
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<td>C8. 6</td>
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**BIDDER NAME:** ARTHUR CONSTRUCTION
## C9. MATERIALS TESTING WORK

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## C10. UNLISTED WORK

### DIRECT HOURLY LABOR / EQUIPMENT RATES

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<td>C10. 2</td>
<td>Backhoe With Operator</td>
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<td>C10. 3</td>
<td>Tender/Tri-Axle Dump Truck With Driver</td>
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<td>C10. 4</td>
<td>Single Axle Dump Truck With Driver</td>
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<td>Labor - Pipe Layer</td>
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<td>Labor - Concrete Finisher</td>
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<td>C10. 7</td>
<td>Labor - Manhole Builder</td>
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<td>Labor - Skilled</td>
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<td>Labor - Unskilled</td>
<td>$20.00</td>
<td>$20.00</td>
</tr>
<tr>
<td>C10. 10</td>
<td>Flagman</td>
<td>$15.00</td>
<td>$15.00</td>
</tr>
<tr>
<td>C10. 11</td>
<td>Misc. Equipment Operator</td>
<td>$30.00</td>
<td>$30.00</td>
</tr>
<tr>
<td>C10. 12</td>
<td>Backhoe</td>
<td>$95.00</td>
<td>$95.00</td>
</tr>
<tr>
<td>C10. 13</td>
<td>Rubber Tire Loader</td>
<td>$100.00</td>
<td>$100.00</td>
</tr>
<tr>
<td>C10. 14</td>
<td>Skid Steer Loader</td>
<td>$75.00</td>
<td>$75.00</td>
</tr>
<tr>
<td>C10. 15</td>
<td>Track Excavator</td>
<td>$150.00</td>
<td>$150.00</td>
</tr>
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**BIDDER NAME:** Arthur Construction
### C10. Equipment Costs

<table>
<thead>
<tr>
<th>Item Description</th>
<th>Rate 1</th>
<th>Rate 2</th>
<th>Quantity</th>
<th>Rate 3</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air Compressor With Tools</td>
<td>$40.00</td>
<td>$40.00</td>
<td>Hourly</td>
<td>40</td>
<td>$</td>
</tr>
<tr>
<td>Tool Truck or Trailer</td>
<td>$40.00</td>
<td>$40.00</td>
<td>Hourly</td>
<td>80</td>
<td>$</td>
</tr>
<tr>
<td>Trench Compactor</td>
<td>$40.00</td>
<td>$40.00</td>
<td>Hourly</td>
<td>40</td>
<td>$</td>
</tr>
<tr>
<td>Pavement Breaker</td>
<td>$35.00</td>
<td>$35.00</td>
<td>Hourly</td>
<td>40</td>
<td>$</td>
</tr>
<tr>
<td>Welding (Includes All Labor And Equipment)</td>
<td>$35.00</td>
<td>$35.00</td>
<td>Hourly</td>
<td>40</td>
<td>$</td>
</tr>
<tr>
<td>Lighting With Generator</td>
<td>$30.00</td>
<td>$30.00</td>
<td>Hourly</td>
<td>40</td>
<td>$</td>
</tr>
<tr>
<td>Roadway Steel Plates - EA</td>
<td>$250.00</td>
<td>$250.00</td>
<td>Daily</td>
<td>10</td>
<td>$</td>
</tr>
<tr>
<td>Excavation Trench Box - EA</td>
<td>$400.00</td>
<td>$400.00</td>
<td>Daily</td>
<td>10</td>
<td>$</td>
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<tr>
<td>Electronic Arrow Board</td>
<td>$10.00</td>
<td>$10.00</td>
<td>Hourly</td>
<td>80</td>
<td>$</td>
</tr>
<tr>
<td>Work Zone Set-Up - Includes Signs, Channelizers And Cones</td>
<td>$750.00</td>
<td>$750.00</td>
<td>Daily</td>
<td>10</td>
<td>$</td>
</tr>
<tr>
<td>Boom Truck</td>
<td>$200.00</td>
<td>$200.00</td>
<td>Hourly</td>
<td>40</td>
<td>$</td>
</tr>
<tr>
<td>Tractor Trailer</td>
<td>$175.00</td>
<td>$175.00</td>
<td>Hourly</td>
<td>40</td>
<td>$</td>
</tr>
<tr>
<td>4&quot; or Greater Dewatering Pump</td>
<td>$100.00</td>
<td>$100.00</td>
<td>Daily</td>
<td>10</td>
<td>$</td>
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</table>

### C11. MGT and Re-Mobilization Work

<table>
<thead>
<tr>
<th>Description</th>
<th>Rate 1</th>
<th>Rate 2</th>
<th>Total 1</th>
<th>Total 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maintenance of Traffic (MGT) - multiplier, expressed as a percentage, to be added to the total amount of each project assignment cost. (For example, estimating an average project assignment cost of $150,000 and a 1% multiplier = 0.01 x $150,000 = $1,500 would be added to the project assignment cost)</td>
<td>$2.00</td>
<td>$2.00</td>
<td>$3,000,000</td>
<td>$</td>
</tr>
<tr>
<td>Re-Mobilization - multiplier, expressed as a percentage, to be added to the total amount of each project assignment cost. (For example, estimating an average project assignment cost of $150,000 and a 1% multiplier = 0.01 x $150,000 = $1,500 would be added to the project assignment cost)</td>
<td>$2.00</td>
<td>$2.00</td>
<td>$3,000,000</td>
<td>$</td>
</tr>
<tr>
<td>LINE ITEM NUMBER</td>
<td>LINE ITEM DESCRIPTION</td>
<td>UNIT PRICE (UP)</td>
<td>UNITS</td>
<td>TOTAL ESTIMATED ANNUAL QUANTITY (TEQ)</td>
</tr>
<tr>
<td>------------------</td>
<td>-----------------------</td>
<td>-----------------</td>
<td>-------</td>
<td>-------------------------------------</td>
</tr>
<tr>
<td>M1. 1</td>
<td>Concrete Curb, Standard Header Curb C-3 (Detail R-2.6), includes curb for aprons, ramps, etc.</td>
<td>$22.00</td>
<td>LF</td>
<td>1,300</td>
</tr>
<tr>
<td>M1. 2</td>
<td>Concrete Curb, Mountable Curb at Traffic Circle (Detail R-2.7)</td>
<td>$22.00</td>
<td>LF</td>
<td>200</td>
</tr>
<tr>
<td>M1. 3</td>
<td>Concrete Curb, Standard 6&quot; (VDOT CG-2), includes curb for aprons, ramps, etc.</td>
<td>$22.00</td>
<td>LF</td>
<td>500</td>
</tr>
<tr>
<td>M1. 4</td>
<td>Concrete Curb, Standard 4&quot; (VDOT CG-3), includes curb for aprons, ramps, etc.</td>
<td>$22.00</td>
<td>LF</td>
<td>500</td>
</tr>
<tr>
<td>M1. 5</td>
<td>Concrete Curb &amp; Gutter, Standard C-2 and C-2R (Detail R-2.6), includes curb &amp; gutter for aprons, ramps, etc.</td>
<td>$22.00</td>
<td>LF</td>
<td>10,000</td>
</tr>
<tr>
<td>M1. 6</td>
<td>Concrete Curb &amp; Gutter, Combination 6&quot; (VDOT CG-6), includes curb &amp; gutter for aprons, ramps, etc.</td>
<td>$25.00</td>
<td>LF</td>
<td>500</td>
</tr>
<tr>
<td>M1. 7</td>
<td>Concrete Curb &amp; Gutter, Combination 4&quot; (VDOT CG-7), includes curb &amp; gutter for aprons, ramps, etc.</td>
<td>$25.00</td>
<td>LF</td>
<td>500</td>
</tr>
<tr>
<td>M1. 8</td>
<td>Concrete Sidewalk, 4&quot; Thickness (Detail R-2.6)</td>
<td>$40.50</td>
<td>SY</td>
<td>5,000</td>
</tr>
<tr>
<td>M1. 9</td>
<td>Concrete Sidewalk, 6&quot; Thickness</td>
<td>$54.00</td>
<td>SY</td>
<td>50</td>
</tr>
<tr>
<td>M1. 10</td>
<td>Concrete Pavers (Detail R-2.1)</td>
<td>$200.00</td>
<td>SY</td>
<td>10</td>
</tr>
<tr>
<td>M1. 11</td>
<td>Concrete Pavers, Remove and Reset (Detail R-2.1)</td>
<td>$150.00</td>
<td>SY</td>
<td>75</td>
</tr>
<tr>
<td>M1. 12</td>
<td>Concrete Paver Crosswalk (Detail R-2.6, including all materials as shown in detail)</td>
<td>$250.00</td>
<td>SY</td>
<td>10</td>
</tr>
<tr>
<td>M1. 13</td>
<td>Concrete Paver Crosswalk, Remove and Reset (Detail R-2.6, including all materials as shown in detail)</td>
<td>$180.00</td>
<td>SY</td>
<td>50</td>
</tr>
<tr>
<td>M1. 14</td>
<td>Concrete Driveway Entrance, 6&quot; Residential (Details R-2.4A, R-2.4B, R-2.4C, R-2.4D)</td>
<td>$58.50</td>
<td>SY</td>
<td>550</td>
</tr>
<tr>
<td>M1. 15</td>
<td>Concrete Driveway Entrance, 9&quot; Commercial (Details R-2.4A, R-2.4B, R-2.4C, R-4D)</td>
<td>$81.00</td>
<td>SY</td>
<td>250</td>
</tr>
<tr>
<td>M1. 16</td>
<td>Concrete Curb Ramps, (VDOT CG-12, Type A Application), including truncated dome detectable warning</td>
<td>$900.00</td>
<td>EA</td>
<td>10</td>
</tr>
<tr>
<td>M1. 17</td>
<td>Concrete Curb Ramps, (VDOT CG-12, Type B Application), including truncated dome detectable warning</td>
<td>$900.00</td>
<td>EA</td>
<td>10</td>
</tr>
<tr>
<td>M1. 18</td>
<td>Concrete Curb Ramps, (VDOT CG-12, Type C Application), including truncated dome detectable warning</td>
<td>$900.00</td>
<td>EA</td>
<td>10</td>
</tr>
<tr>
<td>M1. 19</td>
<td>Concrete Steps Each (Detail R-3.0, including all reinforcing bars as shown in detail)</td>
<td>$75.00</td>
<td>LF-W</td>
<td>10</td>
</tr>
<tr>
<td>M1. 20</td>
<td>Concrete and Formwork (VDOT Class A3), only when not included in other pay items</td>
<td>$300.00</td>
<td>CY</td>
<td>10</td>
</tr>
<tr>
<td>M1. 21</td>
<td>Concrete and Formwork (VDOT Class A4), only when not included in other pay items</td>
<td>$400.00</td>
<td>CY</td>
<td>5</td>
</tr>
</tbody>
</table>
## ITB 562-14 - ATTACHMENT A - BID FORM (PRICING SHEET)

<table>
<thead>
<tr>
<th>M1.</th>
<th>Description</th>
<th>Unit</th>
<th>Quantity</th>
<th>Rate</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>22</td>
<td>Steel Reinforcement, Welded Wire Fabric (VDOT Section 406), only when not included in other pay items</td>
<td>LB</td>
<td>50</td>
<td>$2.00</td>
<td>$100</td>
</tr>
<tr>
<td>23</td>
<td>Steel Reinforcement, Reinforcing Steel Bars #6 and smaller (VDOT Section 406), only when not included in other pay items</td>
<td>LB</td>
<td>75</td>
<td>$3.00</td>
<td>$225</td>
</tr>
<tr>
<td>24</td>
<td>Steel Reinforcement, Reinforcing Steel Bars #7 up to #10 (VDOT Section 406), only when not included in other pay items</td>
<td>LB</td>
<td>75</td>
<td>$4.00</td>
<td>$300</td>
</tr>
<tr>
<td>25</td>
<td>Concrete Catch Basin, Remove &amp; Replace Top</td>
<td>EA</td>
<td>10</td>
<td>$3,000.00</td>
<td>$30,000</td>
</tr>
<tr>
<td>26</td>
<td>Brick Pavers, Including Concrete Base (Detail R-2.1)</td>
<td>SY</td>
<td>10</td>
<td>$180.00</td>
<td>$1,800</td>
</tr>
<tr>
<td>27</td>
<td>Brick Pavers, Remove and Reset (Detail R-2.1)</td>
<td>SY</td>
<td>25</td>
<td>$150.00</td>
<td>$3,750</td>
</tr>
</tbody>
</table>

## M2. MOT WORK

<table>
<thead>
<tr>
<th>M2.</th>
<th>Description</th>
<th>Unit</th>
<th>Quantity</th>
<th>Rate</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Maintenance of Traffic (MOT) - multiplier, expressed as a percentage, to be added to the total amount of each project assignment cost. (For example, estimating an average project assignment cost of $150,000 and a 1% multiplier = 0.01 x $150,000 = $1,500 would be added to the project assignment cost)</td>
<td>$</td>
<td>2.00</td>
<td>2.00</td>
<td>$500,000</td>
</tr>
</tbody>
</table>

**BIDDER NAME:** ARTHUR CONSTRUCTION
SEALED BIDS WILL BE RECEIVED IN HAND IN THE OFFICE OF THE BID CLERK, SUITE 511, 2100 CLARENDON BOULEVARD, ARLINGTON, VA 22201, UNTIL 2 P.M. ON THE 5TH DAY OF MARCH, 2015 FOR:

Capital Improvement Project Work to consist generally of larger scale public works infrastructure and street improvement projects including construction, reconstruction, and maintenance of: State and County streets, curbs & gutters, sidewalks, walkways, driveway aprons, storm sewer pipes and inlets, pavement markings & signage, electrical conduits, traffic controls, streetscapes, and related site work.

At time, date and place above, bids will be publicly opened.

Bid Surety in the amount of not less than $25,000.00 (twenty five thousand dollars) must be submitted with the bid. Performance and Payment Bonds in the amount of $500,000.00 (five hundred thousand dollars) will be required of the successful bidder and must be maintained by the Contractor throughout the duration of the Contract.

YOU MAY DOWNLOAD AN ELECTRONIC COPY OF THE SPECIFICATIONS AND ADDENDUM FOR THIS SOLICITATION AT NO COST USING THE FOLLOWING LINKS:

LINK TO ATTACHMENTS:
https://egov.arlingtonva.us/ProcureDocs/562-14/Addendums.zip

LINKS TO ALL SPECIFICATIONS CAN BE FOUND IN SUBSECTION H OF SECTION III “SPECIAL CONDITIONS”

A prebid conference will be held at 3.00 pm, Tuesday, February 3rd, 2015 in Cherry Conference Room of Arlington County Government office located at 2100 Wilson Blvd, Arlington VA. ATTENDANCE IS OPTIONAL. Minutes of the prebid conference will be recorded by the County and will be incorporated into the solicitation documents through an amendment. Interested bidders are 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

Igor Scherbakov
Procurement Officer
ischerbakov@arlingtonva.us
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<td>III. SUPPLEMENTARY SPECIFICATIONS</td>
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<tr>
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<td>ESCROW AGREEMENT</td>
<td>115</td>
</tr>
<tr>
<td>ATTACHMENT A – PRICING SHEET</td>
<td></td>
</tr>
</tbody>
</table>
I. INSTRUCTIONS TO BIDDERS

1. ADDITIONAL INFORMATION
All questions relating to this solicitation shall be submitted in writing via email to Igor Scherbakov in the Office of the Purchasing Agent, at ischerbakov@arlingtonva.us. For a question to be considered, the subject line of the email must state the following: “ITB No. 562-14 Questions”. Questions should be succinct and must include the submitter's name, title, company name, company address, and telephone number. Prior to the award of a contract resulting from this solicitation, bidders are prohibited from contacting County staff, other than the Office of the Purchasing Agent.

NO QUESTIONS WILL BE CONSIDERED IF THEY ARE SUBMITTED AFTER FEBRUARY 26, 2015 AT 5:00 PM.

If any questions or responses require revisions to the solicitation as originally published, such revisions will be by formal amendment only. Bidders are cautioned that any written or oral representations made by any County representative or other person that appear to change materially any portion of the solicitation shall not be relied upon unless subsequently ratified by a written amendment to this solicitation issued by the Office of the Purchasing Agent.

2. COMPETITION INTENDED
It is the County's intent that this solicitation permits competition. It shall be the bidder's responsibility to advise the County if any language, requirements or specifications restrict or limit the purchase to a single source. Such notification must be received by the County Purchasing Agent not later than fifteen (15) calendar days prior to the date and time set for bid opening. A review of such notifications will be made and the bidder notified of the results of the review.

3. BID FORM SUBMISSION
The REQUIRED Bid Form is provided in the solicitation. One (1) fully-completed Bid Form with original longhand signature, and a photocopy of the signed original (two (2) copies total), shall be submitted in hand, in a sealed envelope or package, to the Office of the Bid Clerk, Suite 511, 2100 Clarendon Boulevard, Arlington, Virginia, 22201, no later than the date and time specified in the Invitation To Bid above. Timely submission is solely the responsibility of the bidder. Bid Forms received after the specified time will be rejected. The exterior of the envelope or package shall indicate the name of the bidder, the scheduled bid opening date and time, and the number of the Invitation To Bid. Bids submitted by facsimile or electronically will not be accepted.

A bidder’s failure to submit a bid with a fully-completed Bid Form, using the Bid Form provided in this solicitation, shall be considered cause for rejection of that bidder's bid. A bid will be rejected if its corresponding Bid Form is not signed in the designated space by a person authorized to legally bind the bidder.

Modification of or additions to any portion of the solicitation may be cause for rejection of the bid; however, the County reserves the right to decide, on a case by case basis, in its sole discretion, whether or not to reject such a bid as nonresponsive. As a precondition to bid acceptance, the County may, in its sole discretion, request that the bidder withdraw or modify
nonresponsive portions of a bid which do not affect quality, quantity, price, or delivery.

Bids and all documents related to this solicitation submitted to the County by a bidder or a prospective bidder shall, upon receipt by the County, become the property of the County.

4. BIDDER CERTIFICATION
Submission of a signed Bid Form is certification by the respective bidder that it is registered with the Virginia State Corporation Commission, if applicable, it is a 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 according to the terms and conditions set forth in this Invitation to Bid.

5. ERRORS IN EXTENSION
Where the unit price and the extension price are at variance, the unit price will prevail.

6. EXCEPTIONS
Bidders taking exception to any part or section of this solicitation, including, by way of illustration and not limitation, the Contract Documents, Contract Terms and Conditions, General Conditions, Specifications, the Special Conditions, and any attachments or references thereto, shall indicate such exceptions on the Bid Forms. Failure to indicate any exceptions shall be interpreted as the bidder's intent to fully comply with the solicitation as written. However, conditional or qualified bids with such exceptions, unless specifically allowed in the solicitation, are subject to rejection in whole or in part as nonresponsive.

7. NONCONFORMING TERMS AND CONDITIONS
If the bidder submits with its bid 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 the bidder to withdraw nonconforming terms and conditions from its bid prior to a determination by the County of nonresponsiveness as a result of the submission of nonconforming terms and conditions.

8. EXPENSES INCURRED IN PREPARING BID
The County accepts no responsibility for any expense incurred by any bidder in the preparation and presentation of a bid. All expenses related to a bid are the sole responsibility of the bidder.

9. BIDDER INVESTIGATIONS
Before submitting a bid, each bidder shall make all investigations and examinations necessary to ascertain all conditions and requirements affecting the full performance of the Contract and to verify any representations made by the County that the bidder will rely upon. No pleas of ignorance of such conditions and requirements resulting from failure to make such investigations and examinations will relieve the successful bidder from its obligation to comply in every detail with all provisions and requirements of the Contract documents or will be accepted as a basis for any claim whatsoever for any monetary consideration on the part of the successful bidder.
10. **SITE INVESTIGATION AND CONDITIONS AFFECTING THE WORK**

Each bidder acknowledges by submitting a bid that it has taken steps reasonably necessary to ascertain the nature and locations of the Work of the solicitation, 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 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 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 publicly or otherwise available, as well as from the drawings and specifications made a part of this solicitation. Any failure of a bidder to take the actions described and acknowledged in this paragraph will not relieve the bidder 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 operations. The bidder shall make all necessary investigations to determine the existence and locations of such utilities. The bidder 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 or as called for in the Contract Documents, then such additional work will be ordered under the terms of the clause entitled “Changes in Work”.

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 can 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.

11. **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 County Purchasing Agent immediately upon discovery of any apparent or suspected incomplete direction or instruction or inaccuracy, error in, or omission of any sentence, paragraph, 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 potential bidder downloaded an electronic version of the solicitation documents, such potential bidder is responsible for determining the accuracy and completeness of the electronic documents.

If the Contractor 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 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 the County.

12. ERRONEOUS OR OTHERWISE COMPROMISED REQUIREMENTS
Each bidder is responsible for having determined the feasibility of the work required, and shall notify the County Purchasing Agent immediately upon any 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 Contract Term.

13. QUALIFICATION OF BIDDERS
Each bidder may be required, before the award of contract, to show to the complete satisfaction of the Purchasing Agent 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. Each bidder may also be required to provide past history and references which will enable the Purchasing Agent to be satisfied as to the bidder's qualifications. Failure to qualify according to the foregoing requirements will result in bid rejection by Arlington County.

14. DEBARMENT STATUS
The bidder shall indicate in the space provided on the bid form, whether or not it, or any of its principals, is/are currently debarred from submitting bids to Arlington County, Virginia or any political subdivision or agency of the Commonwealth of Virginia, and whether or not it is an agent of any person or entity that is currently debarred from submitting bids to Arlington County, Virginia or any other state or political subdivision. An affirmative response may be considered grounds for rejection of the bid.

15. 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 goods, services or construction being procured. If insufficient information is submitted for the County to properly evaluate the bid by a bidder; the County reserves the right to require such additional information as it may deem necessary after the bid opening time and date, provided that the information requested does not change the price, quality, quantity, or delivery schedule for the goods, services, or construction being procured.

16. USE OF BRAND NAMES
Unless identified as a "No Substitute" 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. Any article which the County in its sole discretion determines to be the equivalent of the article specified, considering quality, workmanship, economy of operation, and suitability for the intended use, may be accepted and considered for award.

For those items not identified as “No Substitute”, 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 specifics of the proposed item. Attach any technical information, photographs, brochures or other relevant data supporting the proposed item that permits 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, in its analysis, will consider factors such as relative costs, equivalency of features, serviceability, the design of the item proposed, and/or pertinent performance factors as provided in the project technical specifications.
4) All pages of the submission shall be marked with the name, address and contact information of the bidder, and sent 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 ischerbakov@arlingtonva.us.

County Review of Proposed Equivalent Item(s):
1) Approved item(s) will be added to the solicitation, in the form of an amendment 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 amendment.

17. **NEW MATERIAL**
Unless otherwise provided for in this solicitation, the bidder represents and warrants that the goods, materials, supplies, or components offered to the County under this bid solicitation are 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 the bidder believes that furnishing used or reconditioned goods, materials, supplies or components will be in the County's interest, the bidder shall so notify the County Purchasing Agent in writing no later than ten (10) business 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.

18. **ESTIMATED QUANTITIES/NON-EXCLUSIVITY OF CONTRACTOR ACKNOWLEDGEMENT**
Bidders acknowledge that the contract that will be entered into as a result of this solicitation will not obligate the County to purchase a specific quantity of items or services during the Contract Term. Any quantities which are included in the Contract Documents are the present expectations of those who are planning for the County for the period of the Contract. The amount is only an estimate and the Contractor understands and agrees that the County is under no obligation to the Contractor to buy that amount, or any amount as a result of having provided this estimate or of having had any normal or otherwise measurable requirement in the past. Bidders further understand that the County may require goods and/or services in excess of the estimated annual contract amount and that such excess shall not give rise to any claim for compensation other than at the unit prices and/or rates set forth in the resulting Contract. Further, bidders acknowledge that the items or services covered by this contract may be available or become available under other County contract(s), and that in analyzing its needs, the County may determine that it is in its best interest to procure the items or services through such other contract(s). Therefore, the County does not guarantee that the Contractor will be the exclusive provider of the goods or services covered by the resulting contract.

19. **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, 2100 Clarendon Blvd., Suite 200, Arlington, Virginia, 22201, telephone number (703) 228-3060.

20. **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 limited liability partnership shall 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 full and legal name of the firm or entity and the identification number issued to the bidder by the Virginia State Corporation Commission must be written in the space provided on the Bid Form.
Any bidder that is not required to be authorized to transact business in Virginia shall include in its bid a statement describing why the bidder is not required to be so authorized. The County may require a firm to provide documentation prior to award which: 1) clearly identifies the complete name and legal form of the firm or entity (i.e. corporation, limited partnership, etc.), and 2) establishes that the firm or entity is authorized by the State Corporation Commission to transact business in the Commonwealth of Virginia. Failure of a prospective and/or successful bidder to provide such documentation shall be grounds for rejection of the bid or cancellation of the award. For further information refer to the Commonwealth of Virginia State Corporation Commission website at: [www.scc.virginia.gov](http://www.scc.virginia.gov).

21. **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 bidder fails to obtain this license prior to submission of bid, the bid shall not be considered.

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.

22. **BID WITHDRAWAL PRIOR TO BID OPENING**

No bid can be withdrawn after it is filed with the Bid Clerk unless the bidder makes a request in writing to the Purchasing Agent prior to the time set for the opening of bids.

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 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 a bid are permitted after the time and date set for the bid opening. The bidder must give notice in writing to the County Purchasing Agent of a claim of right to withdraw a bid and provide all original work papers, documents and other materials used in the preparation of the bid sought to be withdrawn, within two (2) business days after the 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. PARKING
At most County locations, parking for the Contractor's vehicles is not provided by the County. The Contractor is responsible for the payment of any parking charges or fines resulting from illegal parking at any of the sites.

25. TRADE SECRETS OR PROPRIETARY INFORMATION
Trade secrets or proprietary information that is submitted by a bidder or contractor in connection with a procurement transaction or prequalification application submitted pursuant to subsection 4-101(2) of the Arlington County Purchasing Resolution may be exempted from public disclosure under the Virginia Freedom of Information Act ("VFOIA"). However, the bidder or contractor must invoke the protection of this subsection prior to or upon submission of the data or other materials, and must identify clearly and in writing, on the Bid Form, the data or other materials to be protected and state the reasons why protection is necessary or falls within the exception to the VFOIA. It is the bidder's sole responsibility to defend such exemptions if challenged in a court of competent jurisdiction.

