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

CONTRACT AWARD COVERPAGE

TO: MILANI CONSTRUCTION, LLC
2001 MLK JR. AVENUE, SE
WASHINGTON, DC 20020

DATE ISSUED: 5/25/2023
CONTRACT NO: 23-DES-ITBPW-502
CONTRACT TITLE: SHIRLINGTON ROAD PEDESTRIAN BRIDGE

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.

The contract documents consist of the terms and conditions of AGREEMENT No. 23-DES-ITBPW-501, including any attachments or amendments thereto.

EFFECTIVE DATE: MAY 16, 2023
EXPIRES: 365 CALENDAR DAYS FOR SUBSTANTIAL COMPLETION AFTER NOTICE TO PROCEED
RENEWALS: THERE ARE NO RENEWALS AVAILABLE
COMMODITY CODE(S): 91313
LIVING WAGE: N

ATTACHMENTS:
AGREEMENT No. 23-DES-ITBPW-502

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

VENDOR CONTACT: SAEED MILANI-NIA
VENDOR TEL. NO.: (202) 610-9856
EMAIL ADDRESS: ESTIMATING@MILANICONSTRUCTION.NET
COUNTY CONTACT: ZORAN DRAGACEVAC, DES, TRANSPORTATION
COUNTY TEL. NO.: (703) 228-6509
COUNTY CONTACT EMAIL: ZDRAGACEVAC@ARLINGTONVA.US

PURCHASING DIVISION AUTHORIZATION

Kaylin Schreiber ____ Title: Procurement Officer_____ Date: 4/28/2023__

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

AGREEMENT NO. 23-DES-ITBPW-502

THIS AGREEMENT is made, on 5/25/2023, between Milani Construction, LLC, 2001 MLK Jr. Avenue, SE, Washington, DC 20020 ("Contractor") a Washington, DC limited liability company 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. 23-DES-ITBPW-502 and all modifications properly incorporated into the Agreement
- Exhibit A – Arlington County Invitation to Bid No. 23-DES-ITBPW-502, including DES General Conditions, incorporated by reference
- Exhibit B – Virginia Department Of Labor And Industry Wage Determination Decision
- Exhibit C – Price Bid of Contractor
- Exhibit D – Contractor Performance Evaluation Form
- Exhibit E – Special Conditions
- Exhibit F – Geotechnical Report
- Exhibit G – Construction Drawings
- Exhibit H – Arlington County Master Transportation Plan
- Exhibit I – Arlington County Materials Testing Specification Reference
- Exhibit J – VDOT Lane Closure Guidelines
- Exhibit K – State and Federal Roads in Arlington County, VA
- Exhibit L – County RFI Form Template

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

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

2. SCOPE OF WORK

The Contractor will furnish all labor, materials, and equipment for the construction of the Shirlington Road Pedestrian Bridge project, which includes building a new bicycle and pedestrian prefabricated bridge across Four Mile Run to provide for an effective and safe bicycle and pedestrian access. The other improvements include new streetlighting, median, sidewalk and crosswalk retrofits, as well as a new Rectangular Rapid Flashing Beacon (RRFB). (the "Project") and all other work shown, described, and required by the Contract Documents (hereinafter "the Work").

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

3. PROJECT OFFICER

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

4. TIME FOR COMPLETION

Work under this Agreement shall achieve Substantial Completion no later than three hundred sixty-five (365) consecutive calendar days after the commencement date given in a Notice to Proceed provided by the County to the Contractor, subject to any modifications made as provided for in the Contract Documents. This three hundred sixty-five (365) day period shall be the Period of Performance for Substantial Completion. No Work shall be deemed Substantially Complete until it meets the requirements of Substantial Completion set forth in the General Conditions. Final Completion of the Work shall be completed no later than thirty (3) calendar days after the date of acceptance of Substantial Completion by the County Project Officer. Work will not reach Final Completion until it meets the requirements set forth in the General Conditions.

Unless otherwise provided, no claims for early completion are allowed.

5. CONTRACT AMOUNT

The County will pay the Contractor in accordance with the terms of the Progress Payments and Payment Terms sections below and at the prices shown in Exhibit C, but not more than $1,384,238.50 for the Contractor's completion of the Work as required by the Contract Documents provided the Work is performed to the satisfaction of and is accepted by the Project Officer. The Contractor will complete the Work for the total amount specified in this section ("Contract Amount") unless such amount is modified as provided in this Agreement. The Contract Amount includes all of the Contractor's costs and fees (profit) and is inclusive of all anticipated or known site conditions, anticipated or known materials, labor, and equipment costs, or any other costs which should reasonably have been expected by the Contract Documents.

6. PROGRESS PAYMENTS

The County will make monthly progress payments to the Contractor upon written application by the Contractor, on the basis of a written estimate of the work performed during the preceding calendar month as approved by the Project Officer.

All material and work covered by partial payments will become the property solely of the County at the time the partial payment is made. However, the Contractor will have the sole responsibility, care and custody for all materials and work upon which payments have been made until Substantial Completion. When calculating payment for materials on-site, the County shall not pay for materials which are not scheduled for incorporation into the Work within sixty (60) days from the date of application for payment.