26. INTEREST IN MORE THAN ONE BID AND COLLUSION
Multiple bids received in response to this solicitation from an individual, firm, partnership, corporation, affiliate, or association under the same or different names will be rejected. Reasonable grounds for believing that a bidder is interested in more than one (1) bid for a solicitation both as a bidder and as a subcontractor for another bidder will result in rejection of all bids in which the bidder is interested. However, a firm acting only as a subcontractor may be included as a subcontractor for two (2) or more bidders submitting a bid for the work. Any or all bids may be rejected if reasonable grounds exist for believing that collusion exists among any bidders. Bidders rejected under the above provisions shall be disqualified if they respond to a re-solicitation for the same work.

27. METHOD OF AWARD
The County will make the award for this solicitation to the lowest responsive and responsible bidder.

The lowest bidder will be determined by a pre-determined, sealed formula based on estimated quantities extracted from historical data. This formula will be unsealed at the bid opening, and become a public record at that time.

28. INSURANCE REQUIREMENTS
Each bidder must review the insurance requirements section carefully with its insurance agent or broker prior to submitting a bid to ensure they can provide the specific coverage requirements and limits applicable to this solicitation. If the bidder is not able to meet the insurance requirements of the solicitation, alternate insurance coverage satisfactory to Arlington County may be proposed by the bidder and considered by the County.
requests for consideration of alternate coverage must be received by the County Purchasing Agent at least ten (10) working days prior to the date set for receipt of bids. If the County denies the request for alternate coverage, the coverage required by the Insurance Requirements section must be provided. 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. The insurance requirements herein shall neither operate as a limitation of the Contractor’s liability to the County nor as a limitation of the Contractor’s duty of indemnification, as set forth in this solicitation and any resulting Contract.

29. **SURETY REQUIRED**

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 $25,000.00 (twenty five thousand dollars) made payable to the Treasurer of Arlington County shall accompany each bid. The Bid Surety of all bidders may be retained until after the award to the successful bidder is made. The Bid Surety of the successful bidder shall be retained until completion of the Contract or the posting of a Performance Bond, whichever occurs sooner. A bid submitted without a bid surety, or with a bid surety in an amount less than the required amount, shall be rejected.

B. **Failure to Execute:** The failure to accept an award and file acceptable Performance and Payment Bonds within fifteen (15) days after notice of intent to award shall be just cause for cancellation of the award and the forfeiture of the Bid Surety to the County as liquidated damages. Award may then be made to the next lowest responsive and responsible bidder.

C. **Performance Surety:** A fully completed and properly executed original Performance Bond in the amount of $500,000.00 (Five hundred thousand dollars) will be required of the successful bidder and must be maintained by the Contractor throughout the duration of the Contract 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 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 $500,000.00 (Five hundred thousand dollars), conditioned upon the 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, will be required of the successful bidder and must be maintained by the Contractor throughout the duration of 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 Term.
E. Alternate Surety: If approved by the County Attorney, a bidder may furnish a personal bond, property bond, or bank or saving and loan association's letter of credit on certain designated funds in the face amount required for the bid bond, payment bond or performance bond. Approval shall be granted only upon a determination by the County that the alternative form of security proffered affords protection to the County equivalent to a corporate surety's bond.

30. **OPTIONAL ESCROW AGREEMENT**
If the successful bidder so elects, the bidder may utilize an escrow account for utilization of the retainage funds pursuant to § 2.2-4334 of the Code of Virginia. The bidder must indicate on the Bid Form whether or not it elects the escrow account procedure.

31. **EXECUTION OF AGREEMENT**
Within fifteen (15) calendar days after the Agreement forms are presented by the County to the successful Bidder for signature, the Contractor shall deliver to the County Purchasing Agent three (3) copies of the executed Agreement. Within the same fifteen (15) day period, the Contractor shall deliver to the County Purchasing Agent executed performance and payment bonds, if such are required in the solicitation, and the required certificate of insurance. The failure of the Contractor to execute the Agreement and to supply any required bonds and certificate, within the stipulated fifteen (15) day period, or within such extended period as the County Purchasing Agent may grant, 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.

32. **NOTICE OF DECISION TO AWARD**
When the County has made a decision to award a contract, an e-mail with a Notice of Decision to Award will be sent to all bidders, using the e-mail address provided in the Bid Form.
II. SPECIAL CONDITIONS

This Section shall conform to the Arlington County General Conditions except as modified herein.

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A. **GENERAL REQUIREMENTS**

The Contractor shall have five (5) continuous years of experience conducting public works infrastructure and street improvement projects. 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
- Pavement markings and signage
- Electrical conduits
- Traffic controls
- Streetscapes and related site work

The Contractor shall provide three (3) years of past performance history and current reference contact information for Bidder qualification verification. Failure to qualify according to the foregoing requirements will result in bid rejection by the Arlington County Purchasing Office.

The Contractor shall provide the following throughout the contract period of performance:

- All labor
- Supplies, tools, and equipment
- Transportation, mobilization
- MOT, erosion and sediment control
- Clearing and grubbing
- Demolition
- Saw-cutting
- Material provisions and installations
- Materials testing,
- Utility appurtenance adjustments
- All incidentals

The Contractor shall provide all resources to successfully perform the terms of this contract in accordance with project plans, compliance with Arlington County, VDOT Standards and Specifications.

The Contractor shall provide all resources to successfully complete multiple project assignments at multiple locations in accordance with the terms of this contract. The Contractor shall
have the ability to provide up to two (2) experienced self-
sufficient crews upon request by Arlington County representatives.

The Contractor shall provide verifiable proof prior to contract
award that it currently possess the facilities, ability, and
financial resources to comply with all terms and conditions of
this contract. The Contractor shall agree to furnish all
services, material or goods specified for a satisfactory or above
performance throughout the life of this contract or amendments.

B. **JOB SIZE LIMITATION & ESTIMATED ACTIVITY**
The size of the assigned jobs may vary throughout the contract
term, but shall not exceed $500,000 per project assignment. Based
on previous similar County contracts for similar work, the County
estimates contract activity of approximately $3,000,000 per year
(this is for informational purposes only, and shall not imply
minimum or maximum contract activity).

C. **OTHER COUNTY CONTRACTS**
The County reserves the right to include bid items or services
listed in this contract for use in other County bids without any
obligation for the remuneration to the Contractor for similar or
same items contained in this contract. Arlington County may
solicit separate bids for work specified under this contract which
may include items or services from other projects. Arlington
County will solicit separate bids for all projects over $500,000,
and work that requires special bidding provisions (i.e. use of the
non-County funds).

D. **CONTRACTOR RESPONSIBILITY AND SUBCONTRACTORS**
The County's review and/or acceptance of Subcontractors shall not
relieve the prime Contractor of its responsibilities, duties and
liabilities hereunder. The Contractor shall remain solely
responsible to the County for the following:

- All acts and defaults
- Omissions of its Subcontractors’
- Subcontractors' employees
- Omissions of its Officers or authorized representatives

Nothing contained in this contract shall be construed as consent
to create any contractual relationship between any Subcontractors
and Arlington County. Arlington County reserves the right to
expand or modify section (D): Contractor Responsibility and
Subcontractors and adapt to changing terms and conditions of this
contract.

E. **COUNTY PROJECT OFFICER**
For each project a Construction Management Specialist/Project
Officer will be assigned to represent the County at time of award.
All Contractor instructions or requests shall be issued from or
submitted through the designated County Project Officer. The Contractor shall not comply with instructions received from other personnel without prior County Project Officer coordination.

F. CONTRACTOR PERSONNEL

The Contractor shall monitor and enforce employee discipline at all times while performing under this Contract. All work assignments shall be issued to proficient employees only under this contract. The Contractor shall provide a replacement employee at the request of the Project Officers if proficiency is deemed questionable.

The Contractor employees shall be certified personnel, including the Safety and Environmental Project Officers listed below. The Contractor shall have valid certification cards with them while on the project work site. The Contractor employees shall provide evidence of certification upon request from Virginia Department of Transportation (VDOT) or Arlington County personnel. If the requested certification cannot be provided, a cease work order may be issued for the affected task or work site location.

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

- **Safety Project Officers:**
  The Contractor shall have at least two (2) employees that are certified by VDOT in Basic Work Zone Traffic Control. One (1) Contractor employee shall be on-site 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 Contractor shall have at least two (2) employees certified by VDOT in Intermediate Work Zone Traffic Control. One (1) Contractor employee shall be on-site to provide supervision during work zone adjustments or changes to traffic control due to field conditions at all times.

- **Environmental Project Officers:**
  The Contractor shall have at least two (2) employees that have successfully completed the VDOT Erosion & Sediment Control Contractor Certification training. One (1) 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 during land disturbance activities.

The Contractor shall fully understand that improper installation, maintenance and removal of erosion and sediment control devices may result in revocation of the VDOT Erosion & Sediment Control Contractor Certification.

G. COUNTY ORDINANCES
The Contractor shall comply with all applicable County ordinances, including; the Noise Control, Erosion & Sediment Control, Storm Water Management, and Chesapeake Bay Preservation ordinances (Chapters 15, 57, 60, 61 of the County Code).

H. CONSTRUCTION STANDARDS
All work shall conform to project plans and specifications along with the current edition of following County and State Construction Standards:

- The Arlington County Department of Environmental Services (DES) Construction Standards and Specifications, a copy of which may be downloaded at no charge from the internet at: http://topics.arlingtonva.us/building/construction-standards-specifications/

- The Arlington County Department of Environmental Services (DES) Traffic Signal & Streetlight 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 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 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 Section III of this contract entitled “Supplementary Specifications”.

The Contractor shall have a copy of the aforementioned County and State Construction Standards, a copy of the project plans and specifications, and a copy of the appropriate permits available at the project site at all times when construction activity is occurring.

If there is any discrepancy between the project drawings/specifications and the County or State Construction Standards listed above, then the requirements of the project drawings/specifications shall prevail over the other documents. In case of conflict or inconsistency between the drawings and the specifications, the specifications shall govern. Anything shown on the drawings and not mentioned in the specifications or mentioned in the specifications and not shown on the drawings shall have the same effect as if shown or mentioned respectively in both. Technical specifications take priority over general specifications and detail drawings take precedence over general drawings. Special conditions take precedence over General Conditions. Any conflict or inconsistency in the drawings shall be submitted by the Contractor to the County Project Officer, whose decision thereon shall be conclusive.

The Contractor shall immediately notify the County Project Officer to request information and a resolution both verbally and in writing when there are differing site conditions, and/or when there are conflicts, errors, or omissions in the contract documents.

I. 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 sub-contractors, 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 their 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

**RFIs shall not be construed to be 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 within seven (7) business days for clarification.

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.

**J. PERMITS**

Permits required for individual projects may include, but are not limited to:

- County Land Disturbing Activities permit
- County Resource Protection Area (RPA) permit
- County Water Meter and Fire Hydrant Permits
- County Public ROW permit
- County Transportation ROW permit
- VA DEQ Virginia Storm water Management Program (VSMP) permit
- 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 aforementioned permits will be obtained by the County prior to the start of Work and/or shall be transferred to the Contractor as the named permittee prior to the start of Work. The Contractor is responsible for obtaining all other required permits not obtained by the County. The Contractor shall provide a Responsible Land
**K. MATERIALS**

The Contractor shall furnish and install all materials required for the Work. The Contractor shall submit to the County Project Officer full descriptions and details, and obtain County approval, of all materials required for completion of each project assignment as specified in the current edition of the Arlington County Construction Standards and Specifications. The Contractor shall not begin work until the County Project Officer has approved any submittals, unless otherwise directed by the County Project Officer.

**L. WORK HOURS AND SCHEDULE OF WORK**

The Contractor shall comply with **normal daytime work hours** as defined in the County Noise Control Ordinance, unless otherwise defined by the project plans and specifications (which are typically defined as 8:00 a.m. to 5:00 p.m.).

The Contractor shall comply with **restricted working hours** of 9:00 a.m. to 3:00 p.m. when working in Arlington County arterial streets. The Contractor shall comply with **restricted working hours** as defined by VDOT when working in the VDOT Right-Of-Way.

In addition, the County reserves the right to restrict working days and hours to accommodate special site conditions as required. Attached is a list of VDOT streets within Arlington County, an exhibit showing the Arlington County arterial streets, and the most current VDOT work hour schedule (subject to change per VDOT).

Scheduling the work shall be the sole responsibility of the Contractor. The County will not allow time extensions for the normal and seasonal weather conditions considered typical for a given month in accordance with the National Oceanic and Atmospheric Administration thirty year mean for National Airport (as described in the General Conditions).

During the performance of the work, the Contractor shall identify and report the causes for any delays attributable to the conditions deemed to be beyond the Contractor's control. These causes shall be identified in terms of operations affected and significant dates that encompass the periods of delay. The Contractor shall submit such information to the County Project Officer within two (2) business days of determining the need for delay, to make an evaluation of the claim for delay.

**M. GENERAL SITE CONTROLS**

The Contractor shall be responsible for securing their work area. The Contractor shall confine its access to right-of-way and
easement areas only, 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.

The Contractor shall maintain clear access to 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.

**N. MAINTENANCE OF VEHICULAR AND PEDESTRIAN TRAFFIC (MOT)**

All personnel, signs, barricades and any other items necessary for the maintenance of traffic and safety shall be provided by the Contractor. The Contractor shall maintain the use of appropriate vehicular and pedestrian controls across all roadways in front of the project and full conformance with all County and VDOT standards and safety requirements. The Contractor shall set up controls at the beginning of each work day and take down controls at the end of each work day, as applicable to each project, for the duration of the project.

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.

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.

Payment for MOT shall be based on the bid form. The payment will be a multiplier, expressed as a percentage, to be added to the total amount of the project assignment cost (applied only to the amount being invoiced). 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.

O. **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. 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.

The Contractor shall protect all existing trees within the Tree Protection Zone: the area surrounding individual trees or groups of trees to be protected during construction, and defined by the drip line of individual trees or the perimeter drip line of groups of trees, or as defined by the County Project Officer, unless otherwise indicated on the project plans.

P. **STAGING AND STORAGE**
Unless otherwise designated on the project plans, the Contractor shall be responsible for acquiring project staging and storage areas at no additional cost to the County. Typically, no such areas are provided on the project plans.

Q. **STAKEOUT AND CUT-SHEETS**
The County will provide stakeout and cut-sheets for construction at no cost to the Contractor. If the Contractor damages the stakeout or requires additional stakeout or surveying services, it shall be the responsibility of the Contractor to replace or obtain such services at its own expense.

Unique or particular stakeout requests shall be identified by the Contractor in writing with their work proposal for individual project assignments.

R. **MATERIALS TESTING**
All materials testing shall be in compliance with County Specification Section 01400 and the attached County Materials Testing Specification Reference Guide. This Guide reflects testing frequency which is subject to change at the County’s discretion. The Contractor shall engage the services of a
geotechnical company acceptable to the County to conduct all materials testing per the County and VDOT specifications. The County will pay the Contractor for material testing at the prices indicated on the Contractor’s Bid Form.

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 County personnel or County consultants to enter the site, inspect, and perform any additional testing for any and all materials (including soil, concrete, asphalt, etc.).

S. TEST PITS
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.

T. OVER-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 shall receive approval from the County Project Officer prior to performing the work.

Unit price bids shall include excavations from proposed final grade to a maximum depth of thirteen (13) inches for Local Roads and fourteen (14) inches for Arterial Roads excluding excavations for pipes and structures. If over-excavation is approved by the 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 gain written approval from the County Project Officer prior to performing any additional excavation will be performed as a cost to the Contractor and not to the County.
U. **WORK SITE DAMAGES**

The Contractor shall photograph or videotape existing site conditions that reflect trees, plantings, retaining walls, and other improvements adjoining the construction that might be misconstrued as damage caused by the work prior to the start of work.

Any damage to property, whether owned by the County or others, resulting from work performed under this Contract shall be repaired or replaced to the County's satisfaction at the Contractor's expense.

V. **SITE CLEAN-UP**

The Contractor shall frequently remove all refuse, rubbish, scrap materials, and debris from the site resulting from the Contractor's operations. The Contractor shall ensure the work site presents a neat and orderly appearance at all times.

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.

W. **DISPOSAL REQUIREMENTS**

The Contractor shall properly remove and dispose of all waste and debris generated by the Work or produced at the project site during the execution of this contract. Unit prices for all items specifying removal and/or disposal (whether disposed at a County site or at a site not specified) shall include all costs and fees for removal and disposal, unless specifically stated otherwise.

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).
X. **PAVEMENT MARKING**
The Contractor shall have a certified VDOT Pavement Marking Technician present during pavement marking operations. Pavement markings shall be installed on new roadways prior to opening the roadway to traffic as described in the supplementary specifications which includes requirements for temporary pavement markings.

Y. **AS-BUILT PLANS**
The Contractor shall maintain a set of red-line drawings. Red-line drawings, at a minimum, shall include the requirements set forth in Arlington County DES Construction Standards and Specifications Section 02550, Section 3.3. 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.

The complete set of red-line drawings shall be submitted to the County at the completion of the project. Final payments will be held until the complete set of red-line drawings are submitted to and approved by the County Project Officer.

Z. **CONTRACT PERFORMANCE**
County staff will inspect all Contractors' work under this contract, and will withhold payment for any work performed which is considered not in accordance with the plans and specifications. Payments withheld for this reason will be released upon receipt of the satisfactory evidence. The payment release will be determined by a site inspection by County Project Officer confirmation that the work has been corrected to Arlington County specifications.

Inspections by the County staff will occur within fourteen (14) days of work completion by the Contractor. All required corrections to the work shall be completed by the Contractor within seven (7) days of notice to Contractor at no additional cost to the County. Failure of the Contractor to correct any deficiency within the seven (7) day period shall result in the County contracting all corrections to other vendors and at the Contractor expense. Repeated violations of this provision may result in contract termination.

AA. **PAYMENTS AND CHANGE ORDERS**
Payments will be based on actual quantities and site measurements taken in the field by County staff using the Contract Unit Prices.

If the Contractor encounters additional work or quantities required to complete the work, the County Project Officer shall be immediately notified to verify the unforeseen condition and justify the additional work. The Contractor shall submit a written estimate for additional work within two (2) business days with the Project Officer’s approval. Failure to do so may result in denial of claims for additional payment.
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.

When the County Project Officer has identified and authorized payment for additional line items prior to work execution it will be paid for at the Unit Prices in the Bid Form for the appropriate work category.

**BB. FINAL COMPLETION**

Final Completion is considered accomplished when Arlington County has agreed that all the Work is completed in accordance with the terms of the contract and is accepted. The Contractor shall notify the County Project Officer that the project has reached Final Completion. The County Project Officer will, upon notification, schedule and invite all interested parties for a final walk-through. The County will determine during the walk-through if the work has been fully accomplished after the inspection and verification.

If the County Project Officer concurs that the project has reached final completion, the County will issue a “Notice of Final Completion”. Otherwise the Contractor will be given a punch-list of outstanding items that need to be addressed.

The Contractor shall correct or complete the punch-list items within thirty (30) business days of the issuance (except: landscaping which may not be in season, and final surface paving if applicable). The Contractor shall not submit final invoices until all items on the punch-list have been satisfactorily addressed and verified by the County Project Officer.

The date of Final Completion under the Contract is the milestone date on which the Final Completion condition is accomplished as determined by the County.

**CC. LIQUIDATED DAMAGES**

If the work under the contract is not completed within the time of completion specified on the Notice to Proceed, the County may assess liquidated damages. Refer to the “Liquidated damages” paragraph of the “Agreement and Contract terms and conditions” section.
DD. **CATEGORIES OF WORK**

The Work is divided into the following two (2) distinct categories:

1) **CAPITAL IMPROVEMENT PROJECT WORK CATEGORY**

2) **CONCRETE MAINTENANCE WORK CATEGORY**

Note that the Special Conditions declared for one work category do not apply to the Special Conditions declared for the other work category.

1) **CAPITAL IMPROVEMENT PROJECT WORK CATEGORY**

   a) **General Description**

   Capital Improvement Project Work shall consist generally of larger scale public works infrastructure and street improvement projects including construction, re-construction, and maintenance of the following:

   - State and County streets
   - Curbs & gutters
   - Sidewalks and walkways
   - Driveway aprons
   - Storm sewer pipes and inlets
   - Pavement markings and signage
   - Electrical conduits
   - Traffic controls
   - Streetscapes and related site work

   b) **Bid Form**

   Bidders shall indicate their pricing in the Bid Form using Unit Prices for all the various material and services required for this work category under this contract. The Bidder shall submit pricing for: **Base Bid Work, and Restricted Hours Work.**

   All Unit Prices on the Bid Form (except for Unlisted Work) shall reflect and be inclusive of all costs, including but not limited to:

   - Tasks
   - Labor
   - Supplies
   - Tools and equipment
   - Transportation and mobilization
   - Clearing and grubbing
   - Demolition
   - Saw-cutting
   - Material provisions and installations
• Disposals

The Bidders shall indicate all required resources to perform the work in accordance with project plans and specifications and in compliance with all Arlington County and VDOT Standards and Specifications.

Capital Improvement Project Work Category items shall be measured and paid at the Unit Prices listed in the Base Bid Work, and Restricted Hours Work as applicable.

• Restricted Hours Work:

  The work hours allowed in the VDOT Right-Of-Way and/or in the Arlington County arterial streets Right-Of-Way may vary for individual project assignments. In cases where work hours are restricted to **6 hours or less a day** per the approved Right-Of-Way permit, the Work shall be compensated for at the Unit Prices identified in the Restricted Hours Work section of the Bid Form.

Unlisted Work: The Bidder shall submit pricing for Unlisted Work that includes a schedule of equipment and labor hourly rates in the space provided on the Bid Form. Unlisted Work shall be determined in one or more of the following ways:

- Written estimate and acceptance by the County in a lump sum using the bid hourly rates,
- Cost-reimbursement using the bid hourly rates, or
- Other authorized method permitted under the Arlington County Purchasing Resolution.

c) Work Assignments

A Proposal Request (PR) will be sent via email by the County Project Officer to the Contractor along with project plans and documents including permits, and County project quantity and cost estimates. An acknowledgement from the Contractor shall occur within two (2) business days.

Within two (2) business days of the PR date sent, the Contractor may request and schedule an onsite pre-proposal meeting with the County.

Within five (5) business days of the PR date sent, the onsite pre-proposal meeting shall be held with the County and Contractor.

Within ten (10) business days of the PR date sent, the Contractor shall confirm the County’s project quantity and cost proposal to perform the work and notify the County of
any adjustments, a detailed construction schedule with milestones identified, and the names of the Site Supervisor, Registered Land Disturber, Project Safety Officer, and Project Environmental Officer.

The County will review the submitted documents upon receipt, and either accept and issue a County-approved **Purchase Order (PO)**, or reject and issue a **Notice to Meet (NTM)**. These notices shall be sent via email correspondence to the Contractor. An acknowledgement from the Contractor shall occur within two (2) business days.

- **Issuer of the PO:**
  With the issuance of the PO, the County Project Officer will schedule a pre-construction meeting with the Contractor, and (at County discretion) will schedule an on-site meeting with the Contractor and residents. After these meetings, the County Project Officer will issue a **Notice to Proceed (NTP)** to the Contractor stating the Commencement Date (the date on which the contract time will commence) and on which the Contractor is to begin the prosecution of the work required under the contract. The NTP will specify the time of completion of the contract. The County Project Officer will also issue cut sheets to the Contractor at this time. The Contractor shall be expected to begin project assignments within five (5) business days from issuance of the NTP, unless a longer time is stipulated by the County Project Officer. Failure of the Contractor to meet response time requirements will be considered grounds for termination of the contract.

- **Issuer of the NTM:**
  With the issuance of the NTM, the County Project Officer will schedule a meeting with the Contractor to resolve differences in quantities, costs, schedules, etc. If agreement is reached, then a PO will be issued. If no agreement can be met, the County reserves the right to continue negotiations with the Contractor or to publicly bid the subject project assignment as a separate contract. In the latter case, the Contractor shall be prohibited from bidding on the contract.
d) **Mobilization**

No separate payment shall be made by the County for mobilization, unless otherwise specified below in this section for re-mobilization. **The Contractor shall account for all mobilization costs within their pricing in the Bid Form.**

- **Re-mobilization:**
  
  If, due only to conditions created by the County or by unforeseen utility conflicts, the Contractor is directed by the County Project Officer to cease work on an assigned project and no other work can be performed, then the County will issue a ‘Cease-Work Order’. Under these conditions the Contractor shall be entitled to request (in writing) a re-mobilization fee upon resuming work on the project.

  Payment for re-mobilization shall be based on the bid form. The payment will be a multiplier (expressed as a percentage) to be added to the total price of the project assignment unit costs. The Contractor shall not be entitled to any re-mobilization fees that are the result of the Contractor’s work schedule or resource allocation, weather delays, or other factors not controlled by the County.

2) **CONCRETE MAINTENANCE WORK CATEGORY**

a) **General Description**

Concrete Maintenance Work shall consist generally of isolated projects to install new concrete facilities, or to repair and/or replace existing deficient concrete facilities, such as: curb & gutter, sidewalk, and driveway aprons as identified by the County Project Officer.

Concrete replacement items (and driveway apron installations) shall include appropriate restoration to include saw-cutting, nominally 12” (horizontal) of full depth asphalt patching, and 12” (horizontal) of clean fill and sod restoration.

b) **Bid Form**

Bidders shall indicate their pricing in the Bid Form using Unit Prices for all the various material and services required for this work category under this contract. The Bidder shall submit pricing for: **Base Bid Work, and Restricted Hours Work.**

All Unit Prices on the Bid Form (except for Unlisted Work) shall reflect and be inclusive of all costs, including but not limited to the following:

- **Tasks**
• Labor
• Supplies
• Tools and equipment
• Transportation and mobilization
• Clearing and grubbing
• Demolition
• Saw-cutting
• Material provisions and installations
• Disposals

The Bidders shall indicate all required resources to perform the work in accordance with project plans and specifications and in compliance with all Arlington County and VDOT Standards and Specifications.

Concrete Maintenance Work Category items shall be measured and paid at the Unit Prices listed in the **Base Bid Work, and Restricted Hours Work** as applicable.

**Restricted Hours Work:**
The work hours allowed in the VDOT Right-Of-Way and/or in the Arlington County arterial streets Right-Of-Way may vary for individual project assignments. In cases where work hours are restricted to 6 hours or less a day per the approved Right-Of-Way permit, the Work shall be compensated for at the Unit Prices identified in the Restricted Hours Work section of the Bid Form.

Work which is not covered by Unit Prices in the Bid Form for this work category (miscellaneous items such as pavers, header curbs, etc.) shall be compensated using the Unit Prices listed in the Capital Improvement Project Work Category.

c) **Work Assignments**
A Work Request Form will be sent via email by the County Project Officer to the Contractor. The Contractor will be expected to begin Work within thirty (30) calendar days of receiving the Work Request Form.

The Contractor shall begin repair of any Concrete Maintenance Work assignments which are explicitly identified by the County as safety hazards within seven (7) days of receiving the Work Request Form.
d) **Mobilization**

No separate payment shall be made by the County for mobilization, and the Contractor shall not be entitled to re-mobilization fees under this work category. **The Contractor shall account for all mobilization and re-mobilization costs within their pricing in the Bid Form.**
### III. SUPPLEMENTARY SPECIFICATIONS

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This Section shall conform to the Arlington County Construction Standards and Specifications of Section 02200 except as modified herein.

PART 4 - MEASUREMENT AND PAYMENT

25. Excavation

Delete: When explicitly included as a pay item, Excavation will be measured by the cubic yard as illustrated on the approved plans, or as approved by the Project Officer. Excavation in excess of that shown on the approved plans will not be compensated, unless specifically approved in advance by the Project Officer. Payment will include all labor, materials, and equipment and will include excavation, handling, storage and disposal of materials, backfilling, compaction, testing, and all other activities necessary to comply with these Specifications.

Add: When explicitly excluded as a pay item, Excavation will be measured by the cubic yard as illustrated on the approved plans, or as approved by the Project Officer. Excavation in excess of that shown on the approved plans will not be compensated, unless specifically approved in advance by the Project Officer. Payment will include all labor, materials, and equipment and will include excavation, handling, storage and disposal of materials, backfilling, compaction, testing, and all other activities necessary to comply with these Specifications.

26. Fill

Delete: When explicitly included as a pay item, Fill will be measured by the cubic yard in place as illustrated on the approved plans, or as approved by the Project Officer, and will include all materials, equipment, and labor to construct the fills or embankments as illustrated on the construction drawings. Unless otherwise specified, Backfilling of excavations will not be compensated as Fill. Payment will include all clearing and grubbing, preparation, acquisition, transporting, storing, and handling of material, placement, shaping, compaction, and other activities necessary to comply with these Specifications.

Add: When explicitly excluded as a pay item, Fill will be measured by the cubic yard in place as illustrated on the approved plans, or as approved by the Project Officer, and will include all materials, equipment, and labor to construct the fills or embankments as illustrated on the construction drawings. Unless otherwise specified, Backfilling of excavations will not be compensated as Fill. Payment will include all clearing and grubbing, preparation, acquisition, transporting, storing, and handling of material, placement, shaping, compaction, and other activities necessary to comply with these Specifications.
Specifications. Payment will be made at the Select Borrow unit price provided on the Bid Form (Pricing Sheet).

30. Testing

Delete: Testing will be considered subsidiary to the Work and no compensation will be approved. If the Project Officer directs testing in excess of that required by the Contract Documents, the Contractor shall be entitled to compensation unless such testing reveals noncompliant work.

Add: Materials testing shall be in compliance with County Specification Section 01400, and the Special Conditions of this Contract.
This Section shall conform to the Arlington County Construction Standards and Specifications of Section 02600 except as modified herein.

2.2 Base Course

Delete: The base course shall be bituminous concrete consisting of course and fine aggregate combined with asphalt cement, resulting in a mixture of Type BM-2 in conformance with Section 211 of the VDOT Specifications.

Add: 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

Delete: 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-2A in conformance with Section 211 of VDOT Specifications.

Add: 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.

2.5 Traffic Marking

Delete: Traffic marking will be provided by the County.

Add: Traffic marking will be provided by the Contractor.

2.6 Imprinting of Hot Mix Asphalt Concrete

Add: Imprinting operations shall begin immediately after hot asphalt has been placed and compacted to final density, while the asphalt is in a warm to hot pliable state or immediately after heating the asphalt. The Contractor shall follow the latest StreetPrint application procedures. Patterning shall be achieved using steel rollers and/or vibratory plate compactors and shall be of consistent depth. A European herringbone pattern shall be used, unless otherwise specified by the COTR. The cost of purchasing the pattern shall be borne by the Contractor. The Contractor shall receive approval for the pattern design from the
COTR before performing any work. This work shall include imprinting new projects. Payment shall be made on the total square feet of imprint installed. Heating of the asphalt, if required, shall be covered as a separate pay item.

2.7 Heating Asphalt:

Add: Heating asphalt shall consist of using a reciprocating infrared heater specifically designed for heating asphalt safely. Asphalt shall be heated to a minimum depth of one inch (1") at a temperature not to exceed three hundred twenty-five degrees Fahrenheit (325ºF). Heating asphalt is used for installing StreetPrint and DuraTherm. Payment shall be made on the total square feet of asphalt heated.

2.8 Provide and Install StreetBond coating

Add: StreetBond coatings shall be applied within five (5) days after imprinting the asphalt. The Contractor shall apply the "StreetBond Surfacing System" to the imprinted asphalt. The air temperature shall be at least fifty degrees Fahrenheit (50ºF) prior to installation and be increasing through the application process in order to apply the StreetBond Surfacing System. There shall be no precipitation within twenty-four (24) hours after applying the coating. If precipitation occurs during the following twenty-four (24) hours and there is damage to the Streetbond coating, the Streetbond coating shall be reapplied at no additional expense to the City. Installation shall be in accordance with the latest StreetBond application procedures. The StreetBond products shall be spray applied and broomed to ensure that all voids in the pavement are coated. The Contractor shall apply a minimum of two (2) applications of StreetBond CemBase top coated with two (2) applications of StreetBond 150 coating. The entire surface shall be coated uniformly including the vertical edges of the imprinted surfaces. Sufficient masking shall be used to ensure that the surfacing products are applied only where specified. This work shall include the coating of new projects and the coating of existing imprinted surfaces where the old coating needs to be re-coated. Payment will be made on the total square feet of surface coated with four (4) coats of material, which shall include two (2) coats of CemBase and two (2) coats of StreetBond.

2.9 Imprinted Asphalt Patching:

Add: Imprinted asphalt patching shall include removing and replacing the requisite old asphalt and imprinting a new asphalt patch. The edges of the patch shall be feathered into the existing asphalt, providing a seamless surface between the patch and the surrounding asphalt. The imprinting shall be done so that the pattern in the patch matches the existing pattern on the surrounding asphalt. Payment will be made on the total square feet of asphalt patched.
This Section shall conform to the Arlington County Construction Standards and Specifications of Section 02800 except as modified herein.

PART 2 - MATERIALS

Add: NOTES FOR STREET TREE PLANTINGS:

1. Backfill soil mixture shall be ¾ existing soil cleaned of debris (gravel, rocks, sticks, trash, etc.) and mixed with ¼ 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.

2. 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 consists of a sandy loam with uniform composition and is free of stones, lumps, plants, roots, and other debris over ½” in length.
   (B) Topsoil has a PH 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 container.
SECTION 02801              SEEDING AND SODDING

This Section shall conform to the Arlington County Construction Standards and Specifications of Section 02801 except as modified herein.

PART 4 - MEASUREMENT AND PAYMENT

Delete: Seeding and sodding shall be measured in square yards. Payment shall include all labor, materials, and equipment including topsoil, fertilizers, seed or sod, mulch, jute or other synthetic matting and staples necessary to protect against erosion and required for a satisfactory growth of grass or sod.

Add:  Seeding and sodding shall be measured in square yards. Payment shall include all labor, materials, and equipment including fertilizers, seed or sod, jute or other synthetic matting and staples necessary to protect against erosion and required for a satisfactory growth of grass or sod.

Add:  Topsoil shall be measured in cubic yards. Payment shall include all labor, materials, and equipment including topsoil.

Add:  Mulch shall be measured in cubic yards. Payment shall include all labor, materials, and equipment including mulch.
PART 1 – GENERAL

1.1 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

3.1 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 will 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.

3.2 Provision For Temporary Markings
If the Contractor will 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 will 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.

3.3 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.
3.4 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.

3.5 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.

3.6 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.

3.7 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 will be able to repeat the pattern and superimpose additional striping upon the existing marking.

3.8 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.

3.9 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 will 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.

3.10 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.
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 drive 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.

### 3.11 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.

### 3.12 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.

### 3.13 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.

3.14 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 will not be permitted.

3.15 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.

3.16 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 Pavement Line Marking
Measurement of pavement line markings (type, class, width) shall be per linear foot of line furnished and installed.

No additional measurement will 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 will be made for the unmarked area when the marking includes a broken line such as, skip lane line.
4.4 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.
1. **General Description:** Colorized bike lane coating materials are pigmented waterborne coatings that combine color-fast acrylic resins and epoxy modification to provide long lasting, color stable roadway markings. Colorized coatings feature anti-slip properties designed to add friction for pedestrians and bicyclists without creating trip hazards. It has adhesion and flexibility properties that will not crack, peel or flake off the substrate. Colorized coatings are chemical resistant and are impervious to gas, oil and de-icing agents. Colorized coatings are recommended for long lane, no to low traffic delineation areas for preferential use, such as bike lane, bus lane, medians, no stopping areas and pedestrian zones.

2. **Materials:** Colorized coatings shall be composed of:
   2.1. Coatings: A two component, epoxy-modified, acrylic, waterborne coating formulated to have a balance of properties that will ensure adhesion and movement on a flexible pavement, while providing excellent durability, color stability and friction properties.

tabular:

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASTM D2369 % Solids by weight</td>
<td>&gt; 76%</td>
</tr>
<tr>
<td>ASTM D26297 % Solids by volume</td>
<td>&gt; 55.5%</td>
</tr>
<tr>
<td>Weight per gallon</td>
<td>13.9 lbs/gal</td>
</tr>
<tr>
<td>% non-reactive fillers</td>
<td>&lt; 40%</td>
</tr>
<tr>
<td>Boiling Range</td>
<td>147° - 477°F</td>
</tr>
<tr>
<td>Vapor Density</td>
<td>Heavier than air</td>
</tr>
<tr>
<td>Flashpoint ASTM D 3278</td>
<td>&gt; 201°F</td>
</tr>
<tr>
<td>Hazardous Ingredients</td>
<td>none</td>
</tr>
</tbody>
</table>

2.2. Colorant: A concentrated, UV stable pigment blend designed to add the desired color to the coating. The coloring system shall consist of no less than 95% pure inorganic iron oxide pigments in a water-based liquid carrier. Pigment particle size (fineness) must pass 95% minus 325 mesh. Colorant must be alkali-resistant, water-insoluble, inert, light-resistant, inorganic, and lime-proof.

2.3. Material must be designed for application onto asphalt pavement surfaces but can be applied to non-bituminous concrete surfaces, such as Portland cement concrete, with use of a concrete primer.

2.4. Material shall be applied in 4 thin layers, allowing each layer to dry to the touch in between, to provide a total dry build thickness of 20-25 mils (0.51-0.635mm).

3. **Application:** Material shall be applied to the pavement surface using the methods outlined in the coating manufacturer’s application instructions.

3.1. Preconditions:
   3.1.1. Surface Prep: The pavement surface shall be completely dry and free from all foreign matter. Concrete surfaces shall require additional surface preparation to remove any laitance from the surface. For concrete installations, a waterborne concrete primer, as recommended by manufacturer, shall be applied according to
application instructions and shall be allowed to dry to the touch before applying coatings. New asphalt surfaces shall be allowed to cool after final compaction roll to less than 140°F before applying coating.

3.1.2. Weather: Optimal installation temperatures are between 70-90°F, with low humidity. Minimum air and substrate must be 50°F and rising, and shall not drop below 50°F within 8 hours of application of the last layer of coating. The temperature of the concrete or asphalt surface must be at least 5°F above the dew point temperature during and after applying coating. Increase in drying and curing times shall be expected at lower temperatures, and during high humidity. No precipitation shall be expected within 2 hours after the last layer of the coating is dry to the touch. Surfaces should be dry for at least 24 hours prior to applying colorized coatings. Coating application must be complete at least two hours before sunset to allow for proper cure.

3.1.3. Obstacles: Pavement markings that are to be left in place, utilities, drainage structures, curbs and any other structure within or adjacent to the treatment location shall be masked to protect from application. Existing pavement markings conflicting with the surface treatment should be removed by grinding or water blasting. Extra care should be taken to thoroughly remove residual dust and grinding debris.

3.2. Mixing: Part B, Colorant and 1 quart +/- 0.5 water shall be added to Part A and mixed thoroughly, creating a vortex, using a high speed high torque drill and paddle for a minimum of 3 minutes.

<table>
<thead>
<tr>
<th>Application</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Mix Ratio (Coating) gal/pints</td>
<td>5 gal : 1 pint</td>
</tr>
<tr>
<td>Dry mil thickness per coat</td>
<td>10 to 15 mils</td>
</tr>
<tr>
<td>Recommended minimum number of coats</td>
<td>3</td>
</tr>
</tbody>
</table>

3.3. Installation:

3.3.1. Initial Layer:

3.3.1.1. Small projects: Distribute initial layer of coatings to the pavement using a soft bristle broom and / or 1” - 1.5” nap roller. Ensure a thin build with even distribution.

3.3.1.2. Large or small projects: Each layer of coating application shall be spray applied using a double diaphragm spray system with an air atomized textured spray gun. Coatings shall be broomed using a soft bristle broom to work the material into the surface.

3.3.2. Additional Layers: The first layer and each additional layer of coating shall be allowed to dry to the touch before applying the next layer. The last layer shall be rolled, or spray and rolled, using a 1” – 1.5” nap roller to provide additional friction.
properties. Environmental factors such as air and substrate temperature, humidity, sun and wind will affect dry times. Conditions that improve ability for moisture to evaporate will have positive effects on dry times.

3.3.3. Coverage: Coating material shall cover approximately 175 sq. ft. (16.3 m²) per mixed pail, using the recommended 4-layer system. While building the coating in layers, there will be less coverage with the first layer and greater coverage with subsequent layers.

3.4. Open to Traffic: Coating material shall be allowed to cure before being exposed to traffic. The longer they are allowed to cure, the better they will perform. Coatings shall be left for a minimum of 12 hours after the last layer is dry to the touch before traffic is introduced.

3.5. Clean up: Tooling and equipment shall be cleaned only with water while coatings are still wet. Remove masking. Dispose of all materials in accordance with all applicable federal, state and local laws and regulations.

4. Performance Properties

4.1. Key properties will include wear and crack resistance, color retention, adhesion, minimal softening from water absorption and anti-slip.

<table>
<thead>
<tr>
<th>Test</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dry Time (to re-coat) @ 50°F (10°C)</td>
<td>120 min</td>
</tr>
<tr>
<td>Dry Time (to re-coat) @ 90°F (32°C)</td>
<td>30 min</td>
</tr>
<tr>
<td>85% Cure (to permit Bike Lane) @ 50°F (10°C)</td>
<td>8 to 10 hours</td>
</tr>
<tr>
<td>85% Cure (to permit Traffic) @ 90°F (32°C)</td>
<td>4 to 6 hours</td>
</tr>
<tr>
<td>Gloss: ASTM D523 (60° Gardner)</td>
<td>2.5</td>
</tr>
<tr>
<td>Hardness: ASTM D3363</td>
<td>3H pencil</td>
</tr>
<tr>
<td>ASTM 2486 Gasoline Scrub Resistance To 50% of coating thickness (30 mils.)</td>
<td>&gt;5000 cycles to max loss of 50% coating thickness</td>
</tr>
<tr>
<td>ASTM 2486 Motor Oil Scrub Resistance To 50% of coating thickness (30 mils)</td>
<td>&gt;5000 cycles to max loss of 50% coating thickness</td>
</tr>
<tr>
<td>Temp. limits for service (of cured material) - 35°F to 145°F</td>
<td>-35°F to 145°F</td>
</tr>
<tr>
<td>ASTM G-155 Color Stability QUV 2,000 hrs (CIE units)</td>
<td>Old Brick Color</td>
</tr>
<tr>
<td>Pedestrian Friction ASTM E303 British Pendulum</td>
<td>88 BPN Dry</td>
</tr>
<tr>
<td>Mandrel Bend Test ASTM D522</td>
<td>72 BPN Wet</td>
</tr>
<tr>
<td>Water Absorption ASTM D570 7day cure</td>
<td>&lt;9%</td>
</tr>
<tr>
<td>VOC Content ASTM D3960</td>
<td>&lt;19 grams/liter</td>
</tr>
<tr>
<td>Taber Abrasion Dry H-10 ASTM D4060 1day cure</td>
<td>.17g/1000 cycles</td>
</tr>
<tr>
<td>Taber Abrasion Wet H-10 ASTM D4060 7day cure</td>
<td>.43g/1000 cycles</td>
</tr>
</tbody>
</table>
5. Field Quality Control

5.1. The contractor for work under this section shall maintain a quality control program specifically to verify compliance with this specification. A daily log shall be kept to record actions in the field. This log shall include the following information;

- Surface preparation start date and time
- Photos of surface prior to start of preparation
- Ambient temperature start and end of each day
- Relative humidity start and end of each day
- Substrate surface temperature start and end of each day
PART 1 – GENERAL

1.1 Description Of The Work
This work shall consist of furnishing and installing bollards in accordance with the Plans, and these Specifications, at the locations shown in the Plans or as staked by the Engineer.

PART 2 - MATERIALS

2.1 Posts and Hardware
Bollards shall be semi-rigid flexible type model no DK-8 by U.S. Reflector or approved equal.

Bollards shall be a single piece design manufactured with polyurethane and UV inhibitors.

Bollards shall not feature springs or pivoting devices.

Bollards shall be 5.5-inches in diameter and shall have an overall installed height of 31-inches. Color shall be ‘Steel’.

Bollards shall include two white reflective bands at the top.

Bollards shall feature a ring of reflective glass beads at the top and bottom of the post.

The Contractor shall include one anchor driver tool suitable for installation of the bollards.

2.3 Reflective Tape
Reflective tape shall be white and shall be one of the following or an approved equal:

Scotchlite High Intensity Grade Series 2870
Reflexite AP-1000
Scotchlite Diamond Grade LDP Series 3970
T-6500 High Intensity (Type IV)

2.4 Concrete
Footings shall be constructed using concrete Class 3000.

PART 3 – EXECUTION

3.1 Construction Requirements
Bollards shall not vary more than 1/2 inch in 30 inches from a vertical plane.
Bollards shall be installed per the manufacture’s recommendations.

PART 4 – MEASUREMENT AND PAYMENT

Measurement of bollards will be by the unit for each type of bollard furnished and installed.

Payment for bollards shall be per each and shall include all labor, materials, tools, equipment, transportation, supplies, and incidentals required to complete the work as specified. The anchor driver tool shall become property of the County at Contract completion.
SECTION 13130 BUS SHELTERS

This Section shall conform to the Arlington County Construction Standards and Specifications of Section 13130 except as modified herein.

PART 3 – EXECUTION

Revise the first sentence in article 3.2 to read:

The unit is to be mounted on a 6-inch thick concrete pad on a 3-inch compacted aggregate base.

Add article 3.5 as follows:

3.5 Work Adjacent to Bricks Or Pavers
Existing bricks or pavers adjacent to the new pad location shall be cut neatly to match the new edge of the pad.

PART 2 – MATERIALS

Supplement article 2.1 as follows:

2.1 Bus Shelter Unit
Bus shelters shall be Model Eclipse by Brasco International, Inc. or County approved equal. The shelter shall be as shown on the Plans. The shelter shall have bolt down type footings. The Contractor shall submit shop drawings for approval by the County prior to fabrication.

2.2 Benches for Bus Shelters
See Section 13140 for bus shelter bench requirements.

For 5’ x 12’ shelters install one (1) six foot bench.
For 5’ x 12’ Cantilever Roof shelters install one (1) six foot bench.
For 5’ x 16’ shelters install two (2) six foot benches.
For 5’ x 18’ shelters install two (2) six foot benches.

Benches shall be installed at the inside edge of the shelter such that a minimum 3’ x 3’ area is available for ADA access.

2.3 LED Light Fixtures for Bus Shelters
See Section 13150 for bus shelter lighting requirements. Shelters shall be fabricated at the factory to accept light fixture mounting hardware.
PART 4 – MEASUREMENT AND PAYMENT

Revise article 4 to read as follows:

4.1 Bus Shelters
Measurement of bus shelters shall be per each shelter, installed and accepted by the Engineer.

Payment for bus shelter installation shall be per each and shall include all labor, materials, tools, equipment, transportation, supplies, and incidentals required to complete the work as specified. No separate or additional payment will be made for leveling materials or anchor bolts.

4.2 Bus Shelter Pad
Measurement of bus shelter pads shall be per square yard of actual pad installed.

Payment for bus shelter pads shall be by the square yard and shall include all labor, materials, tools, equipment, transportation, supplies, and incidentals required to complete the work as specified. Payment for excavation and base material will be made under the applicable items contained in the Proposal. No additional or separate payment will be made for cutting of bricks or pavers as necessary to install the shelter pad.
SECTION 13140  SITE FURNISHINGS

PART 1 – GENERAL

1.1 Description Of The Work
Provide all labor, materials, tools, equipment, transportation, supplies, and incidentals to furnish and install site furnishings as specified herein.

This work also includes providing all labor, materials, tools, equipment, transportation, supplies, and incidentals to remove, protect, and reinstall existing bicycle racks as shown on the plans and specified herein.

1.2 Related Work Specified Elsewhere
Section 09900 – Protective Coatings

1.3 Submittals
Submit detail drawing of product including overall dimensions and options.

1.3 Warranty
Site furnishings shall include a standard manufacturer warranty.

PART 2 - MATERIALS

2.1 Media Vending Machines
Media vending machine shall be by Sho-Rack, Kaspar Wire Works of Shiner, Texas, or County approved equal.

The display shall consist of an overall 72-inch wide base tray model no. MB-3 supported by two 19-inch height pedestals, model no. MP-2. The vending units shall be stacked with three (3) double door components along the bottom, model no. K-49-16. The top row shall consist of two (2) non-coin vending units, model no. K-97 and one (1) $3.00 coin wheel unit, model no. TK-97.

The entire unit shall be powder coated Zurich silver finish.

Ground anchors shall be per the manufacture’s recommendation and shall be stainless steel.

2.3 Trash Receptacles
Trash receptacle shall be Model S-42, Ironsites Series by Victor Stanley, Inc. or County approved equal. Trash receptacles shall have a silver metallic finish.

2.5 Benches for Shelters
Benches shall be Ratio Bench, by Forms + Surfaces or County approved equal. Bench frames shall be polyester powder coated aluminum texture. Bench seats shall be uncoated stainless steel. Benches shall be backless without armrests but shall include two equally spaced divider Benches shall be surface mounted. The Contractor shall furnish stainless steel anchor hardware.

PART 3 – EXECUCTION

3.1 Removal and Storage
Existing bicycle racks to be relocated shall be carefully removed to prevent damage. Bicycle racks shall be relocated to a temporary location that is not impacted by construction activities.

3.2 Installation
Parking meter pay stations shall be set plumb at locations indicated on the plans or as directed by the Engineer.

PART 4 – MEASUREMENT AND PAYMENT

4.1 Miscellaneous Site Furniture
Measurement of site furniture items shall be per each item furnished and installed.

Payment for site furniture shall be per each and shall include all labor, materials, tools, equipment, transportation, supplies, and incidentals required to furnish and install the items as specified.

4.2 Bicycle Racks
Measurement of bicycle rack relocations shall be per each rack relocated including temporary storage.

Payment for bicycle rack relocations shall be per each and shall include all labor, materials, tools, equipment, transportation, supplies, and incidentals required to relocate the rack as specified including foundations and new hardware.
SECTION 13150                         COMMUNICATION, ELECTRICAL AND LIGHTING

PART 1 – GENERAL

1.1 Description Of The Work
Provide all labor, materials, tools, equipment, transportation, supplies, and incidentals to furnish and install conduit and junction boxes for lighting, electrical and future communication services to bus stop sites as specified herein.

1.2 Related Work Specified Elsewhere
Arlington County Traffic Signal and Streetlight Specifications

PART 2 - MATERIALS

2.1 Conduit
Conduit for electrical and communication service shall meet the requirements of Section 4.02 of the Arlington County Traffic Signal and Streetlight Specifications and shall be installed for future use as specified.

2.2 Pull Boxes
Pull Boxes for electrical and communication service shall meet the requirements of Section 4.03 of the Arlington County Traffic Signal and Streetlight Specifications. Pull boxes for electrical service shall be in accordance with Drawing No. TS4-6 of the Arlington County Traffic Signal and Streetlight Specifications. The casting lid shall be marked TRANSIT ELEC.

Pull boxes for communication service shall be in accordance with Drawing No. TS4-4 of the Arlington County Traffic Signal and Streetlight Specifications. The lid shall be marked TRANSIT COM. The box shall be open bottom 12-3/4” dimension.

2.3 Cables
Cables for electrical and service shall meet the requirements of Section 5.01 and 7.14 of the Arlington County Traffic Signal and Streetlight Specifications.

2.4 LED Light Fixture for Bus Shelter
LED light fixtures for bus shelters shall be 20 Watt LED Brasco model no. #EA048 or County approved equal. Light fixtures shall include mounting hardware.

PART 3 – EXECUTION

3.1 Conduit Termination at Bus Shelters
Conduits for communication service shall be terminated with a sweep at the inside rear corner of the shelter. Conduit shall protrude no more than 3-inches above finished grade. The Contractor shall determine the location of the sweep such that it corresponds to the correct location of final shelter placement.

3.2 **Electrical Conduit Termination at Meter Base**
Conduits for electrical service shall be terminated at the meter base shown on the plans. The conduit shall be connected to the outside base of the meter as necessary to provide future service from an additional breaker to be installed in the future.

3.2 **Communication Conduit Termination at Signal Controller**
Conduits for communication service shall be terminated within one foot of the traffic signal controller. No sweep is required.

**PART 4 – MEASUREMENT AND PAYMENT**

4.1 **Conduit and Pull Boxes**
Measurement and payment of conduit and pull boxes shall be in accordance with Section 4.02 and 4.03 of the Arlington County Traffic Signal and Streetlight Specifications.

4.2 **Electrical Cable**
Measurement and payment of electrical cable shall be in accordance with Section 7.14 of the Arlington County Traffic Signal and Streetlight Specifications.

4.3 **Electrical Service**
Measurement and payment of electrical service shall be in accordance with Section 7.15 of the Arlington County Traffic Signal and Streetlight Specifications.

4.3 **LED Light Fixtures for Bus Shelters**
Measurement and payment of LED light fixtures for bus shelters shall be per each fixture furnished and installed as specified including mounting hardware and connections.
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.
THIS AGREEMENT is made, on the date of execution by the County, between
[Corporation, General Partnership, Limited Liability Company, etc.] authorized to do business in the Commonwealth of Virginia, and the County Board of Arlington County, Virginia (County). The County and the Contractor, for the consideration hereinafter specified, agree as follows:

1. CONTRACT DOCUMENTS
The Contract Documents consist of:

- Agreement No. 652-14, and all modifications properly incorporated into the Agreement
- Exhibit A - NOT USED
- Exhibit B - Arlington County Invitation to Bid No. 652-14, including General Conditions, Special Conditions, and Supplementary Specifications
- Exhibit C - The Arlington County Department of Environmental Services’ Standards and Specifications, Current Edition
- Exhibit D - Unit price bid of the 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 shall prevail over the other Contract Documents.

Exhibits A, B, and C are considered complementary documents, what is in one shall be considered as in all; where the terms of these Contract Documents vary the most stringent shall apply; and Exhibits A, B, and C shall prevail over Exhibit D.

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 of them has made any representation or promise with respect to the parties’ Agreement which is not contained in the Contract Documents. The Contract Documents may be referred to herein as the “Contract” or “Agreement.”

2. PROJECT OFFICER
The performance of the Contractor is subject to the general control, review and approval of the County Project Officer, who shall be appointed by the
Director of the Arlington County Department of Environmental Services or designee. The Contractor shall not comply with requests and/or orders issued by other than the Project Officer of designee. However, it shall be the responsibility of the Contractor to manage the details of the execution and performance of its Work under this Agreement. Where the term "Engineer" is used in the Contract Documents, it shall be interpreted to mean "Project Officer".

3. SCOPE OF WORK
The Contractor will furnish all labor, materials, and equipment for the construction of larger scale public works infrastructure and street improvement projects including construction, reconstruction, and maintenance of: State and County streets, curbs & gutters, sidewalks, walkways, driveway aprons, storm sewer pipes and inlets, pavement markings and signage, electrical conduits, traffic controls, streetscapes, and related site work (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 obligation of the Contractor to obtain clarification from the Project Officer concerning any questions about or conflicts in the specifications, drawings and construction notes in a timely way so as not to delay the progress of the Work. The Contract Documents set forth the minimum Work estimated by the County and the Contractor to be necessary to complete the Work. 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.

4. CONTRACT TERM
The term of this Agreement will commence on the date of execution by the County, and shall be completed no later than March 31st, 2018, subject to any written modifications as provided for in the Contract Documents. Upon satisfactory performance by the Contractor, the County may, through issuance of a Notice of Award, authorize continued operations of the Contractor for not more than two (2) additional twelve (12) month periods.

5. CONTRACT AMOUNT
The Contract unit price(s) shall remain firm for twelve (12) months from the date of execution by the County (“Price Adjustment Date”). To request a price adjustment, the Contractor or the County must submit a written request to the other party not less than sixty (60) days prior to the Price Adjustment Date. Requests for adjustment(s) to unit price(s) shall not exceed the percentage of escalation / de-escalation in the Engineering News Record (ENR) Construction Cost Index (CCI), 20-city average, ending in October of each year of the Contract.

If the Contractor and the County do not agree on the requested adjustment using the procedure set forth above, by the thirtieth (30th) calendar day prior to the Price Adjustment Date, the County may in its sole discretion terminate the Contract. The contract unit price(s) that changed as a result of this procedure shall become effective the day after the Price Adjustment Date and shall be binding on both parties for 12 months following the adjustment which shall be considered the new Price Adjustment Date.
6. **PAYMENT TERMS**

Payment terms will be recorded by the County as net thirty (30) days. The County will pay the Contractor within thirty (30) days after the date of receipt of a correct (as determined by the Project Officer) invoice approved by the Project Officer describing completed work which is reasonable and allocable to the Contract, or the date of receipt of the entire order, or the date of acceptance of the work which meets the Contract requirements, whichever is later. Payments will be made by the County for goods or services furnished, delivered, inspected, and accepted upon receipt of invoices submitted on the date of shipment or delivery of service, subject to applicable payment terms. The number of the Purchase Order pursuant to which authority shipments have been made or services performed shall appear on all invoices. Invoices shall be submitted in duplicate. Unless otherwise specified by the Contract Documents, payment shall not be made prior to delivery and acceptance of the entire order by the County.

7. **PAYMENT OF SUBCONTRACTORS**

The Contractor is obligated to take one of the two following actions within seven (7) calendar days after receipt of amounts paid to the Contractor 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 (7) calendar 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 shall accrue at the rate of one percent (1%) per month.

The Contractor shall 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 as those contained herein 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.

8. **RELEASE AND REQUEST FOR FINAL PAYMENT**

Upon completion of the Project and before Final Acceptance, the Contractor will submit to the Project Officer a signed copy of the Arlington County Release and Request for Final Payment form per the General Conditions.

9. **LIQUIDATED DAMAGES**

The County specifies that time is of the essence under this Contract. Time being of the essence, it is essential to the County that Contract work be
completed within the Contract Term. The County and the Contractor agree that damages for failure to complete the work within the Contract Term are not susceptible to exact determination but that $580 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 on demand $580 per day for each and every calendar day that the Contractor has not obtained Final Completion beyond the Contract Term as damages caused by such delay and not as a penalty. The County shall 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 to the validity of any liquidated damages stated in this Agreement as they may appear on grounds that such liquidated damages are void as penalties or are not reasonably related to actual damages.

10. NON-APPROPRIATION
All Funds for 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. In the event of non-appropriation of funds by the County Board of Arlington County, Virginia for the services provided under this Contract or substitutes for such services which are as advanced or more advanced in their technology, the County will terminate the Contract, without termination charge or other liability to the County, on the last day of the then-current fiscal year or when the appropriation made for the then-current year for the services covered by this Contract is spent, whichever event occurs first. If funds are not appropriated at any time for the continuation of this Contract, cancellation will be accepted by the Contractor on thirty (30) days prior written notice, but failure to give such notice shall be of no effect and the County shall not be obligated under this Contract beyond the date of termination specified in the County’s written notice.

11. ESTIMATED QUANTITIES/ NON-EXCLUSIVITY OF CONTRACTOR
During the Contract Term, the Contractor will furnish all of the goods or services described in the Contract Documents, if so requested by the County. The County will have no obligation to the Contractor if no, or fewer, items or services are required or requested by the County. Any quantities which are included in the Contract Documents are the present expectations of those who are planning for the County for the period of the Contract. The amount is only an estimate and the Contractor understands and agrees that the County is under no obligation to the Contractor to buy that amount, or any amount as a result of having provided this estimate or of having had any normal or otherwise measurable requirement in the past. The Contractor further understands that the County may require goods and/or services in excess of the estimated annual contract amount and that such excess shall not give rise to any claim for compensation other than at the unit prices and/or rates set forth in this Contract. Further, the items or services covered by this contract may be available or become available under other County contracts, and in analyzing its needs, the County may determines that it is in its best interest to procure the items or services through such another contract. Therefore, the County does not guarantee that the Contractor will be the exclusive provider of the goods or services covered by this contract.

12. COUNTY PURCHASE ORDER REQUIREMENT
County purchases are authorized only if a County Purchase Order is issued in advance of the transaction, indicating that the ordering agency has sufficient funds available to pay for the purchase. Such a Purchase Order is
to be provided to the Contractor by the ordering agency. The County will not be liable for payment for any purchases made by its employees without appropriate purchase authorization issued by the County Purchasing Agent. If the Contractor provides services without a signed County Purchase Order, it does so at its own risk and expense.

13. **LIEN**
It is expressly agreed that after any payment has been made by the County either to the Contractor or to any subcontractor, laborer, or any other person 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 any subcontractor, 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 this Contract, the Contractor agrees as follows:

a. The Contractor will not discriminate against any employee or applicant for employment because of race, religion, color, sex, national origin, age, disability, or any other basis prohibited by federal or Virginia law related to discrimination in employment except where there is a bona fide occupational qualification reasonably necessary or related to the normal operation of the Contractor. 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. The Contractor, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, will state that the Contractor is an Equal Opportunity Employer.

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

d. The Contractor will comply with the provisions of the Americans with Disabilities Act of 1990 which prohibits discrimination against individuals with disabilities in employment, and mandates their full participation in both publicly and privately-provided services and activities.

e. The Contractor will include the provisions of the foregoing paragraphs in every subcontract or purchase order of over $10,000.00, so that these provisions will apply to each subcontractor or vendor.

15. **EMPLOYMENT OF UNAUTHORIZED ALIENS PROHIBITED**
In accordance with § 2.2-4311.1 of the Code of Virginia, 1950, as amended, the Contractor acknowledges that it does not, and shall not during the performance of this Contract, knowingly employ an unauthorized alien as that term 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 agrees to (i) provide a drug-free workplace for the Contractor’s employees; (ii) post in conspicuous places, available to employees and applicants for employment, a
statement notifying employees that the unlawful manufacture, sale, distribution, dispensation, possession, or use of marijuana or any other controlled substance is prohibited in the Contractor's workplace, and specifying the actions that will be taken against employees for violations of such prohibition; (iii) state in all solicitations or advertisements for employees placed by or on behalf of the Contractor that the Contractor maintains a drug-free workplace; and (iv) include the provisions of the foregoing clauses in every subcontract or purchase order of over $10,000.00 relating to this Contract, so that the provisions will be binding upon each subcontractor or vendor.

For the purposes of this section, "drug-free workplace" means a site for the performance of work done in connection with a specific contract awarded to a contractor by Arlington County, the employees of whom are prohibited from engaging in the unlawful manufacture, sale, distribution, dispensation, possession or use of any controlled substance or marijuana during the performance of the contract.

17. PROJECT STAFF
The County will, throughout the Contract Term and any renewal 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 must 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 shall be solely the responsibility of the Contractor.

18. FAILURE TO DELIVER
In case of failure to deliver goods or services in accordance with the Contract terms and conditions, the County, after due oral or written notice, may procure the goods or services from other sources and hold the Contractor responsible for any resulting additional purchase and administrative costs; provided, that if public necessity requires the use of materials or supplies not conforming to the specifications, they may be accepted and payment therefore shall be made at a reduction in price to be determined solely by the County. This remedy shall be in addition to any other remedies, which the County may have. The County shall be entitled to offset such costs against any sums owed by the County to the Contractor.

19. UNSATISFACTORY WORK
If any of the work done, or material, goods, or equipment provided, by the Contractor is unsatisfactory to the County, the Contractor shall, on being notified by 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. In the event the Contractor fails within fifteen (15) calendar days after receipt of written notice to remove improper or unsuitable work, material, goods, or equipment and replace it with suitable and satisfactory work, material, goods, or equipment, the County shall have the right, but not the obligation, to remove or replace the rejected work, material, goods, or equipment at the expense of the Contractor. This paragraph applies during the Contract term and during any warranty or guarantee period. At its discretion, the County shall be entitled to offset such expense against any sums owed by the County to the Contractor under this Contract. If the Project Officer and the County deem it expedient not to require correction or replacement of the work which has not been done in accordance with the Contract, an appropriate adjustment to the Contract Amount may be made therefor.
20. **TERMINATION FOR CAUSE, INCLUDING BREACH AND DEFAULT; CURE**

The County shall have the right to terminate this Contract prior to the end of the Contract Term if the Contractor is in breach or default or has failed to perform satisfactorily the Work required, as determined by the County in its discretion.

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 such failure(s) at least fifteen (15) calendar days before termination of the Contract takes effect (“Cure Period”). If the Contractor fails to cure within the Cure Period or as otherwise specified in the notice, the Contract may be terminated for the Contractor’s failure to provide satisfactory Contract performance. Upon such termination, the Contractor may apply for compensation for Contract services satisfactorily performed by the Contractor and allocable to the Contract and accepted by the County prior to such termination unless otherwise barred by the Contract ("Termination Costs"). In order to be considered, such request for Termination Costs, with all supporting documentation, must be submitted to the County Project Officer within fifteen (15) calendar days after the expiration of the Cure Period. The County may accept or reject, in whole or in part, the application for Termination Costs and notify the Contractor of same within a reasonable time thereafter.

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

Upon any termination pursuant to this section, the Contractor shall be liable to the County for all costs incurred by the County after the effective date of termination, including costs required to be expended by the County to complete the Work covered by the Contract, including costs of delay in completing the Work or the cost of repairing or correcting any unsatisfactory or non-compliant work performed or provided by the Contractor or its subcontractors. Such costs shall be either deducted from any amount due the Contractor or shall be promptly paid by the Contractor to the County upon demand by the County. Additionally, and notwithstanding any provision in this Contract to the contrary, the Contractor is liable to the County, and the County shall be entitled to recover, all damages to which the County is entitled by this Contract or by law, including and without limitation, direct damages, indirect damages, consequential damages, delay damages, replacement costs, refund of all sums paid by the County to the Contractor under the Contract and all attorney fees and costs incurred by the County to enforce any provision of this Contract.

Except as otherwise directed by the County in the notice, the Contractor shall stop work on the date of receipt of notice of the termination or other date specified in the notice, place no further orders or subcontracts for materials, services, or facilities except as are necessary for the completion of such portion of the Work not terminated, and terminate all vendors and subcontracts and settle all outstanding liabilities and claims. Any purchases after the date of termination contained in the notice shall be the sole responsibility of the contractor.
In the event any termination for cause, default, or breach shall be found to be improper or invalid by any court of competent jurisdiction then such termination shall be deemed to have been a termination for convenience.

21. **TERMINATION FOR THE CONVENIENCE OF THE COUNTY**
The performance of Work under this Contract may be terminated by the County Purchasing Agent in whole or in part whenever the Purchasing Agent shall determine that such termination is in the County’s best interest. Any such termination shall be effected by the delivery to the Contractor of a written notice of termination at least fifteen (15) calendar days before the date of termination, specifying the extent to which performance of the work under this Contract is terminated and the date upon which such termination becomes effective. The Contractor will be entitled to receive compensation for all Contract services satisfactorily performed by the Contractor and allocable to the Contract and accepted by the County prior to such termination and any other reasonable termination costs as negotiated by the parties, but no amount shall be allowed for anticipatory profits.

After receipt of a notice of termination and except as otherwise directed, the Contractor shall stop all designated work on the date of receipt of the notice of termination or other date specified in the notice; place no further orders or subcontracts for materials, services or facilities except as are necessary for the completion of such portion of the work not terminated; immediately transfer all documentation and paperwork for terminated work to the County; and terminate all vendors and subcontracts and settle all outstanding liabilities and claims.

22. **INDEMNIFICATION**
The Contractor covenants for itself, its employees, and 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” for purposes of this section) from and against any and all claims made by third parties or by the County for any and all losses, damages, injuries, fines, penalties, costs (including court costs and attorney’s fees), charges, liability, demands or exposure, however caused, 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 and/or subcontractors, in performance or nonperformance of the work called for by the Contract Documents. This duty to save, defend, hold harmless and indemnify shall survive the termination of this Contract. If, after notice by the County, the Contractor fails or refuses to fulfill its obligations contained in this section, the Contractor shall be liable for and reimburse the County for any and all expenses, including but not limited to, reasonable attorneys’ fees incurred and any settlements or payments made. The Contractor shall pay such expenses upon demand by the county and failure to do so may result in such amounts being withheld from any amounts due to Contractor under this Contract.

23. **INTELLECTUAL PROPERTY INDEMNIFICATION**
The Contractor warrants and guarantees that no intellectual property rights (including, but not limited to, copyright, patent, mask work and trademark) of third parties are infringed or in any manner involved in or related to the services provided hereunder.

The Contractor further covenants for itself, its employees, and subcontractors to save, defend, hold harmless, and indemnify the County, and
all of its officers, officials, departments, agencies, agents, and employees from and against any and all claims, losses, damages, injuries, fines, penalties, costs (including court costs and attorney’s fees), charges, liability, or exposure, however caused, for or on account of any trademark, copyright, patented or unpatented invention, process, or article manufactured or used in the performance of this Contract, including its use by the County. If the Contractor, or any of its employees or subcontractors, uses any design, device, or materials covered by letters patent or copyright, it is mutually agreed and understood, without exception, that the Contract Amount includes all royalties, licensing fees, and any other costs arising from the use of such design, device, work, or materials in any way involved with the work hereunder. This duty to save, defend, hold harmless and indemnify shall survive the termination of this Contract. If, after Notice by the County, the Contractor fails or refuses to fulfill its obligations contained in this section, the Contractor shall be liable for and reimburse the County for any and all expenses, including but not limited to, reasonable attorneys’ fees incurred and any settlements or payments made. The Contractor shall pay such expenses upon demand by the county and failure to do so may result in such amounts being withheld from any amounts due to Contractor under this Contract.

24. COPYRIGHT
The Contractor hereby irrevocably transfers, assigns, sets over and conveys to the County all right, title and interest, including the sole exclusive and complete copyright interest, in any and all copyrightable works created pursuant to this Contract. The Contractor further agrees to execute such documents as the County may request to effect such transfer or assignment.

Further, the Contractor agrees that the rights granted to the County by this paragraph are irrevocable. Notwithstanding anything else in this Contract, the Contractor's remedy in the event of termination of or dispute over the terms of this Contract shall not include any right to rescind, terminate or otherwise revoke or invalidate in any way the rights conferred pursuant to the provisions of this paragraph. Similarly, no termination of this Contract shall have the effect of rescinding, terminating or otherwise invalidating the rights acquired pursuant to the provisions of this "Copyright" paragraph.

The use of subcontractors or third parties in developing or creating input into any copyrightable materials produced as a part of this Contract is prohibited unless the County approves the use of such subcontractors or third parties in advance and such subcontractors or third parties agree to include the provisions of this paragraph as part of any contract they enter into with the Contractor for work related to work pursuant to this Contract.

25. OWNERSHIP AND RETURN OF RECORDS
This Contract confers no ownership rights to the Contractor nor any rights or interests to use or to disclose the County’s data or inputs.

The Contractor agrees that all drawings, specifications, blueprints, data, information, findings, memoranda, correspondence, documents or records of any type, whether written or oral or electronic, and all documents generated by the Contractor or its subcontractors as a result of the County's request for services under this Contract, are the exclusive property of the County ("Record" or "Records"), and all such Records shall be provided to and/or returned to County upon completion, termination, or cancellation of this Contract. The Contractor shall not use, willingly allow, or cause such materials to be used for any other purpose other than performance of all
obligations under the Contract without the written consent of the County. Additionally, the Contractor agrees that the Records are confidential records and neither the Records nor their contents shall be released by the Contractor, its subcontractors, or other third parties; nor shall their contents be disclosed to any person other than the Project Officer or his or her designee. The Contractor agrees that all oral or written inquiries from any person or entity regarding the status of any Record generated as a result of the existence of this Contract shall be referred to the Project Officer or his or her designee for response. At the County's request, the Contractor shall deliver all Records to the Project Officer, including "hard copies" of computer records, and at the County's request, shall destroy all computer records created as a result of the County's request for services pursuant to this Contract.

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

No termination of this Contract shall have the effect of rescinding, terminating or otherwise invalidating this section.

26. **CONFIDENTIAL INFORMATION**
The Contractor, and its employees, agents, and subcontractors, hereby agree to hold as confidential all County information obtained as a result of its Work under this Contract. Confidential information includes, but is not limited to, nonpublic personal information, personally identifiable health information, social security numbers, addresses, dates of birth, other contact information or medical information about a person, information pertaining to products, operations, systems, customers, prospective customers, techniques, intentions, processes, plans, expertise and any information entrusted to any affiliate of the parties. The Contractor shall 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 any Virginia or federal law related to ethics, conflicts of interest, or bribery, including, by way of illustration and not limitation, the Virginia 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 offer was made without collusion or fraud and 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 employee of the County shall be admitted to any share in any part of this Contract or to any benefit that may arise therefrom which is not available to the general public.

29. **FORCE MAJEURE**

ITB No. 562-14
The Contractor shall not be held responsible for failure to perform the duties and responsibilities imposed by this Contract if such failure is due to fires, riots, rebellions, natural disasters, wars, or an act of God beyond the control of the Contractor and outside the scope of the Contractor’s then-current, by industry standards, disaster plan that make performance impossible or illegal, unless otherwise specified in the Contract.

The County shall not be held responsible for failure to perform its duties and responsibilities imposed by the Contract if such failure is due to fires, riots, rebellions, natural disasters, wars, or an act of God beyond the control of the County that make performance impossible or illegal, unless otherwise specified in the Contract.

30. **AUTHORITY TO TRANSACT BUSINESS**
The Contractor shall, pursuant to Code of Virginia §§ 2.2-4311.2, be and remain authorized to transact business in the Commonwealth of Virginia during the Initial Term and any Subsequent Contract Term(s) of this Contract. A contract entered into by a Contractor in violation of this requirement is voidable, without cost or expense, at the sole option of the County.

31. **RELATION TO THE COUNTY**
The Contractor is an independent contractor, and neither the Contractor nor its employees or subcontractors will, under any circumstances, be considered employees, servants or agents of the County. The County will not be legally responsible for any negligence or other wrongdoing by the Contractor, its employees, servants or agents. The County will not withhold from payments to the Contractor any federal or state unemployment taxes, federal or state income taxes, Social Security tax, or any other amounts for benefits to the Contractor or its employees, servants or agents. Furthermore, the County will not provide to the Contractor any insurance coverage or other benefits, including workers' compensation, normally provided by the County for its employees.

32. **ANTITRUST**
By entering into this Contract, the Contractor conveys, sells, assigns and transfers to the County all rights, title, and interest in and to all causes of action the Contractor may now have or hereafter acquire under the antitrust laws of the United States or the Commonwealth of Virginia, relating to the services purchased or acquired by the County under this Contract.

33. **REPORT STANDARDS**
Reports or written material prepared by the Contractor in response to the requirements of this Contract or a request of the Project Officer shall, unless otherwise provided for in the Contract, meet standards of professional writing established for the type of report or written material provided, shall be thoroughly researched for accuracy of content, shall be grammatically correct and not contain spelling errors, shall be submitted in a format approved in advance by the Project Officer, and shall be submitted for advance review and comment by the Project Officer. The cost of correcting grammatical errors, correcting report data, or other revisions required to bring the report or written material into compliance with these requirements shall be borne by the Contractor.

When submitting documents to the County, the Contractor shall comply with the following guidelines:
• All submittals and copies shall be printed on at least thirty percent (30%) recycled-content and/or tree-free paper;
• All copies shall be double-sided;
• Report covers or binders shall be recyclable, made from recycled materials, and/or easily removable to allow for recycling of report pages (reports with glued bindings that meet all other requirements are acceptable);
• The use of plastic covers or dividers should be avoided; and
• Unnecessary attachments or documents not specifically asked for should not be submitted, and superfluous use of paper (e.g. separate title sheets or chapter dividers) should be avoided.

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

35. AMENDMENTS
Unless otherwise specified herein, this Contract shall not be amended except by written amendment executed by persons duly authorized to bind the Contractor and the County.

36. ARLINGTON COUNTY PURCHASING RESOLUTION AND COUNTY POLICIES
Notwithstanding any provision to the contrary herein, no provision of the Arlington County Purchasing Resolution or any applicable County policy is waived in whole or in part.

37. DISPUTE RESOLUTION
All disputes arising under this Agreement, or its interpretation, whether involving law or fact, extra work or extra compensation or time, and all claims for alleged breach of Contract shall be submitted in writing to the Project Officer for decision at the time of the occurrence or beginning of the work upon which the claim is based, whichever occurs first. Any such claims shall state the facts surrounding it in sufficient detail to identify it together with its character and scope. 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 sixty (60) days after final payment. The time limit for final written decision by the County Manager in the event of a contractual dispute, as that term is defined in the Arlington County Purchasing Resolution, is thirty (30) days. Procedures for considering contractual claims, disputes, administrative appeals, and protests are contained in the Purchasing Resolution, which is incorporated herein by reference, and available upon request from the Office of the Purchasing Agent. The Contractor shall not cause a delay in the Work pending any decision of the Project Officer, County Manager, County Board, or a court of law.

38. APPLICABLE LAW, FORUM, VENUE, AND JURISDICTION
This Contract and the work performed hereunder shall be governed in all respects by the laws of the Commonwealth of Virginia, and the jurisdiction, forum, and venue for any litigation with respect hereto shall be in the Circuit Court for Arlington County, Virginia, and in no other court. In performing its work under this Contract, the Contractor shall comply with applicable federal, state, and local laws, ordinances and regulations.

39. ARBITRATION
It is expressly agreed that nothing under the Contract shall be subject to arbitration, and that any references to arbitration are expressly deleted from the Contract.

40. NONEXCLUSIVITY OF REMEDIES
All remedies available to the County under this Contract are cumulative, and no such remedy shall be exclusive of any other remedy available to the County at law or in equity.

41. NO WAIVER
The failure of either party to exercise in any respect a right provided for in this Contract shall not be deemed to be a subsequent waiver of the same right or any other right.

42. SEVERABILITY
The sections, paragraphs, sentences, clauses and phrases of this Contract are severable, and if any phrase, clause, sentence, paragraph or section of this Contract shall be declared invalid by a court of competent jurisdiction, such invalidity shall not affect any of the remaining phrases, clauses, sentences, paragraphs and sections of this Contract.

43. NO WAIVER OF SOVEREIGN IMMUNITY
Notwithstanding any other provision of this Contract, nothing in this Contract or any action taken by the County pursuant to this Contract shall constitute or be construed as a waiver of either the sovereign or governmental immunity of the County. The parties intend for this provision to be read as broadly as possible.

44. SURVIVAL OF TERMS
In addition to any numbered section in this Agreement which specifically state that the term or paragraph survives the expiration of termination of this Contract, the following sections if included in this Contract also survive: INDEMNIFICATION; RELATION TO THE COUNTY; OWNERSHIP AND RETURN OF RECORDS; AUDIT; COPYRIGHT; INTELLECTUAL PROPERTY INDEMNIFICATION; WARRANTY; CONFIDENTIAL INFORMATION.

45. HEADINGS
The section headings in this Contract are inserted only for convenience and are not to be construed as part of this Contract or a limitation on the scope of the particular section to which the heading precedes.

46. AMBIGUITIES
Each party and its counsel have participated fully in the review and revision of this Agreement. Any rule of construction to the effect that ambiguities are to be resolved against the drafting party shall not apply in interpreting this Agreement. The language in this Agreement shall be interpreted as to its fair meaning and not strictly for or against any party.

47. NOTICES
Unless otherwise provided herein, all notices and other communications required by this Contract shall be deemed to have been given when made in writing and either (a) delivered in person, (b) delivered by an agent, such as an overnight or similar delivery service, or (c) deposited in the United States mail, postage prepaid, certified or registered, addressed as follows:

TO THE CONTRACTOR: REFER TO BID FORM OF CONTRACTOR
TO THE COUNTY:

The County Project Officer (refer to section headed Project Officer) under the Contract Terms and Conditions

AND

Richard D. Warren, Jr., Purchasing Agent
Arlington County, Virginia
2100 Clarendon Boulevard, Suite 500
Arlington, Virginia 22201

48. NON-DISCRIMINATION NOTICE
Arlington County does not discriminate against faith-based organizations.

49. INSURANCE, PAYMENT AND PERFORMANCE BONDS
The Contractor shall maintain the required insurance coverage and payment and performance bonds through completion of the Contract, including all warranty and guarantee periods.

WITNESS these signatures:

THE COUNTY BOARD OF ARLINGTON COUNTY, VIRGINIA

AUTHORIZED SIGNATURE: ____________________  AUTHORIZED SIGNATURE: ____________________

NAME AND TITLE: RICHARD D. WARREN, JR. PURCHASING AGENT

DATE: ___________________________  DATE: ___________________________
V. ARLINGTON COUNTY DES ENGINEERING PROJECT  
GENERAL CONDITIONS  

A. INTRODUCTION TO TERMS  

1. DEFINITIONS  

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

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

c. 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.  

d. The term “Change Order” means a written order to Contractor, signed by the County and the Contractor, which authorizes a change in the Work, or an adjustment in the Contract Amount, and/or the Contract Term issued after execution of the Agreement.  

e. The term “Commencement Date” means the date on which the Contract Term will commence for the Contractor to begin to perform his obligations under the Contract Documents as provided in the Notice to Proceed.  

f. The term “Contract Documents” means the Agreement and all the documents and Exhibits identified therein which shall include the Drawings and the Specifications and all modifications thereto properly incorporated in the Contract  

(1) The term “Agreement” means the completed and signed form of Contract agreement.  

(2) The term “Contract Drawings” means all drawings and construction notes which show the locations, character, dimensions, and details of the Work pertaining to the Contract.  

(3) The term “Specifications” means and shall include the Supplementary Specifications, the Special Conditions, the Technical Specifications, and all written agreements and instructions pertaining to the performance of the Work.  

(a) The term “Technical Specifications” means the applicable technical specifications contained in the current edition of the Arlington County Department of Environmental Services, Standards and Specifications.
(b) The term “Supplementary Specifications” means any specifications included in the Contract Documents which modify, nullify, or add to the Technical Specifications for requirements or conditions peculiar to this contract.

(c) The term "Special Conditions" means the written statements modifying or supplementing the General Conditions for requirements or conditions peculiar to the Contract.

g. 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.

h. The term "Engineer" means the Director, Department of Environmental Services, Arlington County, or designee. The designee may be identified as either the County’s appointed Project Officer or a contractor employed by the County to perform construction services or project oversight.

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

j. 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 County determines whether Final Completion has been accomplished after its representatives conduct a final walkthrough inspection of the project to verify the condition after notification by the Contractor. The date of the Final Completion of the Work under the Contract is the date on which Final Completion is accomplished.

k. “Notice to Proceed” shall mean a written notice given by the County to the Contractor specifying the Commencement Date.

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

m. 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.
n. 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.

o. The term "Subcontractor", as employed herein, 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.

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

q. "Written notice" shall be deemed to have been duly served if a) delivered in person to the individual or to the member of the firm or to an officer of the corporation for whom it is intended, or b) delivered to an agent, such as overnight or similar delivery service, or c) deposited in the United States mail, postage prepaid, certified or registered addressed to the last known address of such other party.

B. DRAWINGS, SPECIFICATIONS AND RELATED DATA

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 other instructions deemed necessary by the Project Officer will be furnished to the Contractor when required for the Work and shall become incorporated into the Contract Documents.
c. 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.

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

e. Materials or work described in words which, so applied, have a well-known technical 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 shall be as binding as if called for by all. Figured dimensions on the plans shall be used in preference to scaling the Drawings. In case of conflict between small and large scale drawings, the large scale drawings shall govern.

2. DISCREPANCIES AND ERRORS

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 report them in writing to the Project officer. If the Contractor proceeds with any work that may be affected by such discrepancies, errors, or omissions, after their discovery, but before their clarification, such work shall be at the Contractor's sole risk and expense and such work may not be the basis of any Claim for Extra Cost.

3. DIFFERING SITE CONDITIONS

The Contractor shall, within twenty-four hours after becoming aware of differing site conditions, and before the conditions are disturbed, give a written 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.

The Project Officer will investigate the site conditions within two (2) business days 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.

5. DOCUMENTS ON THE JOB SITE

The Contractor shall keep on the site of the project a copy of the Drawings, Specifications, Permits, and all other applicable documents including all authorized revisions, and shall at all times give the County and its authorized representatives access thereto.

6. 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. Upon completion of the project, all copies of the Drawings and Specifications except the signed Contract sets shall be returned to the Project Officer.

7. SUBMITTALS

Submittals shall be processed per the Specifications unless otherwise specified.

8. TESTS

Any specified laboratory tests of materials and finished articles shall be made by bureaus, laboratories or agencies approved by the Project Officer and the certified reports of such tests shall be submitted to the Project Officer. All costs in connection with the testing shall be borne by the Contractor. Failure of any material to pass the specified tests or any test performed by the Project Officer, 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 for testing. Samples failing to meet the Contract requirements will automatically void previous approvals of the items tested.

9. SURVEYS AND CONTROLS

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.

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10. **AS-BUILT DRAWINGS**

As-built drawings shall be the responsibility of the Contractor. The Contractor shall maintain and mark up one (1) set of prints of the applicable Contract drawings to portray as-built construction. The prints shall be neatly and clearly marked 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 as-built construction. These drawings shall be submitted with every payment request. At the completion of the Project and prior to request for Final Payment, the Contractor shall turn over to the Project Officer a complete set of As-Built drawings.

C. **COUNTY, PROJECT OFFICER, AND CONTRACTOR RELATIONS**

1. **STATUS OF PROJECT OFFICER**

The Project Officer shall be the County's representative during the construction period. The Project Officer shall have authority to suspend the Work whenever such suspension may be necessary in the responsible opinion of the Project Officer. The Project Officer 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.

2. **PROJECT OFFICER'S DECISIONS**

The Project Officer will, within a reasonable time, make decisions on all matters relating to the execution and progress of the Work.

3. **LIMITATION ON COUNTY’S RESPONSIBILITIES**

Except as modified by the Contract Documents, 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.

4. **DISPUTES**

   a. All disputes arising under this Contract or its interpretation, whether involving law or fact or both, for extra work, and all claims for alleged breach of Contract shall be submitted in writing to the Project Officer for decision prior to beginning the work on which the claim is based. 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. In any case where the Contractor deems extra compensation is due him for work or materials clearly not covered in the Contract, or not ordered by the Project Officer as additional work not specifically included in the Contract Documents, the Contractor shall notify the Project Officer in writing of the Contractor's intention to make claim for such extra compensation before the Contractor begins the work on which the Contractor bases the claim. If such notification is not given, or the Project Officer is not afforded proper facilities by the Contractor for keeping strict account of actual cost, then the Contractor hereby agrees to waive the claim for such extra compensation.

c. Contractual disputes 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.

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

5. INSPECTION OF WORK

The Engineer 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 Engineer'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 limit or relieve the Contractor's independent duty to inspect the Work.

6. INSPECTION OF MATERIALS

All articles, materials, and supplies purchased by the Contractor for the Work are subject to inspection by the Project Officer 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 the materials.

7. EXAMINATION OF COMPLETED WORK

If the Engineer 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, restoration, and/or replacing shall be at the Contractor's expense.

8. 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. The Contractor may be entitled to an extension of the Contract Term or an increase in the Contract Amount subject to the terms of the Contract Documents. 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.

9. SUPERINTENDENCE BY CONTRACTOR

The Contractor shall keep a competent superintendent and any necessary assistants on the Work at all times during its progress and such persons shall be satisfactory to the Engineer. The superintendent shall not be changed except on the Engineer's determination the superintendent is no longer satisfactory or except with the consent of the Engineer where the superintendent proves to be unsatisfactory to the Contractor and ceases to be in the Contractor's employment. The superintendent shall represent the Contractor in the Contractor's absence and all directions given to him shall be as binding as if given to the Contractor. In general, instructions by the Engineer shall be confirmed in writing, and always upon written request from 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.

10. LANDS BY COUNTY

The County shall provide 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 of the lands, rights-of-way or easements have not been obtained as herein contemplated before construction begins, the Contractor shall begin its work on such lands and rights-of-way as the County may have previously acquired.

11. LANDS BY CONTRACTOR

If the Contractor requires additional land 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, 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 written permission.

12. **SEPARATE CONTRACTS**

   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 the opportunity for the delivery and 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 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 contractors engaged in adjacent work as to the rights of each under the Contract Documents, the Project Officer shall determine the rights of each party.

13. **SUBCONTRACTS**

   a. 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 him.

   b. 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 documents comprising the Contract insofar as such documents are applicable to the work of subcontractors.

   c. 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, or see to the payment of any sums to any subcontractor.

14. **ELIMINATED ITEMS**

The Project Officer may, upon written notice to the Contractor, eliminate 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 for the installation of such item(s) 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. If the County notifies the Contractor of such elimination at least fifteen (15) calendar days prior to scheduled installation of such item(s), then no additional compensation will be made for overhead or anticipated profit.

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 workmanship shall be accomplished by persons qualified in the respective trades.

2. **IBC 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 (USBC); 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), and any other applicable regulations and standards.

The Contractor is not required to ascertain whether the Contract Documents meet ADA design standards and guidelines, or other applicable regulations and standards. 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.

Neither the Arlington County Inspection Services Division, nor any County staff and/or their third party inspection services, are responsible for inspecting the Work to ensure it is completed in accordance with Contract Documents, the ADA, or other applicable requirements.

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 approved by the Engineer, 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. The Contractor shall provide all manufacturer’s warranties to the Project Officer by the date of Final Completion. Such defects shall be corrected by the Contractor at no expense to the County.

All work is guaranteed by the Contractor against defects resulting from the use of inferior or faulty materials, or inferior or faulty workmanship, or work not in accordance with the requirements of the Contract Documents for one (1) year from the date of Final Acceptance of the work by the County in addition to and irrespective of any manufacturer’s or supplier’s warranty. No date other than the date of Final Acceptance shall govern the effective date of the Guaranty, 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 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, ACCEPTANCE AND TITLE OF MATERIALS

Inspection and acceptance by the County will be at the work site in Arlington County, Virginia and within five (5) business days of delivery unless otherwise provided for in the Contract. The County will not inspect, accept, or pay for any materials stored off-site by the Contractor. Title and risk of loss or damage to
all items shall be the responsibility of the Contractor until Final Acceptance by the County. 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 advisable to assure that goods or services conform to the specification. 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.

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.

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. CUTTING, PATCHING, AND DIGGING

The Contractor shall do all cutting, fitting, or patching 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 may direct. The Contractor shall not endanger any work by cutting, digging, or otherwise, and shall not cut or alter the work of any other contract except with the consent of the Project Officer.

10. REJECTED WORK AND MATERIALS

a. All materials which do not conform to the requirements of the Contract Documents, are not equal to samples approved by the Project Officer, or are in any way unsatisfactory or
unsuited to the purpose for which they are intended, shall be rejected. 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 no cost to the County. The fact that the Project Officer 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, 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 Term and during any warranty or guarantee period.

c. If the Project Officer and County deem 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 therefor.

11. OSHA REQUIREMENTS

The Contractor certifies that all material supplied or used under this Contract meets all Occupational Safety and Health Administration (O.S.H.A.) requirements, both Federal and those of the Commonwealth of Virginia; 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 federal occupational safety and health requirements, all costs necessary to bring the material into compliance with the requirements shall be borne by the Contractor.

12. 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 Material Safety Data Sheets ("MSDS") required under the Standard for all hazardous materials supplied to the County or used in the performance of the work. Such MSDS 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 MSDS 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 MSDS 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.

13. 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. 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.

14. 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 will not proceed without an Asbestos-Related Work Authorization executed by the County Asbestos Program Manager.

15. 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. 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 also shall reimburse to the County all costs of such goods, equipment, supplies or materials installed. If the Contractor fails to remove and legally dispose of the asbestos-containing goods, equipment or construction materials within ninety (90) days from the date of notice by the County, the County shall remove and dispose of the asbestos-containing goods, equipment or construction materials at the Contractor's expense. The County shall be entitled to offset such expenses against any sums owed by the Contractor to the County under this Contract.

E. LEGAL RESPONSIBILITY AND PUBLIC SAFETY

1. MAINTENANCE OF TRAFFIC

The Contractor shall conduct its operations in a manner that will ensure that all modes of traffic will be uninterrupted except as approved by the County. 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 will be restored and the hazard to traffic reduced to the minimum. 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, the area shall be barricaded and warning signs shall be posted. Approved safety barriers may be required.

At all times the Contractor shall use the personnel and traffic control signs and devices necessary to comply with Part VI of the "National Manual on Uniform Traffic Control Devices." During the progress of the work when the street may be obstructed to any extent by construction equipment or construction operations, in addition to the signs and barricades, special workers, equipped with VDOT required "STOP\SLOW" double sided traffic control paddles, shall be designated by the Contractor to direct traffic. These workers so designated shall not be assigned to any other duties while engaged in directing traffic. 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. No separate payment shall be made by the County for Maintenance of Traffic, unless otherwise specified.
2. **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 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 person on the worksite and who is, by training or experience, familiar with 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, at the County's request, a copy of the Contractor's written safety policies and safety procedures applicable to the scope of work. Failure to provide this information within seven (7) calendar days of the County's request 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 "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.
3. OVERHEAD HIGH VOLTAGE LINES SAFETY ACT

If any work required herein will be performed within ten (10) 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. 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.

4. 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 the local and State departments of health and where additional accommodations are necessary to maintain a reasonably sanitary environment, then such additional accommodations shall be made as determined by the Project Officer.

5. DAMAGES CAUSED BY WORK

Any damage resulting from work performed under this Contract shall be repaired to the County's satisfaction at the Contractor's expense.

F. PROGRESS AND COMPLETION OF THE WORK

1. NOTICE TO PROCEED

Within thirty (30) calendar days of the Award Date, 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 the Commencement Date and shall be prosecuted regularly, diligently, and uninterruptedly at a rate of progress that will ensure full completion thereof in the shortest length of time consistent with good workmanship.

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 Project Officer will review the schedule to verify compliance with the Contract requirements, and when accepted, such schedules shall govern 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.

4. 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 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.

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.
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**: If required by this Contract, the Contractor shall provide to the Project Officer a Schedule of Values for each Lump Sum item in the Contract, and the application for payment will reflect the schedule of values and the amount of work completed in those units.

Otherwise, the application for payment shall reflect the percentage of work completed for each lump sum item.

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.

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.

2. **PAYMENT FOR MATERIALS ON SITE**

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.

3. **STIPULATED PRICE ITEMS**

Work on 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.

4. **PAYMENTS WITHHELD**

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

5. **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 Contract Sum being adjusted accordingly if applicable. All such work shall be executed under the conditions
of the original Contract, except that any claim for modification of the Contract Term caused thereby may be adjusted at the time of ordering such change.

The Project Officer 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 order from the County signed by the Project Officer and no claim for an addition to the Contract Sum shall be valid unless so ordered.

a. **Unit Price Items**: The County expressly reserves the right, except as may be otherwise specifically limited, to increase or decrease quantities of work for which the Contractor provided a unit price in the bid form as the County deems necessary or desirable to complete the Work covered in this Contract. Increases in such quantities shall be performed by the Contractor at the cost provided in the bid form.

b. **Other Work**: Any change in work which is not covered by Unit Prices in the bid form shall be determined in one or more of the following ways: (a) by estimate and acceptance by the County in a lump sum; (b) by cost and fixed fee; or (c) by any other method permitted under the Arlington County Purchasing Resolution.

c. If none of the aforementioned methods is agreed upon the Contractor shall proceed with the work provided the Contractor receives an order as above per the conditions outlined under Force Account Work below.

6. **FORCE ACCOUNT WORK**

A Force Account may be used at the County's discretion and only when 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 (ii) 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 i, ii, iii, and iv 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 Engineer 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

ITB No. 562-14
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.

<table>
<thead>
<tr>
<th>Total Cost of Subcontract Work:</th>
<th>Rate Schedule</th>
</tr>
</thead>
<tbody>
<tr>
<td>$0 - $10,000</td>
<td>10%</td>
</tr>
<tr>
<td>&gt; $10,000</td>
<td>$1,000 + 5% above $10,000</td>
</tr>
</tbody>
</table>

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.

7. CLAIMS FOR EXTRA COST

If the Contractor claims that any instructions by the Project Officer, by drawings or otherwise, will incur the Contractor extra cost under this Contract, then, except in emergencies endangering life or property, the Contractor shall give written notice thereof before proceeding to execute the work. Said notice shall be given promptly enough to avoid delaying the work and in no instance later than ten (10) calendar days after the receipt of such instruction. The Contractor’s notice must provide to the Project Officer the amount of additional compensation claimed, together with the basis therefor and documentation supporting the claimed amount. No such claim shall be valid unless so made. If the Project Officer agrees that such instructions involve extra cost to the Contractor, any additional compensation will determined by one of the methods provided in “Changes in Work” above. The Contractor may not present as Extra Cost any claims which relate to any erroneous, contradictory or incomplete or infeasible requirements or directions in the Contract Documents that Contractor discovered during the bidding process but failed to report to the County, unless such erroneous, contradictory or incomplete or infeasible requirements or directions could only be ascertained upon commencement of the Work.

8. EXTENSIONS OF CONTRACT TERM AND CLAIMS FOR DAMAGES – CONDITIONS OTHER THAN WEATHER

The Contractor's relief for any claim for delay, other than Force Majeure, and which is caused by entities or conditions fully outside the control of the Contractor, subcontractors, Suppliers, and any other persons or firms associated in any with the Contractor, shall be an extension of the Contract Term and/or the Contractor's direct costs which result from the delay.

If the Contractor is entitled to compensation for delay as described above and where there is no change in the Work, the Contractor will be entitled to actual costs incurred as provided in “Force Account Work” above.

No extension of the Contract Term will be granted for any delay unless the Contractor demonstrates the claimed delay directly impacts the critical path of the Work, and any float has been consumed.

The Contractor shall not be entitled to any Contract adjustments (Term or Cost) unless the Contractor notifies the County of the delay and the cause of such delay in writing within two (2) business days of the onset of the delay. The Contractor’s complete submittal for a time extension and any claimed damages shall be submitted no later than thirty (30) calendar days after cessation of the delay or within such longer period as the County may agree in writing to allow. The Contractor’s full submittal to the County shall specify the nature of the delay claimed by
the Contractor, the cause of the delay, the impact of the delay on the Contractor’s Work schedule, and all supporting documentation.

The Contractor's sole relief on any claims for delay which is caused by Force Majeure shall be an extension of the Contract Term provided the Contractor gave the Project Officer timely written notice at the inception of such delay.

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).

9. EXTENSIONS OF CONTRACT TERM – WEATHER DELAYS

The Contract Term will not be extended due to inclement weather conditions which are normal, as defined below, for Arlington County. The Contract Term 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 Contract Term 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 Contractor must provide notice of delay to the Project Officer no later than five (5) calendar days after the onset of the delay which satisfies the criteria listed above. A fully documented claim for a time extension under this section shall be submitted no later than thirty (30) calendar days after the cessation of the delay. It shall be the Contractor’s responsibility solely to provide the necessary documentation to satisfy the Project Officer that the Weather Condition(s) claimed were encountered.

The Project Officer will determine the Contractor’s entitlement to an extension of the Contract Term. 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 Contract Term 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 Contract Term 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 Contract Term 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**

<table>
<thead>
<tr>
<th>Month</th>
<th>Avg days with precipitation of 0.1” or more</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan</td>
<td>7</td>
</tr>
<tr>
<td>Feb</td>
<td>6</td>
</tr>
<tr>
<td>Mar</td>
<td>7</td>
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<td>Apr</td>
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<td>May</td>
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<td>Jun</td>
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<td>Sep</td>
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<td>Oct</td>
<td>5</td>
</tr>
<tr>
<td>Nov</td>
<td>6</td>
</tr>
<tr>
<td>Dec</td>
<td>6</td>
</tr>
</tbody>
</table>

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 claimed under Weather Condition #1 above.

10. RELEASE OF LIENS

The County, before making any payment including Final Payment, shall require the Contractor to furnish a complete release of all liens arising out of this Contract, or receipts in full in lieu thereof, and if required in either case, an affidavit that so far as the Contractor has knowledge or information, the releases and receipts include all the labor and material for which a lien could be filed. 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.

11. FINAL PAYMENT

After the Contractor has completed all work and corrections to the satisfaction of the Project Officer 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 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 __________________
VI. 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 Term 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 Term 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 Term, 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.

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.

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 amendment 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.

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.
VII. ATTACHMENTS AND FORMS
ARLINGTON COUNTY, VIRGINIA
OFFICE OF THE PURCHASING AGENT

INVITATION TO BID NO. 562-14

BID FORM

SUBMIT TWO (2) FULLY-COMPLETED AND SIGNED BID FORMS TO THE OFFICE OF THE BID CLERK, SUITE 511, 2100 CLARENDON BLVD., ARLINGTON, VIRGINIA 22201 (ONE FORM SHALL CONTAIN AN ORIGINAL LONGHAND SIGNATURE; THE OTHER SHALL BE A PHOTOCOPY OF THE SIGNED ORIGINAL)

BIDS WILL BE OPENED AT 2:00 P.M., Thursday, March 5th, 2015

FOR PROVIDING CAPITAL IMPROVEMENT PROJECT WORK TO CONSIST GENERALLY OF LARGER SCALE PUBLIC WORKS INFRASTRUCTURE AND STREET IMPROVEMENT PROJECTS INCLUDING CONSTRUCTION, RECONSTRUCTION, AND MAINTENANCE OF: STATE AND COUNTY STREETS, CURBS & GUTTERS, SIDEWALKS, WALKWAYS, DRIVEWAY APRONS, STORM SEWER PIPES AND INLETS, PAVEMENT MARKINGS & SIGNAGE, ELECTRICAL CONDUITS, TRAFFIC CONTROLS, STREETSCAPES, AND RELATED SITE WORK IN ACCORDANCE WITH THE DRAWINGS, SPECIFICATIONS, TERMS AND CONDITIONS OF THIS SOLICITATION

THE UNDERSIGNED UNDERSTANDS AND ACKNOWLEDGES THE FOLLOWING:


EACH BIDDER IS RESPONSIBLE FOR DETERMINING THE ACCURACY AND COMPLETENESS OF ALL SOLICITATION DOCUMENTS THEY RECEIVE, INCLUDING DOCUMENTS OBTAINED FROM THE COUNTY AND DOCUMENTS OBTAINED FROM ALL OTHER SOURCES.

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. 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 at the following prices: (All prices include provision and installation).

The undersigned acknowledges receipt of the following amendments:

AMENDMENT NO. 1  DATE:____________  INITIAL:____________
AMENDMENT NO. 2  DATE:____________  INITIAL:____________
AMENDMENT NO. 3  DATE:____________  INITIAL:____________

BIDDER NAME: ____________________________________________

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ITB No. 562-14
FURNISHING ALL LABOR, MATERIALS AND EQUIPMENT FOR THE CAPITAL IMPROVEMENT PROJECT WORK TO CONSIST GENERALLY OF LARGER SCALE PUBLIC WORKS INFRASTRUCTURE AND STREET IMPROVEMENT PROJECTS INCLUDING CONSTRUCTION, RECONSTRUCTION, AND MAINTENANCE OF: STATE AND COUNTY STREETS, CURBS & GUTTERS, SIDEWALKS, WALKWAYS, DRIVEWAY APRONS, STORM SEWER PIPES AND INLETS, PAVEMENT MARKINGS & SIGNAGE, ELECTRICAL CONDUITS, TRAFFIC CONTROLS, STREETSCAPES, AND RELATED SITE WORK IN ARLINGTON, VIRGINIA

PLEASE COMPLETE THE PRICING SHEET PROVIDED WITH THE BID DOCUMENTS AS ATTACHMENT A TO ITB NO. 562-14 AND SUBMIT IT WITH YOUR BID.

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

LIQUIDATED DAMAGES:

FINAL COMPLETION: $580 PER CALENDAR DAY

MINIMUM QUALIFICATION REQUIREMENTS:

1. Does the Bidder have at least five (5) continuous years of conducting public works infrastructure and street improvement projects of similar size and scope, construction, re-construction, and maintenance?

_____ YES _____ NO

Provide a summary of the last three (3) years of past performance history. For six (6) of the projects within that timeframe, provide all of the information below and current reference contact information for Bidder qualification verification:

- Project name and location,
- Project owner,
- Name, phone number, email to the owner’s Project Officer,
- Project start date, the anticipated project completion date, the actual project completion date and if applicable, reason(s) for variances,
- Initial project budget, final project cost and if applicable, reason(s) for cost variances,
- Project scope,
- Number of instances of damage to underground utilities, dates of occurrence(s), name of operator and foreman at the time of utility damage, name of utility,
- Similarities between the referenced project and scope of work of this solicitation

Failure to qualify according to the foregoing requirements will result in bid rejection by the Arlington County Purchasing Office.

BIDDER NAME: ____________________________
THE UNDERSIGNED (INITIAL ONE ENTRY) ELECTS____, DOES NOT ELECT____, TO USE THE ESCROW PROCEDURES DESCRIBED IN SECTION 11-56.1 OF THE VIRGINIA PUBLIC PROCUREMENT ACT.

TRADE SECRETS OR PROPRIETARY INFORMATION:
Trade secrets or proprietary information submitted by a bidder in connection with a procurement transaction shall not be subject to public disclosure under the Virginia Freedom of Information Act. However, Section 4-111 of the Arlington County Purchasing Resolution states that the bidder must invoke the protection of this section prior to or upon submission of the data or other materials, and must identify the data or other materials to be protected and state the reasons why protection is necessary.

Please mark one:

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

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

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

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

State the specific reason(s) why protection is necessary:
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

If you fail to identify the data or other materials to be protected and state the reasons why protection is necessary in the space provided above, you will not have invoked the protection of Section 4-111 of the Purchasing Resolution. Accordingly, effective upon the award of 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, any act of collusion with another person (under Virginia Code Section 59.1-68.6 et seq.), engaged in the same line of business or commerce; or any act of fraud punishable under Article 1.1 of the Virginia Governmental Frauds Act (Va. Code §18.2-498.1 et seq.).

BIDDER NAME: ____________________________

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ITB No. 562-14
CERTIFICATION OF UNDERSTANDING OF THE CONTRACT DOCUMENTS: The undersigned affirms that he has carefully examined all of the Solicitation Documents and that there are no erroneous, contradictory, incomplete or infeasible requirements or directions apparent in the Bid. The undersigned agrees to waive any claims in any way associated with any such erroneous, contradictory, incomplete or infeasible requirements or directions unless such requirements could only reasonably be uncovered during the course of the Work.

CONTACT PERSON AND MAILING ADDRESS FOR DELIVERY OF NOTICES
Provide the name and address of the person designated by the Bidder to receive notices and other communications (Refer to section headed Notices in the Contract Terms and Conditions of this solicitation for further details):

NAME: ___________________________________________________________
ADDRESS: ___________________________________________________________
E-MAIL: ___________________________________________________________

THE PROPER LEGAL NAME OF THE FIRM OR ENTITY SUBMITTING THIS BID MUST BE WRITTEN IN THE SPACE PROVIDED BELOW. THIS BID FORM, AND ALL OTHER DOCUMENTS REQUIRED BY THE INVITATION TO BID TO BE SUBMITTED WITH THIS BID FORM, INCLUDING, BUT NOT LIMITED TO ALL ISSUED AMENDMENTS, MUST BE FULLY AND ACCURATELY COMPLETED AND SIGNED BELOW BY A PERSON AUTHORIZED TO LEGALLY BIND THE BIDDER, OR THE BID MAY BE REJECTED:

AUTHORIZED SIGNATURE ____________________________________________

PRINT NAME AND TITLE ____________________________________________

INDICATE THE NAME AND CONTACT INFORMATION OF THE PERSON WHO CAN RESPOND AUTHORITATIVELY TO ANY QUESTIONS REGARDING THIS BID (I.E. PROJECT MANAGER):

NAME (PRINTED): ___________________________ TEL. NO.: ___________________________
E-MAIL ADDRESS: ___________________________ FAX. NO.: ___________________________
<table>
<thead>
<tr>
<th>BID FORM, PAGE 5 OF 5</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SUBMITTED BY:</strong> (LEGAL NAME OF FIRM)</td>
</tr>
<tr>
<td><strong>ADDRESS:</strong></td>
</tr>
<tr>
<td><strong>CITY/STATE/ZIP:</strong></td>
</tr>
<tr>
<td><strong>TELEPHONE NO:</strong></td>
</tr>
<tr>
<td><strong>VA. CONTRACTOR LICENSE #:</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>THIS FIRM IS A:</th>
<th>• INSERT NAME OF STATE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>____ CORPORATION, ____ GENERAL PARTNERSHIP, ____ LIMITED PARTNERSHIP,</td>
</tr>
<tr>
<td></td>
<td>____ UNINCORPORATED ASSOCIATION, ____ LIMITED LIABILITY COMPANY,</td>
</tr>
<tr>
<td></td>
<td>____ SOLE PROPRIETORSHIP</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>IS FIRM AUTHORIZED TO TRANSACT BUSINESS IN THE COMMONWEALTH OF VA?</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>IDENTIFICATION NO. ISSUED TO THE FIRM BY THE SCC:</th>
</tr>
</thead>
</table>

| ANY BIDDER EXEMPT FROM SCC AUTHORIZATION REQUIREMENT SHALL INCLUDE A |
| STATEMENT WITH ITS BID WHY THEY ARE NOT REQUIRED TO BE SO AUTHORIZED |

<p>| IS YOUR FIRM CURRENTLY DEBARRED FROM SUBMITTING BIDS TO ARLINGTON |</p>
<table>
<thead>
<tr>
<th>COUNTY, VIRGINIA, OR ANY OTHER STATE OR POLITICAL SUBDIVISION?</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>BIDDER STATUS:</th>
<th>MINORITY OWNED:</th>
<th>WOMAN OWNED:</th>
<th>NEITHER:</th>
</tr>
</thead>
</table>
# INSURANCE CHECKLIST

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

<table>
<thead>
<tr>
<th>Coverages Required</th>
<th>Coverage Minimum(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Workers' Compensation</td>
<td>Statutory limits of Virginia</td>
</tr>
<tr>
<td>2. Employer's Liability</td>
<td>$100,000 accident, $100,000 disease, $500,000 disease policy limit</td>
</tr>
<tr>
<td>3. Commercial General Liability</td>
<td>$1,000,000 CSL BI/PD each occurrence, $2 Million annual aggregate</td>
</tr>
<tr>
<td>4. Premises/Operations</td>
<td>$500,000 CSL BI/PD each occurrence, $1 Million annual aggregate</td>
</tr>
<tr>
<td>5. Automobile Liability</td>
<td>$1 Million BI/PD each accident, Uninsured Motorist</td>
</tr>
<tr>
<td>6. Owned/Hired/Non-Owned Vehicles</td>
<td>$1 Million BI/PD each accident, Uninsured Motorist</td>
</tr>
<tr>
<td>7. Independent Contractors</td>
<td>$500,000 CSL BI/PD each occurrence, $1 Million annual aggregate</td>
</tr>
<tr>
<td>8. Products Liability</td>
<td>$500,000 CSL BI/PD each occurrence, $1 Million annual aggregate</td>
</tr>
<tr>
<td>9. Completed Operations</td>
<td>$500,000 CSL BI/PD each occurrence, $1 Million annual aggregate</td>
</tr>
<tr>
<td>10. Contractual Liability (Must be shown on Certificate)</td>
<td>$500,000 CSL BI/PD each occurrence, $1 Million annual aggregate</td>
</tr>
<tr>
<td>11. Personal and Advertising Injury Liability</td>
<td>$1 Million each offense, $1 Million annual aggregate</td>
</tr>
<tr>
<td>12. Umbrella Liability</td>
<td>$1 Million Bodily Injury, Property Damage and Personal Injury</td>
</tr>
<tr>
<td>13. Per Project Aggregate</td>
<td></td>
</tr>
<tr>
<td>14. Professional Liability</td>
<td></td>
</tr>
<tr>
<td>15. Miscellaneous E&amp;O</td>
<td></td>
</tr>
<tr>
<td>16. Motor Carrier Act End. (MCS-90)</td>
<td>$1 Million BI/PD each accident, Uninsured Motorist</td>
</tr>
<tr>
<td>17. Motor Cargo Insurance</td>
<td></td>
</tr>
<tr>
<td>18. Garage Liability</td>
<td>$1 Million Bodily Injury, Property Damage per occurrence</td>
</tr>
<tr>
<td>19. Garagekeepers Liability</td>
<td>$500,000 Comprehensive, $500,000 Collision</td>
</tr>
<tr>
<td>20. Inland Marine-Bailee's Insurance</td>
<td></td>
</tr>
<tr>
<td>21. Moving and Rigging Floater</td>
<td>Endorsement to CGL</td>
</tr>
<tr>
<td>22. Crime and Employee Dishonesty Coverage</td>
<td></td>
</tr>
<tr>
<td>23. Builder's Risk</td>
<td>Provide Coverage in the full amount of Contract, including any amendments</td>
</tr>
<tr>
<td>24. XCU Coverage</td>
<td>Endorsement to CGL</td>
</tr>
<tr>
<td>25. USL&amp;H</td>
<td>Federal Statutory Limits</td>
</tr>
<tr>
<td>26. Carrier Rating shall be A.M. Best Co.'s Rating of A-VII or better or equivalent</td>
<td></td>
</tr>
<tr>
<td>27. Notice of Cancellation, nonrenewal or material change in coverage shall be provided to County at least 30 days prior to action.</td>
<td></td>
</tr>
<tr>
<td>28. The County shall be an Additional Insured on all policies except Workers Compensation and Auto and Professional Liability.</td>
<td></td>
</tr>
<tr>
<td>29. Certificate of Insurance shall show Bid Number and Bid Title.</td>
<td></td>
</tr>
</tbody>
</table>

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: ________________

ITB No. 562-14
ESCROW AGREEMENT

The following pages contain the escrow agreement authorized by 2.2-4334 of the Code of Virginia. Its use is at the Contractor's option. If the Contractor elects to use the escrow procedures, indicate by completing the applicable section of the Bid Form. If the Contractor indicates that it elects to use the escrow procedures, the Contractor must submit the completed escrow agreement to the County, signed by all parties except the County, no later than fifteen (15) days after the date of the notice of award or intent to award issued by the County Purchasing Agent. Escrow agreements received after that time will not be considered.
ESCROW AGREEMENT

THIS AGREEMENT, made and entered into on the date of execution of this agreement by the County by, between and among the County Board of Arlington, Virginia (County), __________________________ (Contractor), and __________________________ (Name of Bank), (Address of Bank), a trust company, bank, or savings and loan institution with its principal office located in the Commonwealth of Virginia (hereinafter referred to collectively as Bank) and __________________________ (Surety) provides:

I. The County and the Contractor have entered into a Contract with respect to __________________________ (Contract). This Agreement is pursuant to, but in no way amends or modifies, the Contract. Payments made hereunder or the release of funds from escrow shall not be deemed approval or acceptance of performance by the Contractor.

II. In order to assure full and satisfactory performance by the Contractor of its obligations under the Contract, the County is required thereby to retain certain amounts otherwise due the Contractor. The Contractor has, with the approval of the County, elected to have these retained amounts held in escrow by the Bank. This agreement sets forth the terms of the escrow. The Bank shall not be deemed a party to, bound by, or required to inquire into the terms of, the Contract or any other instrument or agreement between the County and the Contractor.

III. The County shall from time to time pursuant to its Contract pay to the Bank amounts retained by it under the Contract. Except as to amounts actually withdrawn from escrow by the County, the Contractor shall look solely to the Bank for the payment of funds retained under the Contract and paid by the County to the Bank.

The risk of loss by diminution of the principal of any funds invested under the terms of this Contract shall be solely upon the Contractor.

Funds and securities held by the Bank pursuant to this Escrow Agreement shall not be subject to levy, garnishment, attachment, lien, or other process whatsoever. Contractor agrees not to assign, pledge, discount, sell or otherwise transfer or dispose of his interest in the escrow account or any part thereof, except to the Surety.

IV. Upon receipt of checks or warrants drawn by the County and made payable to it as escrow agent, the Bank shall promptly notify the Contractor, negotiate the same and deposit or invest and reinvest the proceeds in approved securities in accordance with the written instructions of the Contractor. In no event shall the Bank invest the escrowed funds in any security not approved.

V. The following securities, and none other, are approved securities for all purposes of this Agreement:

(1) United States Treasury Bonds, United States Treasury Notes, United States Treasury Certificates of Indebtedness or United States Treasury Bills,
(2)  Bonds, notes and other evidences of indebtedness unconditionally guaranteed as to the payment of principal and interest by the United States,

(3)  Bonds or notes of the Commonwealth of Virginia,

(4)  Bonds of any political subdivision of the Commonwealth of Virginia, if such bonds carried, at the time of purchase by the Bank or deposit by the Contractor, a Standard and Poor's or Moody's Investors Service rating of at least "A", and

(5)  Certificates of deposit issued by commercial Banks located within the Commonwealth, including, but not limited to, those insured by the Bank and its affiliates.

(6)  Any bonds, notes, or other evidences of indebtedness listed in Sections (1) through (3) may be purchased pursuant to a repurchase agreement with a bank, within or without the Commonwealth of Virginia having a combined capital, surplus and undivided profit of not less than $25,000,000, provided the obligation of the Bank to repurchase is within the time limitations established for investments as set forth herein.  The repurchase agreement shall be considered a purchase of such securities even if title, and/or possession of such securities is not transferred to the Escrow Agent, so long as the repurchase obligation of the Bank is collaterized by the securities themselves, and the securities have on the date of the repurchase agreement a fair market value equal to at least 100% of the amount of the repurchase obligation of the Bank, and the securities are held by a third party, and segregated from other securities owned by the Bank.

No security is approved hereunder which matures more than five years after the date of its purchase by the Bank or deposit by the Contractor.

VI.  The Contractor may from time to time withdraw the whole or any portion of the escrowed funds by depositing with the Bank approved securities in an amount equal to, or in excess of, the amount so withdrawn.  Any securities so deposited or withdrawn shall be valued at such time of deposit or withdrawal at the lower of par or market value, the latter as determined by the Bank.  Any securities so deposited shall thereupon become a part of the escrowed fund.

Upon receipt of a direction signed by the County Comptroller, the Bank shall pay the principal of the fund, or any specified amount thereof, to the Treasurer of Arlington County, Virginia for the account of the County.  Such payment shall be made in cash as soon as is practicable after receipt of the direction.

Upon receipt of a direction signed by the County Comptroller, the Bank shall pay and deliver the principal of the fund, or any specified amount thereof, to the Contractor, in cash or in kind, as may be specified by the Contractor.  Such payment and delivery shall be made as soon as is practicable after receipt of the direction.

VII.  For its services hereunder the Bank shall be entitled to a reasonable fee in accordance with its published schedule of fees or as may be agreed upon by the Bank and the Contractor.  Such fee and any other
costs of administration of this Agreement shall be paid from the income earned upon the escrowed fund and, if such income is not sufficient to pay the same, by the Contractor.

VIII. The net income earned and received upon the principal of the escrowed fund shall be paid over to the Contractor in quarterly or more frequent installments. Until so paid or applied to pay the Bank's fee or any other costs of administration, such income shall be deemed a part of the principal of the fund.

IX. The Surety undertakes no obligation hereby but joins in this Agreement for the sole purpose of acknowledging that its obligations as surety for the Contractor's performance of the contract are not affected hereby.

WITNESS the following:

______________________________, CONTRACTOR

By: ___________________________ (Officer/Partner/Owner)

Date: __________________________

Bank Attest: _____________________ (Bank Officer)

Bank: __________________________

By: ___________________________ (Vice President)

Date: __________________________

Surety Attest: _____________________ (Surety Company)

By: ___________________________ (Resident Virginia Agent)

______________________________ (Address)

Date: __________________________

By: ___________________________ (Attorney in fact)

Date: __________________________

THE COUNTY BOARD OF ARLINGTON COUNTY, VIRGINIA

By: ___________________________ (Purchasing Agent)
### DIVISION 1 – GENERAL REQUIREMENTS
- **01000** General Provisions and Requirements
- **01300** Submittals
- **01400** Testing
- **01500** Temporary Erosion and Sediment Control

### DIVISION 2 – SITE WORK
- **02100** Clearing and Grubbing
- **02200** Earthwork
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- **02350** Cofferdams
- **02400** Sheeting, Shoring and Bracing
- **02500** Gravity Sewers and Appurtenances
- **02505** Storm Sewers and Appurtenances
- **02510** Sanitary Sewers and Appurtenances
- **02515** Televised Inspection of Sewers
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- **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 Crossing
- **02650** Restoration of Roadway
- **02750** Curb and Gutters
- **02800** Landscaping
- **02801** Seeding & Sodding
- **02950** Tunneling
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- **03100** Concrete Formwork, Reinforcement and Materials
- **03400** Precast Concrete
DIVISION 4 – MASONRY
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DIVISION 7 – THERMAL & MOISTURE PROTECTION
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STANDARD DETAILS

  M.  MISCELLANEOUS STANDARDS
  R.  ROADWAY STANDARDS
  D.  STORM DRAIN STANDARDS
  W.  WATER MAIN STANDARDS
  S.  SANITARY SEWER STANDARDS
<table>
<thead>
<tr>
<th>Revision</th>
<th>Description</th>
<th>Date</th>
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<tr>
<td>1</td>
<td>Removed Details R-2.3, R-2.3B St 1of2, R-2.3B 2of3, R-2.3C 1of2, R-2.3C 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</td>
<td>5/13/2010</td>
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<td>2</td>
<td>Removed the General Conditions, Sections 01100, 02110, 02201, 16550 &amp; 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, R-5.6B, R-5.3C, R-5.7, R-5.8, R-5.9, R-5.9A &amp; R-5.9B Modified Sections 01000, 01300, 01400, 01500, 02100 &amp; 02200. Updated the Table of Contents</td>
<td>02/17/2012</td>
</tr>
<tr>
<td>3</td>
<td><strong>Revised</strong>: 01400 (Testing), 02400 (Sheeting, Shoring, &amp; Bracing), 02505 (Storm Sewers &amp; Appurtenances), 02510 (Sanitary Sewers &amp; Appurtenances), 02550 (Water Mains &amp; Appurtenances); <strong>Created</strong>: 02500 (Gravity Sewers &amp; Appurtenances), 02515 (Televised Inspection of Sewers); <strong>Revised Standards</strong>: M-3.0 (Pipe &amp; Bedding Details), D-1.7 (Catch Basin w/ Grate Top), D-3.2, Storm Sewer Manhole w/ Grate Cover), W-8.1 and W-8.2 (Water Service Connections), W-9.3 through W-9.6 (Water Meter Installation), W-10.0 (Water Meter Fact Sheet) <strong>Created Standard</strong>: R-2.9 (Concrete Valley Gutter), R-8.1 (Bike Rack Layout) <strong>Eliminated Standards</strong>: 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, <strong>Renamed</strong> the DW- (Driveway) series of standards as R-2.3 and R-2.4(A-C);</td>
<td>9/30/13</td>
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SECTION 01000 - GENERAL PROVISIONS AND REQUIREMENTS

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 equipments 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
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
- 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. 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 are 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 will 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 contractors 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.
SECTION 01300 SUBMITTALS AND SUBSTITUTIONS

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 will 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 will be returned by the Engineer without action, or will 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 will 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 will 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 will 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 will 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 will 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 will bear no additional expense as a result of any Substitution.
f. The Engineer will 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 will review the Shop Drawings with reasonable promptness.

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.
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 these specifications shall be considered incidental to the work, and the Contractor will 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.
SECTION 01500  TEMPORARY EROSION AND SEDIMENT CONTROL

PART 1 - GENERAL

1. Description of Work

This work shall consist of the application of temporary measures throughout the life of the project to control erosion and siltation. Such 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. Temporary erosion and siltation control measures as described herein, shall be applied to erodible material exposed by any activity associated with the construction, and consistent with state and local control standards.

2. Related Work Specified Elsewhere

Section 02100- Clearing and Grubbing

Section 02200- Earthwork

3. Applicable Specifications

Erosion and Sediment Control (Chapter 57 of the Arlington County Code)

4. Applicable References


5. Submittals

Prior to the start of the work the Contractor shall prepare and submit a plan for applying temporary and permanent erosion and siltation control measures. The plan shall include, but is not limited to, the operations of clearing and grubbing, stripping of topsoil, grading, stabilizing cleared areas, dewatering, and the construction of structures at watercourses. Construction work shall not commence until the schedule of work and the methods of operations have been reviewed and approved by the Engineer.

Temporary measures shall be coordinated with the construction of permanent 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.

6. Permits

Unless otherwise specified, the Contractor is responsible for obtaining and complying with any and 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, and Virginia Stormwater Management Program Permits issued by the Virginia DCR.
PART 2 - MATERIALS

Materials shall be at the Contractor’s option with the approval of the Engineer in accordance with Arlington County Code, Erosion and Sediment Control Ordinance (Chapter 57).

PART 3 - EXECUTION

7. Installation and Maintenance of Erosion and Sediment Control
   a. No grading operations will be allowed until temporary sediment and erosion control measures have been installed in accordance with the approved plan conforming to the requirements of Arlington County Erosion and Sediment Control Ordinance.
   b. Control measures shall be periodically cleaned of silt and maintained. Immediately after every rainstorm, all control measures shall be inspected and any deficiencies corrected by the Contractor.
   c. The County reserves the right to order the performance of other temporary measures not specifically described herein to correct an erosion or siltation condition.
   d. Temporary control measures may be removed when the area has been stabilized.

8. 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 Engineer, the grubbing of root mat and stumps shall be confined to the area over which excavation is to be actively prosecuted 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, is to remain denuded longer than 30 days without temporary seeding or otherwise stabilizing the area.

9. Dewatering and Discharges
   a. All dewatering operations shall be conducted in a manner that prevents or minimizes the amount of sediment or other pollutants which discharge to the County storm sewer system, which includes curb and gutter, or any open watercourse. Any discharge from dewatering operations shall be properly filtered prior to being discharged. Dewatering activities shall not create any erosion nor flooding. A dewatering plan must be included as part of the Erosion and Sediment Control plan with sufficient detail to ensure that the proposed dewatering will meet all applicable requirements.
b. All non-stormwater discharges to the County’s storm sewer system, which includes curb and gutter, or any open watercourse must comply with the conditions of Section A.1.a.3 of the County’s VSMP Municipal Separate Storm Sewer System (MS4) Permit. 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 without approval from Arlington County. A separate Virginia Pollutant Discharge Elimination System (VPDES) permit, issued by DEQ may be required.

c. Contractors shall not dump or dispose of anything in a storm drain, street, stream, or riparian area that could cause adverse conditions. Contractors shall employ good housekeeping and pollution prevention measures at work sites at all times. Work areas, including staging or stockpile areas, shall be kept clean and free of trash and debris to the maximum extent possible. Construction materials shall be properly stored and secured. Stockpiled materials shall be kept covered and perimeter controls shall be employed to minimize exposure to wind, precipitation, and runoff. Equipment and vehicle washing shall not be permitted on-site without proper controls and facilities to collect all sediment and/or pollutants. Spill kits and appropriate tools for cleanup shall be kept on-site at all times. Spills shall be cleaned immediately using absorbent materials or other appropriate measures which will prevent any pollutants from entering a storm drain or open watercourse.

PART 4 - MEASUREMENT AND PAYMENT

10. Measurement and Payment

a. Unless otherwise specified, no separate measurement of quantities will be made for this work. Temporary erosion and sediment control as detailed on the approved plan is considered to be a subsidiary obligation to the Contract and therefore, there will be no payment made for this work.

b. No measurement will be made for temporary erosion control required to correct conditions created due to the Contractor’s negligence, carelessness or failure to install permanent controls in accordance with the approved plan, or methods or sequence of such work.

c. No measurement will be made for limiting the area of construction operations as directed by the Engineer. The cost of shaping the top of earthwork, constructing temporary earth berms, slope drains, straw bales, etc., considered being a subsidiary obligation to the Contract and therefore, there will be no payment made for this work.

d. In the event the Contractor repeatedly fails to satisfactorily control erosion and siltation, the Owner 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, will be deducted from monies due to the Contractor for other work.
SECTION 02100  CLEARING AND GRUBBING

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 will 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**

**PART 3 - EXECUTION**

6. **Clearing**

The area of clearing shall be maintained within the limits shown on the plans. Individual trees, groups of trees and other vegetations, which are to remain within the areas to be cleared, are to be undisturbed, standing and not injured. Tree protection boundaries will be established and secured as directed by the Urban Forester (DPRCR) to protect the root systems as well as above ground trees. The tree protection area shall not be violated.

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 will be made for this work. Clearing and grubbing is considered to be a subsidiary obligation of the contract and, therefore, there will be no payment made for this work.
SECTION 02200 EARTHWORK

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 will be solely responsible for all necessary notification and coordination
with the utility owner(s). There will 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 will 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.

**PART 2 - MATERIALS**

10. **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.

11. **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 quackgrass rhizomes and the nut-like tubers of nutsedge), 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.

12. Select Borrow

Select Borrow shall conform to VDOT Section 207 – Select Material, Type I.

13. 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

14. 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 will 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 will be allowed for repair of damages.

15. 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 at 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.

16. Sheetig, Shoring, and Bracing

Provide sheeting, shoring and bracing in accordance with Section 02400.

17. 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 will 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 will 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 will 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 will 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 will be responsible for alternate disposal arrangements. No additional compensation will be made
if the Trades Center does not have adequate space to accommodate materials from the project.

18. **Dewatering**

At all times during construction – provide, place and maintain ample means and devices with which to remove promptly all water entering trenches and other excavations. Keep excavations dry 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.

19. **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.
20. **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 will 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.

21. **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.

22. **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)”.


   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.
23. **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.

24. **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 will 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 will 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 T-99.

   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 will 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 will not be required on the original course.
PART 4 - MEASUREMENT AND PAYMENT

25. Excavation

When explicitly included as a pay item, Excavation will be measured by the cubic yard as illustrated on the approved plans, or as approved by the Project Officer. Excavation in excess of that shown on the approved plans will not be compensated, unless specifically approved in advance by the Project Officer. Payment will include all labor, materials, and equipment and will include excavation, handling, storage and disposal of materials, backfilling, compaction, testing, and all other activities necessary to comply with these Specifications.

26. Fill

When explicitly included as a pay item, Fill will be measured by the cubic yard in place as illustrated on the approved plans, or as approved by the project Officer, and will include all materials, equipment, and labor to construct the fills or embankments as illustrated on the construction drawings. Unless otherwise specified, Backfilling of excavations will not be compensated as Fill. Payment will include all clearing and grubbing, preparation, acquisition, transporting, storing, and handling of material, placement, shaping, compaction, and other activities necessary to comply with these Specifications.

27. Over excavation

When included as a pay item or Stipulated Price Item, and authorized by the Project Officer, Over Excavation conducted as a result of obstructions or unsuitable bedding for pipes or structures shall be measured in cubic yards excavated in excess of the contract documents. Payment shall be made for cubic yards and will include excavation, handling, storage and disposal of materials, backfilling, compaction, testing, and all other activities necessary to comply with these Specifications. When not included as a pay item or Stipulated Price Item, Over Excavation will be paid as Excavation. No payment shall be made for any Over Excavation unless ordered in writing by the Engineer prior to commencement of the operations.

28. Select Borrow

When included as a pay item or Stipulated Price Item, and authorized by the Project Officer, Select Borrow shall be measured in cubic yards in place. Payment will include acquisition of materials, transport, preparation, handling, storage, placement, compaction, testing, and other activities necessary to comply with these Specifications.

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 will 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 Engineer. The Contractor shall identify appropriate methods to protect the unidentified facilities, and any compensation deemed due, and shall obtain approval from the Engineer prior to undertaking any action.
30. Testing

Testing will be considered subsidiary to the Work and no compensation will be approved. If the Project Officer directs testing in excess of that required by the Contract Documents, the Contractor shall be entitled to compensation unless such testing reveals noncompliant work.
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 will break the rock approximately to the intended lines and grades.

D. Avoid excessive cracking of the rock upon or against which any structure will 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:

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<th>Sieve Size</th>
<th>Total Percent Passing</th>
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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 will 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 will 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 will 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 will 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 will ensure for plane surfaces a maximum variation from a true plane of not more than 1.5 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-railed 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 will 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 be at the unit price stated in the bid proposal.
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 slope preparation, excavation, erosion and sediment control, filter material, backfill 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 will be below water level at all times may be of any species of wood which will 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 will 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 will 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 will allow a secure connection to the pile and will 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:

<table>
<thead>
<tr>
<th>Length of Pile</th>
<th>Tip Diameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 40 feet</td>
<td>8 inches</td>
</tr>
<tr>
<td>40 to 60 feet</td>
<td>7 inches</td>
</tr>
<tr>
<td>Over 60 feet</td>
<td>6 inches</td>
</tr>
</tbody>
</table>

The minimum diameter of piles at a section four (4) feet from the butt, measured under the bark, shall be as follows:

<table>
<thead>
<tr>
<th>Length of Pile</th>
<th>Diameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>So. Yellow Pine, Douglas Fir, or Species of So. Cypress</td>
<td>All Other</td>
</tr>
<tr>
<td>20 feet &amp; under</td>
<td>11 inches</td>
</tr>
<tr>
<td>20 to 30 feet</td>
<td>12 inches</td>
</tr>
<tr>
<td>30 to 40 feet</td>
<td>12 inches</td>
</tr>
<tr>
<td>Over 40 feet</td>
<td>13 inches</td>
</tr>
</tbody>
</table>

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 will 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 will 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 will 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 will constrict the stream flow; a description of construction activities
which will 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, excavation, placement, removal and backfill.
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 will 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 will 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 will 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 Engineer, 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 incidental 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 incidental 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.
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 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)
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 will 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.

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.

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:

<table>
<thead>
<tr>
<th>12”</th>
<th>15”</th>
<th>18”</th>
<th>24”</th>
<th>30”</th>
<th>36”</th>
<th>42”</th>
<th>48”</th>
<th>60”</th>
<th>72”</th>
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<tr>
<td>2’</td>
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</tr>
</tbody>
</table>

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.

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, and all work incidental to providing a complete sewer installation.

4.2 Manholes

Manholes for the various internal diameters shall be measured by the vertical foot from the invert of the outlet pipe to the top of the manhole cover. Payment shall include excavation, backfill, bedding, foundation, base and components, channels, sleeves, frame and cover, intermediate landings, steps, restoration and all other work necessary for a complete installation.

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, and incidentals necessary for complete adjustment.

4.4 Excavation Below Grade and Additional Bedding

Over excavation, additional bedding and associated work shall be measured and paid in accordance with Section 02200.
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 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)


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 asphal tic 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 100-year 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 will 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.
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 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 - StormSewers
Section 02515 – Televised Inspection of Sewers
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:

<table>
<thead>
<tr>
<th>Establishment</th>
<th>Average Daily Usage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single Family</td>
<td>225 gallons per day (gpd)/unit</td>
</tr>
<tr>
<td>Multi-Family</td>
<td>205 gpd/unit</td>
</tr>
<tr>
<td>Apartment</td>
<td>160 gpd/unit</td>
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<td>Hotel</td>
<td>80 gpd/room</td>
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<td>Manufacturing</td>
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<tr>
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<tr>
<td>Restaurant</td>
<td>0.40 gpd/sq. ft. GFA</td>
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<tr>
<td>Service</td>
<td>0.09 gpd/sq. ft. GFA</td>
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<tr>
<td>Intensive Service</td>
<td>0.50 gpd/sq. ft. GFA</td>
</tr>
<tr>
<td>Other</td>
<td>0.07 gpd/sq. ft. GFA</td>
</tr>
<tr>
<td>School</td>
<td>0.03 gpd/sq. ft. GFA</td>
</tr>
<tr>
<td>Church</td>
<td>1000 gpd/church</td>
</tr>
</tbody>
</table>

**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 Gravityu 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 (CL-50) 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 will 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

<table>
<thead>
<tr>
<th>Manhole Depth In Feet</th>
<th>4-Foot Inside Diameter (seconds)</th>
<th>5-Foot Inside Diameter (seconds)</th>
<th>6-Foot Inside Diameter (seconds)</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>20</td>
<td>26</td>
<td>33</td>
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<td>10</td>
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</tr>
<tr>
<td>30</td>
<td>74</td>
<td>98</td>
<td>121</td>
</tr>
</tbody>
</table>

### 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

<table>
<thead>
<tr>
<th>PIPE DIAMETER, INCHES</th>
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</thead>
<tbody>
<tr>
<td>PIPE LENGTH (FEET)</td>
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<tr>
<td>4</td>
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<td>6</td>
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<td>8</td>
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<tr>
<td>24</td>
</tr>
</tbody>
</table>

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### 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, sewage excavation, backfill, tapping main sewer, pipe, fittings, and all cap work incidental to 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 incidentals necessary for 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 will be done one segment at a time from manhole to manhole and the flow in the section being inspected will 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 will 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 will 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 will 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, will be recorded on electronic media and a copy of such records will 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.

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 incidental to Television Inspections. If not included as a specific pay item, Television Inspection should be considered a subsidiary obligation to installation of any new sewer.
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 02950 - Tunneling
Section 02951 - Boring and Jacking

1.3 Applicable Codes, Standards, and Specifications

A. American National Standards Institute (ANSI)
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)

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 will 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 5-1/4 inches, 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, will 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 M-9. 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, will 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 will 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 5-590-1160):
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 W-4.0).

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 blowoffs 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 blowoff 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, will 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.

4. 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 will be removed by DES as required. No credit or allowance will 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 requirements.

2. Water for disinfection, flushing and testing will 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 2.5 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 will 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 will 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
1. 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 24 hours apart shall be obtained from the distribution system before the system can be placed into service. Samples shall be collected at all accessible locations not exceeding 2,000 feet apart in the line downstream.
from where the pipe was filled with water. 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.

2. 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 dechlorination has been achieved.
3. Contractor shall be responsible to identify, implement, and monitor appropriate dechlorination 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. Superchlorinated 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.

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, trench maintenance, abandoning and/or removing existing mains and appurtenances as required and all other work incidental to providing a complete water main installation.

4.2 Valves

Valves shall be measured as each, by size and type. Payment shall include excavation, bedding, backfill, 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, excavation, bedding, drainage gravel, thrust protection, backfill, disinfection, and certification.

4.4 Existing Fire Hydrants – Removed

Existing fire hydrants removed shall be measured as each. Payment shall include excavation, sheeting, shoring, backfilling, 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, 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, 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 and backfill.

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 and backfill.

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, and backfill.

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, and backfill.

4.11 Water Service Connections

Water Service Connections shall be measured as each, by size. Payment shall include excavation, provision of all materials and backfill. The County shall provide the water meter at no cost for service relocations.

4.12 Restoration in Paved Areas

Payment for restoration in paved area shall normally be made separately unless indicated otherwise on the approved plans or special provisions.
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 will 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-2 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-2A in conformance with Section 211 of VDOT Specifications.

The use of fine or coarse aggregate which tend to polish under traffic will 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 will be provided by the County.

**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 measured to the street width shown on the approved plans regardless of the actual dimension constructed times its actual length 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 installed and shall include 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 regardless of the actual dimensions constructed. Payment shall be in cubic yards of material installed.
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 will 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-2A 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 measured to the width shown on the approved plans regardless of the actual dimension constructed. Payment shall be in tons of bituminous concrete installed.

4.2 Aggregate base shall be measured to the width shown on the approved plans regardless of the actual dimensions constructed. Payment shall be in cubic yards of material installed.
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 will 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 measured to the width shown on the plans, regardless of the actual dimension constructed, unless otherwise approved by the Engineer, times its
4.2 Concrete driveway entrances shall be measured by the square yard of driveway entrance placed to the limits shown on approved drawings and indicated by the Engineer. Payment shall be in square yards for each type of driveway entrance.

4.3 Aggregate base shall be measured to the width and depth shown on the approved plans regardless of the actual dimensions constructed, unless otherwise approved by the Engineer. Payment shall be in cubic yards of material constructed.

4.4 Excavation shall be measured in cubic yards in its original condition based on the cut sheets and typical section. Payment shall be in cubic yards as described in Section 02201.
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

<table>
<thead>
<tr>
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</tr>
</tbody>
</table>

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 density with a tolerance of $\pm 1/4$-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 sand-
filled 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 measured to the width shown on the plans, regardless of the actual dimension constructed, unless otherwise approved by the Engineer, times its actual length. Payment shall be in square yards for each type of masonry walk installed, complete in place and shall include the necessary preparation of the sub grade surface, aggregate base, sand leveling base, filter fabric and edge restraints, if required.

4.2 Excavation shall be measured in cubic yards in its original condition based on the cut sheets and typical sections. Payment shall be in cubic yards as described in Section 02201.
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 will 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 will drop to 40 degrees F or below before the mortar has set. Work will 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.

Table 1

Grading requirements for Bedding and/or Joint sand

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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 ASTM-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 pavers 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 pacer 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 measured to the width shown on the plans, regardless of the actual dimension constructed times its actual length. Payment shall be in square yards for the type paver crosswalk installed, including the necessary preparation of sub grade, restoration of adjacent pavement, excavation, aggregate subbase, concrete base and incidentals necessary for a complete installation.
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 will 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-2 and SM-2A 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-2 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 will 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 will 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 Pavement restoration shall be measured in square yards of the surface area restored based on the payment width, regardless of actual dimension constructed times its actual...
length. Payment shall be in square yards per category of street pavement restored and shall include the necessary preparation of the sub grade surface, tack coats, bituminous concrete materials, and the crusher run backfill required in paragraph 3.3.

4.2 Concrete curb and gutter shall be measured in linear feet of actual replacement. Payment shall be in linear feet of curb and gutter at the price bid.

4.3 Concrete sidewalk restoration shall be measured in square yards to restore to original width. Payment shall be in square yards for each type of concrete walk, plain concrete or concrete with brick, and shall include the cost of stress columns.

4.4 There shall be no payment for temporary asphalt patch.
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 of actual construction. Payment will be at the unit price bid per type of curb section bid, except where the curb or curb and gutter is adjacent to catch basins or drop inlets, in which case the unit price for such catch basins or drop inlets shall include that part of the curb and gutter within the limits of the structure.

4.2 Subbase material shall be measured to the width and depth shown on the approved plans regardless of the actual dimensions constructed. Payment shall be in cubic yards of material installed.
PART 1 - GENERAL

1.1 Description of Work

Provide all plant, materials and labor required to execute this work as indicated on the approved plans, as specified and as necessary to complete the Contract, including, but not limited to, soil treatment; planting of trees, topsoil in planting areas; protection, maintenance, warranty, and replacement of plants; related items of work as indicated on drawings; inspection; and maintenance.

1.2 Related Work Specified Elsewhere

Section 02100 - Clearing and Grubbing
Section 02200 - Earthwork for Structures and Pipelines
Section 02801 - Seeding and Sodding

1.3 Applicable References

A. Arlington County Cooperative Extension Office
B. Erosion and Sediment Control Ordinance (Chapter 57 of the Arlington County Code)
C. Hortus III, 1979 Edition
D. American Association of Nurseryman's Standards
E. Maryland Forest Conservation Manual

1.4 Permits

Before any tree may be planted on public rights-of-way, or County easements, a permit from the Department of Environmental Services shall be obtained, and reviewed and approved by PRCR.

1.5 Plant Warranty and Replacement

A. Warranty: Guarantee that plants will be alive and in satisfactory growth for a period of two years, beginning the day the County has approved the planting.

B. Replace dead or dying plants as soon as possible at no cost to the County.

C. Plants used for replacement shall be the same species and size as specified in Plant List; plant, mulch, maintain and warrant as specified.

D. Properly maintain all planting and planting areas during the progress of the work and for a maintenance period of 60 days after acceptance.
PART 2 - MATERIALS

2.1 Shrubs and Trees

A. Shrubs and trees shall be of a variety, size and quantity as shown on the approved plans and shall be planted where shown on the planting plan. Plants shall be symmetrical, typical for variety and species, sound, vigorous, free from plant disease, insect pests or their eggs, and shall have healthy, normal root systems, well filling their containers, but not to the point of being root-bound. Plants not conforming to these requirements shall be considered defective, and shall be removed from the site immediately, and replaced with approved stock at the Contractor's expense.

2.2 Water

Water shall be provided by the Contractor for use of this trade.

2.3 Miscellaneous

Mulch: Shredded hardwood.

Soil: Natural for the area, fertile, friable and within acceptable pH limits for the shrubs and trees.

Fertilizer: Of the type and composition recommended by the Arlington County Cooperative Extension Office, 855 North Edison Street, Arlington, Virginia.

Tree Stakes: 2-inch x 2-inch x 8-inch hardwood pointed on one end.

Tree Grates: 180° square, flush, non-bolt, equal of Neenah Type R-8640.

PART 3 - EXECUTION

3.1 Delivery, Storage, and Soil Testing

Contact the Arlington County Cooperative Extension Office for soil testing. Deliver plants to the site in a healthy condition and properly store and protect for planting.

3.2 Grading

A. Do not plant until finish grades are established and planting areas are properly prepared and graded.

B. Do not work the soil when the moisture content is so great that excessive compaction will occur; nor when it is so dry a dust will form in the air or that clods will not break readily.
Apply water, if necessary, to provide ideal moisture for filling and for planting as herein specified.

C. Preliminary grading shall be done in such a manner as to anticipate the finish grading. Remove excess soil or redistribute before application of fertilizer and mulch. Where soil is to be replaced by plants and mulch, make allowances so that, when finish grading has begun, there shall be no deficiency in the specified depth of mulched planting beds.

D. When preliminary grading, including weeding and fertilizing, has been completed and the soil may be readily worked, grade all planting areas to a smooth, even and uniform plane with no abrupt change of surface. Slope soil areas adjacent to buildings away from the buildings, and direct surface drainage as indicated on the drawings.

3.2 Planting of Shrubs and/or Trees

A. Remove canned stock by cutting can vertically on two opposite sides of can with instrument approved for the purpose.

B. Spacing: Where plant material is shown on the drawings in a “loose” pattern, space the material as shown, at all times maintaining an unequal, random spacing and conforming to the Tree Planting Details of the Construction Standards.

C. Dig tree pits and plant pits in accordance with the Tree Planting Details, Drawing Nos. R-7.1, R-7.2 and R-7.6 of these Construction Standards.

D. Setting: Plants shall bear some relation to soil level when planted as they did when in container. Place each plant in center of plant pit.

E. Cut burlap, twine and wire baskets from top 12 inches of rootball and remove from site.
   1. Backfill with 1/2 clean existing soil, 1/4 sand, 1/4 peat moss.

F. Firmly tamp backfill material into plant pits around and under the root ball to force out all air pockets. Backfill in conformance with the Tree Planting Details of the Construction Standards.

G. Basin each plant with a berm 3 inches in height above crown of root ball immediately after planting and thoroughly water to saturate the root ball and backfill.

H. Stake all trees with hardwood stakes driven 2’ into firm ground and secure tree to stake as per detail R-7.2 (Planting and Guying For Trees Over 2 1/2-inch Caliper).
PART 4 - MEASUREMENT AND PAYMENT

4.1 Shrubs and trees shall be measured as each, by variety and size. Payment shall include the labor, materials and equipment necessary for a proper and complete installation, but shall not include tree grates.

4.2 Tree grates shall be measured as each, by size. Payment shall include the labor, materials and equipment necessary for a complete installation.
PART 1 - GENERAL

1.1 Description of Work

Provide all labor, materials, tools and equipment as required to have topsoil, fertilizer, lime, mulch, seed and/or sod applied on all areas disturbed by construction and all areas called for on the approved plans.

1.2 Related Work Specified Elsewhere

Section 02100 - Clearing and Grubbing
Section 02200 - Earthwork for Structures and Pipelines

1.3 Applicable Specifications Virginia Field Seed Law

1.2 Applicable Reference

Erosion and Sediment Control Ordinance (Chapter 57 of the Arlington County Code)
Virginia Tech Specification

1.5 Submittals

In accordance with Section 01300 submit proposed names of fertilizers, sod and seed mixtures together with their composition and any certificates requested to the Engineer for approval.

1.6 Quality Assurance

The results of testing two samples from each source of topsoil to ensure that proper types and quantities of soil conditioners, and fertilizers, will be used resulting in a dense, vigorous growth of perennial lawn-quality grass. The results of this test will determine rates and types of fertilizers and lime. For seeding, the Virginia Tech rates for seeding shall be used as specified by VA/MD seed/sod program, if available.

1.7 Testing

Test seed within 6 months of seeding to meet the requirements of the Virginia Field Seed Law for percentage of germination as follows:

- Kentucky 31: 81%
- German Foxtail Millet: 78%
- Abruzzi Tye: 78%
- Red Top: 77%
PART 2 - MATERIALS

2.1 Topsoil

A. Topsoil shall be a natural, fertile, friable soil, typical of productive soil in the vicinity, obtained from naturally well drained areas, neither excessively acid nor alkaline, and containing no substances harmful to grass growth.

2.2 Fertilizer

A. As per Virginia Tech Specifications, soil test will be taken and fertilizer will be applied for seeding areas disturbed by clearing operations.

2.3 Seed

A. For seeding areas disturbed by clearing operations only; where vegetation remains (per acre):
   March to July:
   Tall fescue, per current year Virginia Tech Recommended List: 50 pounds
   German Foxtail Millet: 30 pounds
   August to February:
   Tall fescue, per current year Virginia Tech Recommended List: 70 pounds
   Abruzzi Rye: 20 pounds

B. For all other areas (per acre):
   Tall fescue, per current year VirginiaTech Recommended List
   Red Top: 3 Pounds

Under all conditions, seed shall be of the latest seed crop available.

2.4 Lime

Per acre: 2 tons/ground limestone of such fitness that 50% will pass through a U.S. Standard No. 100 mesh screen and 100% will pass through a U.S. Standard No. 10 mesh screen.

2.5 Mulch

Per acre: 2 tons of small grain mulch of high quality showing no rotting or caking and reasonably free of weeds.

2.6 Sod

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Sod shall be vigorous, well-rooted, healthy turf, free from disease, insect pests, weeds, other grass, stones and of similar mix as used in seeding lawns. It shall be suitable character for the purpose intended and for the soil in which it is to be planted. Sod shall be certified at least eight (8) inches wide, not less than twelve (12) inches long, and shall have at least one and one half (1-1/2) inches in thickness, of dirt on its roots. Do not use broken or damaged sod.

2.7 Jute or Fabric

A. Jute matting shall be of a uniform open plain weave of undyed and unbleached single jute yarn of a width of 4 feet. All material shall be new. Staples shall be made from No. 8 gauge or heavier steel wire and bent to form a "U" with a staple 1 to 1-1/2 inches wide with 6 inch feet.

B. Fabric shall be a combination of paper and yarn manufactured into plastic netting interwoven with paper strips as manufactured by Hold/Gro, Gulf States Paper Corporation. Staples shall be 6 inches high carbon iron.

PART 3 - EXECUTION

3.1 Topsoil

A. After approval of rough grading rototill all areas indicated on the drawings and on other areas damaged by construction, as specified by PRCR, to a depth of 4-inch, removing stumps, all foreign objects and stones larger than one inch diameter; place topsoil approved by PRCR on all areas and incorporate by rototilling into subsoil. Topsoil origin to be specified and approved by PRCR; Certified soil tests specifying pit, % organic matter, textural analysis and N-P-K levels to be made by contractor and approved by PRCR before delivery.

B. Remove stripped topsoil not used at the job site and dispose in a location approved by the Engineer.

3.2 Fertilizing and Rolling

If required by results of soil tests, Spread soil conditioners and fertilizers and thoroughly incorporate by rototilling work into topsoil to a depth of 4 inches. Rake topsoil until the surface is finely pulverized and smooth. Compact with rollers weighing not over 100 pounds per linear foot of tread, to an even surface conforming to the prescribed lines and grades. Minimum depth shall be 3 inches after compaction.

3.3 Seeding

A. Seed only when weather conditions are suitable between April 1 and May 30, or August 15 to October 1, unless approved by the Engineer. Use only certified seed blending Kentucky bluegrass cultivars with perennial ryegrass varieties approved by PRCR.
B. If there is a delay in seeding, during which weeds grow or soil is washed out, remove the weeds or replace the soil before sowing the seed, without additional compensation. Immediately before seeding is begun, lightly rake the soil.

C. If required by soil test results, uniformly apply lime, urea form and triple super phosphate or organic fertilizer approved by (DPRCR), with broadcast spreaders prior to seedbed preparation.

D. Sow seed with mechanical spreaders at the specified rate on a calm day. Sow one-half the seed in one direction and the other half at right angles. Seed shall be raked lightly into the soil to a depth of 1/4-inch and rolled with a roller weighing not more than 100 pounds per linear foot of tread.

E. If seeding by hydroseeder, add 500 pounds of wood cellulose fiber per acre and mix with the seed and the 10-10-10 fertilizer at the specified rate. Apply all seed mix within 45 minutes after mixing in hydroseeder to prevent fertilizer damage to seed and inoculants.

F. Keep the surface moist by a fine spray until the grass shows uniform germination over the entire area. Wherever poor germination occurs in areas larger than three (3) square feet, reseed, roll, and water as necessary to obtain proper germination.

3.4 Mulching

Apply mulch immediately after seeding. Loosen baled straw and thoroughly break up before placing. Begin placement of mulch on the windward side and from the toe to slopes. Do not grind, cut or crush mulch into pieces so small as to form a mat. Cutting mulch to aid in distribution may be accomplished, provided that 10 to 25 percent of the seeded area will be exposed.

On slopes 2 to 1 and greater provide jute matting or Hold/Gro stapled 18 inches to 3 feet apart using closer spacing around curves and areas of concentrated storm water runoff.

Install jute strips beginning 12 inches behind the top of slope. Bury the top ends in a slit trench with prior approval by PRCR, urban forester. Trench should be 6 inches deep, and staple to trench bottom. Reinforce slit trench with a new row of staples one foot below trench and space at intervals of 6 to 10 inches. Staple all overlaps and the center of the material at intervals of 18-inch to 3 feet down the slope. After the jute matting is in place, overseed.

Install Hold/Gro with the fabric running vertically from the top of the slope in the direction of anticipated water flow. Do not stretch the material. Staple Hold/Gro in the same manner as specified for the jute.

3.5 Sodding

A. The Contractor may plant ground cover, not requiring mowing, on grades exceeding a 2 to 1 slope. The contractor may sod all grades not exceeding a 3:1 slope in lieu of jute or Hold/Gro. or equivalent.
B. On sloping areas where erosion may be a problem, sod shall be laid parallel to the contours of the slope with staggered joints and secured by tamping, pegging or other approved method.

C. Plant only certified sod only when the soil is moist and favorable for growth. Shape the area to be sodded and finish to the lines and grades indicated on the drawings. Loosen the surface prior to placing sod. Keep the grade moist by sprinkling, if necessary, sod on the prepared surface with the edges in close contact. Each piece of sod laid shall be fitted and tamped into place with hand tampers not less than one hundred (100) square inches in area. Apply a sufficient quantity of water to all sod after laying and to prevent the sod from drying out for a period of at least two weeks to ensure growth.

3.6 Inspection

At the beginning of the next planting season after that in which the permanent grass crop is sown, inspect the seeded areas. Promptly reseed any section not showing dense, vigorous growth. Water, weed, cut and otherwise maintain the lawn until the end of that planting season.

PART 4 - MEASUREMENT AND PAYMENT

Seeding and sodding shall be measured in square yards. Payment shall include all labor, materials, and equipment including topsoil, fertilizers, seed or sod, mulch, jute or other synthetic matting and staples necessary to protect against erosion and required for a satisfactory growth of grass or sod.
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 will 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 the liner plates, sand or grouting, dewatering and carrier pipe installed, complete in place.
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 will 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 will 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 will 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 the casing pipe and carrier pipe installed, complete in place.
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.


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 will 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 will 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 will 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 will 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 will 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 will 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 load-carrying 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 will 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 will 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.
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 C-478 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 will 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 will 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 cold-drawn 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 will 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 will 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, excavation and backfill, 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 will 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 the concrete rubble backing, excavation, backfill, 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. 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.
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, will 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 will 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 will 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 will 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 will 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)

1.3 Surfaces not to be Painted

Refer to Section 09900, Paragraph 1.4

1.4 Submittals

Refer to Section 09900, Paragraph 1.5
1.5  **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 will 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 will 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 will 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  23220 DC 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 will be accepted if proven to be equal or better than the system specified in this section.

<table>
<thead>
<tr>
<th>Coating</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>90-97 Tneme-Zinc:</td>
<td>A two-component moisture cured urethane primer</td>
</tr>
<tr>
<td>Zinc-Rich organic</td>
<td></td>
</tr>
<tr>
<td>moisture cured</td>
<td></td>
</tr>
</tbody>
</table>

05/2005               09010-3
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 75°F

To touch: 1 hour
To handle: 5 hours
To recoat: 12 hours
To resist moisture condensation:

3 to 6 hours

TEMPERATURE RESISTANCE

(Dry) Continuous 170°F. Intermittent 200°F

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
2.5 **Performance Criteria**

This product will 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 1/8-inch steel panels.  
**Surface Preparation:** SSPC-SP10.  
**System:** 90-8 One-Coat 90-97 Tneme-Zinc cured 7 days at 77°F./50% R.H.  
**Requirement:** No less than a rating of 5, average of three trials.

**Salt Spray (Fog)**  
**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 will 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 will be primed the same day they are blast cleaned. Any reblasted that is required will 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 will 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 will conform to all Local, State and Federal specifications, regulations, and laws governing the removal of lead paint. Each site will 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 will 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 will be measured by the square foot or as noted. Measurement will 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 Engineer.
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 will 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 (SSPC)

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 will 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 will 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 will 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 will 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. It is intended, therefore, that the systems be provided by the following manufacturers:

- Koppers Company, Pittsburgh, PA
- Tnemec Company, Inc., Kansas City, MO
- Hughson Chemicals, Lord Corp., Erie, PA
- Wise Chemical Company, Pittsburgh, PA
- Carboline Company, St. Louis, MO
- Pennsbury Coating Corp., Bucks Co., PA

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

<table>
<thead>
<tr>
<th>Coating</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coal Tar - Black</td>
<td>High build coal tar solution containing 65% solids by volume.</td>
</tr>
<tr>
<td>Coal Tar Epoxy-White</td>
<td>High build 2-component white coal tar epoxy coating having a minimum epoxide resin content of 34% by weight in the weight.</td>
</tr>
<tr>
<td>Epoxy - Polyamide</td>
<td>Two component Polyamide epoxy containing 55% solids by volume. With exposure at 45° 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.</td>
</tr>
<tr>
<td>Epoxy-Primer - Red</td>
<td>Two component polyamide epoxy containing a minimum of 53% solids by volume having performance equal to the epoxy-polyamide above.</td>
</tr>
<tr>
<td>Modified Epoxy</td>
<td>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 will exhibit no blistering, softening, or loss of film integrity, or change in color after 1,000 hours.</td>
</tr>
<tr>
<td>Polyurethane Enamel</td>
<td>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.</td>
</tr>
</tbody>
</table>

### 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

PRIMERA
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
PRIMERA
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
PRIMERA
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)
SECTION 09900 PROTECTIVE COATINGS

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 at 75°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 will 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 will 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 will 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.
Complete Streets

The street is where every element of transportation must be addressed and accommodated: pedestrians, transit, bicyclists, motor vehicles, trucks, and parking. It is also where some other aspects of public life take place including displaying cosplay at anime conventions, playing soccer for fun, and hanging out in your front yard.

The Streets Model Element of the MTP provides guidance for achieving a greater balance among modes through the introduction of a street typology diagramed in this report and other policies that promote and enable Complete Streets. Complete Streets provide appropriate facilities to accommodate all intended transportation users and also take into account the role and character of the street as part of the larger connected network within the urban area.

Complete Streets have three areas of activity: context, pedestrian space, and the roadway. The context of a street includes the buildings and sites adjacent to the street, or right-of-way. Land use in the area adjacent to the street affects the character of the street, such as what is closest to the sidewalk. For example, a railroad station on the opposite side of the street may indicate an area of less activity because of the rail noise. This is clearly seen between the building faces, or front of the private property, and the roadway. The thoroughfare encompasses that portion of the public right-of-way between the sides that is dedicated partially or exclusively to travel.

Arlington seeks to enhance the street network by discouraging the closure of existing streets, and encouraging the creation of alleys and new local street solutions, particularly where larger blocks can be broken up, and when parcels can be provided with better access or frontage.

Certain areas identified on this map as locations where the construction of new streets or improvements to existing streets will improve the connectivity of the existing street network in part of the planned development. These corridors are often necessary to support new development or existing businesses, and the development of new streets and public transportation system, and would be designed through city planned development. The Streets Model Element provides additional details.
**State & Federal Roads in Arlington County, VA**

### State Routes

<table>
<thead>
<tr>
<th>Route</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Route 1</td>
<td>Jefferson Davis Highway</td>
</tr>
<tr>
<td>Route 27</td>
<td>Washington Boulevard (Memorial Bridge to Route 50)</td>
</tr>
<tr>
<td>Route 29</td>
<td>Lee Highway</td>
</tr>
<tr>
<td>Route 50</td>
<td>Arlington Boulevard</td>
</tr>
<tr>
<td>Route 110</td>
<td>Jefferson Davis Highway (Rosslyn to Crystal City)</td>
</tr>
<tr>
<td>Route 120</td>
<td>Glebe Road</td>
</tr>
<tr>
<td>Route 123</td>
<td>Chain Bridge Road</td>
</tr>
<tr>
<td>Route 124</td>
<td>Spout Run Parkway (Lee Highway to Lorcom Lane)</td>
</tr>
<tr>
<td>Route 233</td>
<td>Airport Viaduct</td>
</tr>
<tr>
<td>Route 237</td>
<td>Washington Boulevard (N. Glebe Road to Lee Highway)</td>
</tr>
<tr>
<td>Route 237</td>
<td>Fairfax Drive (Kirkwood Road to N. Glebe Road)</td>
</tr>
<tr>
<td>Route 237</td>
<td>10th Street North (Route 50 to Kirkwood Road)</td>
</tr>
<tr>
<td>Route 309</td>
<td>Old Dominion Drive</td>
</tr>
<tr>
<td>I-66</td>
<td>Custis Memorial Parkway</td>
</tr>
<tr>
<td>I-395</td>
<td>Henry G. Shirley Memorial Highway</td>
</tr>
</tbody>
</table>

### Federal Routes

<table>
<thead>
<tr>
<th>Route</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Boundary Channel Drive</td>
</tr>
<tr>
<td></td>
<td>Pentagon Street</td>
</tr>
<tr>
<td></td>
<td>Memorial Avenue</td>
</tr>
<tr>
<td></td>
<td>Marshall Drive (North Meade Street to U.S. Route 110)</td>
</tr>
<tr>
<td></td>
<td>Arlington Hall Street</td>
</tr>
<tr>
<td></td>
<td>Fort Myer streets, including Arlington National Cemetery</td>
</tr>
<tr>
<td></td>
<td>George Washington Parkway (U.S. Park Service)</td>
</tr>
<tr>
<td></td>
<td>Spout Run Parkway (Lorcom Lane to George Washington Memorial Parkway)</td>
</tr>
</tbody>
</table>

MEMORANDUM

Date: April 27, 2012

TO: NOVA District Staff

From: Hari Sripathi, P.E.
Regional Operations Director

Subject: Lane Closures in Nova District

As a follow up to the memorandum issued by Mr. Garrett Moore, Nova District Administrator dated March 23, 2012, enclosed are the additional guidelines for lane closures.

These guidelines are developed based on traffic volumes, comments received from staff and also considering the public tolerance for the lane closures during certain times of the day. It is not practical to develop timelines that fit every project and for every condition. Therefore, these guidelines must be used as a starting point for discussion at the project level. On large scale projects with robust community outreach and TMP, these hours could be extended. If the project staff would like to modify these hours, they must work with NRO TOC staff and get the approval of their functional Assistant District Administrator. If there are any lane reductions (temporary or permanent) during the peak periods (Mon-Fri, 6:00 AM to 9:00 AM and 3:30 PM to 6:30 PM) on roads with more than 10,000 vehicles per day, Regional Operations Director and Public Affairs Manager must be consulted. Also, if there are complete road closures on any road for construction or maintenance work, Regional Operational Director and Public Affairs Manager must be consulted. Any work that is done in residential subdivisions and cul-de-sac streets should be done during the day time hours to avoid night time noise issues.

Please review your existing contracts and discuss the deviations from these hours with your functional Assistant District Administrator.
## INTERSTATE 395 & INTERSTATE 95

### WEEKDAY

<table>
<thead>
<tr>
<th>Segment</th>
<th>Description</th>
<th>Northbound</th>
<th>Southbound</th>
</tr>
</thead>
<tbody>
<tr>
<td>Segment 1</td>
<td>14th St. Bridge to Springfield Interchange</td>
<td>Single-Lane Closures</td>
<td>Single-Lane Closures</td>
</tr>
<tr>
<td></td>
<td></td>
<td>or Shoulder</td>
<td>or Shoulder</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10:00AM to 3:00PM</td>
<td>10:00AM to 3:00PM</td>
</tr>
<tr>
<td></td>
<td></td>
<td>9:00PM to 5:00AM</td>
<td>9:00PM to 5:00AM</td>
</tr>
</tbody>
</table>

| Segment 2 | Springfield Interchange to Rt.123          | Two-Lane Closures   | Two-Lane Closures   |
|          |                                           | 10:00PM to 5:00AM   | 10:00PM to 5:00AM   |
|          |                                           | 11:00PM to 5:00AM   | 11:00PM to 5:00AM   |
|          |                                           | 12:00AM to 5:00AM   | 12:00AM to 5:00AM   |

| Segment 3 | Rt.123 to the end of Prince William County line | Multiple-Lane Closures | Complete Road Closure |
|          |                                                | 10:00PM to 5:00AM   | 12:00AM to 5:00AM   |
|          |                                                | 11:00PM to 5:00AM   | 12:00AM to 5:00AM   |

All lanes open at 12:00 noon on Friday

Reversible HOV (RHOV) Facility

9:30AM to 3:00PM

**Excluding Friday and in coordination with RHOV direction switching**

### INTERSTATE 395 & INTERSTATE 95

| Segment 1 | 14th St. Bridge to Springfield Interchange | Single-Lane Closures | Single-Lane Closures |
|          |                                           | or Shoulder          | or Shoulder          |
|          |                                           | 10:00AM to 2:30PM   | 10:00AM to 3:00PM   |
|          |                                           | 9:30PM to 5:00AM    | 9:30PM to 5:00AM    |

| Segment 2 | Springfield Interchange to Rt.123          | Two-Lane Closures   | Two-Lane Closures   |
|          |                                           | 10:00PM to 5:00AM   | 10:00PM to 5:00AM   |
|          |                                           | 11:00PM to 5:00AM   | 11:00PM to 5:00AM   |
|          |                                           | 12:00AM to 5:00AM   | 12:00AM to 5:00AM   |

| Segment 3 | Rt.123 to the end of Prince William County line | Multiple-Lane Closures | Complete Road Closure |
|          |                                                | 10:00PM to 5:00AM   | 12:00AM to 5:00AM   |
|          |                                                | 11:00PM to 5:00AM   | 12:00AM to 5:00AM   |

All lanes open at 12:00 noon on Friday

Reversible HOV (RHOV) Facility

9:30PM to 5:00AM

**Excluding Friday and in coordination with RHOV direction switching**

### INTERSTATE 495 (BELTWAY)

| Segment 1 | A. L. Bridge to Springfield Interchange | Single-Lane Closures | Single-Lane Closures |
|          |                                           | or Shoulder          | or Shoulder          |
|          |                                           | 10:00AM to 3:00PM   | 10:00AM to 3:00PM   |
|          |                                           | 9:30PM to 5:00AM    | 9:30PM to 5:00AM    |

| Segment 2 | Springfield Interchange to W.W. Bridge     | Two-Lane Closures   | Two-Lane Closures   |
|          |                                           | 10:00PM to 5:00AM   | 10:00PM to 5:00AM   |
|          |                                           | 11:00PM to 5:00AM   | 11:00PM to 5:00AM   |
|          |                                           | 12:00AM to 5:00AM   | 12:00AM to 5:00AM   |

All lanes open at 12:00 noon on Friday

### INTERSTATE 495 (BELTWAY)

| Segment 1 | A. L. Bridge to Springfield Interchange | Single-Lane Closures | Single-Lane Closures |
|          |                                           | or Shoulder          | or Shoulder          |
|          |                                           | 10:00AM to 3:00PM   | 10:00AM to 3:00PM   |
|          |                                           | 9:30PM to 5:00AM    | 9:30PM to 5:00AM    |

| Segment 2 | Springfield Interchange to W.W. Bridge     | Two-Lane Closures   | Two-Lane Closures   |
|          |                                           | 10:00PM to 5:00AM   | 10:00PM to 5:00AM   |
|          |                                           | 11:00PM to 5:00AM   | 11:00PM to 5:00AM   |
|          |                                           | 12:00AM to 5:00AM   | 12:00AM to 5:00AM   |

All lanes open at 12:00 noon on Friday

### INTERSTATE 66

| Segment 1 | Start of Prince William County line to Route 7100 | Single-Lane Closures | Single-Lane Closures |
|          |                                                  | 10:00AM to 3:00PM   | 10:00AM to 3:00PM   |
|          |                                                  | 9:00PM to 5:00AM    | 9:00PM to 5:00AM    |

| Segment 2 | Route 7100 to Beltway                           | Two-Lane Closures   | Two-Lane Closures   |
|          |                                                  | 10:00PM to 5:00AM   | 10:00PM to 5:00AM   |
|          |                                                  | 11:00PM to 5:00AM   | 11:00PM to 5:00AM   |
|          |                                                  | 12:00AM to 5:00AM   | 12:00AM to 5:00AM   |

**Consider opening shoulder lane**

All lanes open at 12:00 noon on Friday

### INTERSTATE 66

| Segment 1 | Start of Prince William County line to Route 7100 | Single-Lane Closures | Single-Lane Closures |
|          |                                                  | 9:30PM to 6:00AM    | 9:30PM to 6:00AM    |
|          |                                                  | 10:30PM to 5:00AM   | 10:30PM to 5:00AM   |

| Segment 2 | Route 7100 to Beltway                           | Two-Lane Closures   | Two-Lane Closures   |
|          |                                                  | 10:00PM to 5:00AM   | 10:00PM to 5:00AM   |
|          |                                                  | 11:00PM to 5:00AM   | 11:00PM to 5:00AM   |
|          |                                                  | 12:00AM to 5:00AM   | 12:00AM to 5:00AM   |

**Consider opening shoulder lane**

All lanes open at 12:00 noon on Friday

### Inner Loop

### Outer Loop

### Eastbound

### Westbound

*Single-lane closures are only permitted for multiple-lane roadways
**Where Applicable*
<table>
<thead>
<tr>
<th><strong>WEEKEND</strong></th>
<th>Lane closure is only allowed during night time periods as defined in table below</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>INTERSTATE 395 &amp; INTERSTATE 95</strong></td>
<td><strong>Northbound/Southbound</strong></td>
</tr>
<tr>
<td><em><em>Single-Lane Closures</em> or Shoulder</em>*</td>
<td><strong>Multiple-Lane Closures</strong></td>
</tr>
<tr>
<td>Friday to Saturday</td>
<td>10:00PM to 9:00AM</td>
</tr>
<tr>
<td>Saturday to Sunday</td>
<td>10:00PM to 9:00AM</td>
</tr>
<tr>
<td>Sunday to Monday</td>
<td>10:00PM to 5:00AM</td>
</tr>
<tr>
<td>Reversible HOV (RHOV) Facility</td>
<td>11:00PM to 9:00AM (Friday to Saturday and Saturday to Sunday)</td>
</tr>
<tr>
<td><strong>INTERSTATE 495 (BELTWAY)</strong></td>
<td><strong>Inner/Outer Loop</strong></td>
</tr>
<tr>
<td><em><em>Single-Lane Closures</em> or Shoulder</em>*</td>
<td><strong>Multiple-Lane Closures</strong></td>
</tr>
<tr>
<td>Friday to Saturday</td>
<td>10:00PM to 8:00AM</td>
</tr>
<tr>
<td>Saturday to Sunday</td>
<td>10:00PM to 9:00AM</td>
</tr>
<tr>
<td>Sunday to Monday</td>
<td>9:30PM to 5:00AM</td>
</tr>
<tr>
<td><strong>INTERSTATE 66</strong></td>
<td><strong>Eastbound/Westbound</strong></td>
</tr>
<tr>
<td><strong>Outside Beltway</strong></td>
<td><em><em>Single-Lane Closures</em> or Shoulder</em>*</td>
</tr>
<tr>
<td>Friday to Saturday</td>
<td>9:00PM to 9:00AM</td>
</tr>
<tr>
<td>Saturday to Sunday</td>
<td>9:00PM to 9:00AM</td>
</tr>
<tr>
<td>Sunday to Monday</td>
<td>8:00PM to 5:00AM</td>
</tr>
<tr>
<td><strong>Inside Beltway</strong></td>
<td><em><em>Single-Lane Closures</em> or Shoulder</em>*</td>
</tr>
<tr>
<td>Friday to Saturday</td>
<td>10:00PM to 6:00AM</td>
</tr>
<tr>
<td>Saturday to Sunday</td>
<td>10:00PM to 6:00AM</td>
</tr>
<tr>
<td>Sunday to Monday</td>
<td>9:30PM to 5:00AM</td>
</tr>
</tbody>
</table>

*Single-lane closures are only permitted for multiple-lane roadways.*
### WEEKDAY

<table>
<thead>
<tr>
<th>ARTERIAL</th>
<th>Single-Lane Closures* or Shoulder</th>
<th>Multiple-Lane Closures</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Monday to Thursday</td>
<td>Monday to Thursday</td>
</tr>
<tr>
<td>Major Arterials**</td>
<td>9:30AM to 3:00PM</td>
<td>10:00PM to 5:00AM</td>
</tr>
<tr>
<td></td>
<td>10:00PM to 5:00AM</td>
<td>Not allowed until 10:00PM</td>
</tr>
<tr>
<td>All Other Roadways***</td>
<td>9:00AM to 3:30PM</td>
<td>9:00AM to 2:00 PM</td>
</tr>
<tr>
<td></td>
<td>9:00PM to 5:00AM</td>
<td>Not allowed until 10:00PM</td>
</tr>
</tbody>
</table>

*Single-lane closures are only permitted for multiple-lane roadways
**Major Arterials are defined as Primary Roads, high volume Secondary Roads, and all other routes that connect directly to Interstates

### WEEKEND

<table>
<thead>
<tr>
<th>ARTERIAL</th>
<th>Single-Lane Closures* or Shoulder</th>
<th>Multiple-Lane Closures</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Friday to Saturday</td>
<td>Saturday to Sunday</td>
</tr>
<tr>
<td></td>
<td>Saturday to Sunday</td>
<td>Sunday to Monday</td>
</tr>
<tr>
<td>Major Arterials**</td>
<td>11:00PM to 5:00AM</td>
<td>11:00PM to 6:00AM</td>
</tr>
<tr>
<td></td>
<td>10:00PM to 6:00AM</td>
<td>10:00PM to 5:00AM</td>
</tr>
<tr>
<td>All Other Roadways</td>
<td>10:00PM to 9:00AM</td>
<td>10:00PM to 6:00AM</td>
</tr>
</tbody>
</table>

*Single-lane closures are only permitted for multiple-lane roadways
**Major Arterials are defined as Primary Roads, high volume Secondary Roads, and all other routes that connect directly to Interstates
PROJECT: ____________________________
RFI NUMBER: ____________________________
PROJECT NO.: ____________________________

FOR CONTRACTOR ROUTING:
Contractor: ____________________________
Work Category: ____________________________
Transmittal No.: ____________________________
Date: ____________________________

TO □ (County Project Officer)
□ (Consultant)
□ (Other)
□ Action □ Faxed to ____________ □ Emailed □ Mailed Pages ___
□ Action □ Faxed to ____________ □ Emailed □ Mailed Pages ___
□ Action □ Faxed to ____________ □ Emailed Pages ___
□ Action □ Faxed to ____________ □ Emailed Pages ___
□ 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
<table>
<thead>
<tr>
<th>MATERIAL AND TEST (REF. - VDOT TEST METHODS MANUAL)</th>
<th>VDOT ROAD AND BRIDGE SPECIFICATION 2002 (Or Latest Version)</th>
<th>MINIMUM RATE OF SAMPLING (REF. - VDOT MANUAL OF INSTRUCTIONS)</th>
<th>LOCATION OF SAMPLING</th>
<th>REMARKS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SOILS AND AGGREGATES</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>1. Embankments</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(a) Density, Any Method</td>
<td>303.04(h)</td>
<td>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.</td>
<td>Roadway</td>
<td>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.</td>
</tr>
<tr>
<td><strong>2. Finished Sub-grade (Both Cut and Fill Sections)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(a) Density, Any Method</td>
<td>305.03</td>
<td>One (1) test per 2000 continuous linear ft. of roadway and one test minimum per intersection per construction location</td>
<td>Roadway (24 ft.)</td>
<td>For nuclear test, use Direct Transmission Method, VTM-10. See Notes 1 and 2.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>MATERIAL AND TEST (REF. - VDOT TEST METHODS MANUAL)</th>
<th>VDOT ROAD AND BRIDGE SPECIFICATION 2002 (Or Latest Version)</th>
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<th>LOCATION OF SAMPLING</th>
<th>REMARKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>(b) Density, Any Method</td>
<td>305.03</td>
<td>One (1) test per continuous section/block/or intersection</td>
<td>Curb, Comb. Curb and Gutter</td>
<td>For nuclear test, use Direct Transmission Method, VTM-10. See Notes 1 and 2.</td>
</tr>
<tr>
<td>(c) Density, Any Method</td>
<td>305.03</td>
<td>One (1) test per continuous section/block/or intersection</td>
<td>Sidewalk</td>
<td>For nuclear test, use Direct Transmission Method, VTM-10. See Notes 1 and 2.</td>
</tr>
<tr>
<td>3. Central Mix Aggregate (Treated or Untreated) Base, Subbase, and Select Material</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(a) Density, Any Method</td>
<td>305.03, 308.03, &amp; 309.05,</td>
<td>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.</td>
<td>Roadway. Location of five (5) nuclear readings at randomly selected sites.</td>
<td>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.</td>
</tr>
<tr>
<td>(b) Density, Any Method</td>
<td>305.03, 308.03, &amp; 309.05,</td>
<td>One (1) test per continuous section/block/or intersection</td>
<td>Curb, Comb. Curb and Gutter</td>
<td>For nuclear test, use Direct Transmission Method, VTM-10. See Notes 1 and 2.</td>
</tr>
</tbody>
</table>
### MATERIAL AND TEST (REF. - VDOT TEST METHODS MANUAL)

<table>
<thead>
<tr>
<th>MATERIAL AND TEST (REF. - VDOT TEST METHODS MANUAL)</th>
<th>VDOT ROAD AND BRIDGE SPECIFICATION 2002 (Or Latest Version)</th>
<th>MINIMUM RATE OF SAMPLING (REF. - VDOT MANUAL OF INSTRUCTIONS)</th>
<th>LOCATION OF SAMPLING</th>
<th>REMARKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>(c) Density, Any Method</td>
<td>305.03, 308.03, &amp; 309.05,</td>
<td>One (1) test per continuous section/block/or intersection</td>
<td>Sidewalk</td>
<td>For nuclear test, use Direct Transmission Method, VTM-10. See Notes 1 and 2.</td>
</tr>
<tr>
<td>4. Backfill for Pipes and Box Culverts</td>
<td>302.03, 303.04(g), 401.03(i)</td>
<td>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. For rate of testing greater than 1” above top of pipe refer to contract documents and Rate of Sampling for embankments. (See Appendix A)</td>
<td>Alternating sides of structure</td>
<td>For nuclear test, use Direct Transmission Methods, VTM-10. See Notes 1 and 2 for reports. Backfill lifts shall be compacted in horizontal layers not more than 6 inches in thickness, loose measurement. (Or as Specified by the Contract Documents)</td>
</tr>
<tr>
<td>5. Backfill for Drop Inlets</td>
<td>302.03, 303.04(g)</td>
<td>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. (See Appendix B)</td>
<td>Perimeter of structure</td>
<td>To include drop inlets, junction boxes, etc. For nuclear test, use Direct Transmission Methods, VTM-10. See Notes 1 and 2 for reports. Backfill lifts shall be compacted in horizontal layers not more than 6 inches in thickness, loose measurement. (Or as Specified by the Contract Documents)</td>
</tr>
<tr>
<td>6. Backfill for Manholes</td>
<td>302.03, 303.04(g)</td>
<td>Minimum one test every other lift around the perimeter beginning after the first 4”</td>
<td>Perimeter of structure</td>
<td>For nuclear test, use Direct Transmission Methods, VTM-10. See Notes 1 and 2 for reports.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>MATERIAL AND TEST (REF. - VDOT TEST METHODS MANUAL)</th>
<th>VDOT ROAD AND BRIDGE SPECIFICATION 2002 (Or Latest Version)</th>
<th>MINIMUM RATE OF SAMPLING (REF. - VDOT MANUAL OF INSTRUCTIONS)</th>
<th>LOCATION OF SAMPLING</th>
<th>REMARKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Backfill lifts shall be compacted in horizontal layers not more than 6 inches in thickness, loose measurement. (Or as Specified by the Contract Documents)</td>
<td>compacted layer above the bedding and continue to top of the structure. Stagger tests to ensure consistent compaction effort has been achieved. (See Appendix B)</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

### HYDRAULIC CEMENT CONCRETE

<table>
<thead>
<tr>
<th>1. Sidewalk, Curb, Comb. Curb and Gutter</th>
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</tr>
</thead>
<tbody>
<tr>
<td><em>(a) Temperature Measurements</em> 217</td>
<td>One test per batch (truck), and when making compressive specimens.</td>
<td>At job site, and prior to placing concrete in forms.</td>
<td>If test on any batch fails, recheck batch immediately before rejecting. Enter results of tests in project records.</td>
<td></td>
</tr>
</tbody>
</table>

<p>| <em>(b) Air Content</em> 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. |</p>
<table>
<thead>
<tr>
<th>MATERIAL AND TEST (REF. - VDOT TEST METHODS MANUAL)</th>
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<tr>
<td>(c) Consistency (Slump Test).</td>
<td>217</td>
<td>One test per batch (truck), and when making compressive specimens.</td>
<td>At job site, and prior to placing concrete in forms.</td>
<td>If test on any batch fails, recheck batch immediately before rejecting. Enter results in project records.</td>
</tr>
</tbody>
</table>
| (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. | 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°F to 80°F, and prevent loss of moisture.
Testing
Except when high-early strength concrete is specified, compressive strength testing will be performed at 28 days. |

**ASPHALT PAVEMENT**
<table>
<thead>
<tr>
<th>MATERIAL AND TEST (REF. - VDOT Test Methods Manual)</th>
<th>VDOT ROAD AND BRIDGE SPECIFICATION 2002 (Or Latest Version)</th>
<th>MINIMUM RATE OF SAMPLING (REF. - VDOT Manual of Instructions)</th>
<th>LOCATION OF SAMPLING</th>
<th>REMARKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) In-place Pavement Density by Nuclear Method</td>
<td>Roads and Bridges Section 315.05 VTM-76 AASHTO T-166</td>
<td>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</td>
<td>Field</td>
<td>Contractor/Asphalt Producer shall provide Certified Asphalt Paving Technician for density testing</td>
</tr>
<tr>
<td>(2) In-place Pavement Density by Nuclear Method and/or VDOT cores (Test Section) (Asphalt Pavement)</td>
<td>Roads and Bridges Section 315.05 VTM-76 AASHTO T-166</td>
<td>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</td>
<td>Field</td>
<td>Contractor/Asphalt Producer shall provide Certified Asphalt Paving Technician for density testing</td>
</tr>
<tr>
<td>(3) Temperature Measurements</td>
<td>Roads and Bridges 211.08</td>
<td>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 Concrete Technician. If any test QC - Processing or mixing plant from back of truck QA – Field</td>
<td>Contractor/Asphalt Producer shall provide Certified Asphalt Paving Technician for density testing</td>
<td></td>
</tr>
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<td>MATERIAL AND TEST (REF. - VDOT TEST METHODS MANUAL)</td>
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<td>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.</td>
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<td></td>
</tr>
</tbody>
</table>