7. PAYMENT TERMS

The Contractor must submit invoices to the County's Project Officer, who will either approve the invoice or require corrections. The County will pay the Contractor 45 days after approval of an invoice for completed work which is reasonable and allocable to the Contract. All payments will be made from the County to the Contractor via ACH. The number of the County Purchase Order pursuant to work has been performed must appear on all invoices.

8. PAYMENT OF SUBCONTRACTORS

The Contractor is wholly responsible for the entire amount owed to any subcontractor with which the Contractor contracts in the performance of this Agreement, regardless of whether the Contractor has received payment from the County. The Contractor is not liable for amounts that are not owed as a result of the subcontractor's breach of its agreement with the Contractor, in which case the Contractor must notify the subcontractor in writing of its intention to withhold payment, in full or in part, and the reason for doing so.

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

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

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

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

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

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

9. PREVAILING WAGE CONTRACT REQUIREMENTS

A. Section 4-104 of the Arlington County Purchasing Resolution (regarding "Prevailing Wage) applies to this Contract. All employees of the Contractor and any subcontractors shall be paid

wages, salaries, benefits, and other remuneration at or above the craft or trade category prevailing wage rate indicated by Virginia Commissioner of Labor and Industry (DOLI) and as listed in the contract.

The Contractor and its subcontractors shall submit all certified payrolls and statements of compliance weekly through the eComply website. If the Contractor or any subcontractor does not have an eComply profile, a one-time registration process immediately following the Notice of Award or Notice of Intent to Award and training on system functionality are required for each non-registered entity. The Contractor shall also be responsible for reviewing subcontractor payrolls and ensuring that contract requirements are met.

In addition to applying the prevailing wage rates to its own employees, the Contractor shall include the provisions of this Article 4-104 in every subcontract so that such provisions will be binding upon each subcontractor. The Contractor agrees to assume the obligation that the wage requirements will be observed in fulfilling the requirements of the Contract. The appropriate enforcement sanctions will be invoked against the Contractor and any such subcontractor in the event of such subcontractor's failure to comply with any of the provisions of this Article 4-104.

All wage rates to be used are listed in this Contract in Exhibit B. While DOLI maintains a list of wage determinations online for reference purposes, only the wage determinations made in an official Wage Determination Decision, sent by DOLI to Arlington County, can be used to ascertain the exact rates to be paid for this Contract.

All rates are determined by DOLI and any appeals of specific classification may be made through the Wage Determination Appeal form available at http://www.doli.virginia.gov/wp-content/uploads/2021/04/Appeal-for-Wage-Determination-Clarification.pdf.

B. Upon award of the Contract, the Contractor shall certify, under oath, to the Virginia Commissioner of Labor and Industry and to the County Prevailing Wage Compliance Manager, the pay scale for each craft and trade to be employed for, or to provide labor for, in the Work by the Contractor and any subcontractors. The Contractor's certification shall include all information required by the Code of Virginia § 2.2-4321.3G.

C. The Contractor shall ensure that each individual providing labor as a mechanic, laborer, worker or equivalent shall be accurately classified in confirmation with the Wage Determination.

D. The Contractor shall post the prevailing wage rate for each craft and classification involved as determined by DOLI, including the effective date, in a prominent and easily accessible place at the work site during the time work is being performed. The posting must be in English and any other language that is primarily spoken by the individuals at the work site. Within 10 days of such posting the Contractor shall certify to the County Prevailing Wage Compliance Manager and DOLI its compliance with this subsection at https://www.doli.virginia.gov/wp-content/uploads/2021/04/PW_Posting_Compliance_Form.pdf;

E. The Contractor must fully cooperate with the County Prevailing Wage Compliance Manager to ensure contract compliance requirements ,including but not limited to site visits, wage rate signage, contractor employee interviews, and the submission of certified payroll records.

F. The Contractor must submit to the County Prevailing Wage Compliance Manager and DOLI, within five (5) working days of the end of each month, certification for each craft or trade employed on the project, specifying the total hourly amount paid to employees, including wages and applicable fringe benefits using the Pay Scale Certification Form at https://www.doli.virginia.gov/wp-content/uploads/2021/04/DOLI-Pay-Scale-Certification-for-Public-Works-Projects.pdf. The certification must itemize the amount paid in wages and each applicable benefit and list the names and addresses of any third party fund, plan or program to which benefit payments will be made on behalf of employees.

G. The Contractor shall indemnify and hold harmless the County from any fines, demands, claims, suits, and damages, including attorney's fees, resulting from the Contractor's or any subcontractor's failure to pay the Prevailing Wage.

H. The Contractor and its subcontractors shall keep, maintain, and preserve (i) records relating to the wages paid to and hours worked by each individual performing the work of any mechanic, laborer, or worker; and (ii) a schedule of the occupation or work classification at which each individual performing the work of any mechanic, laborer, or worker on the construction project is employed each work day and week. The Contractor and its subcontractors shall make such records available to the Prevailing Wage Compliance Manager within 10 days of a request or per a regular schedule established in the Contract, and shall certify that records reflect the actual hours worked and the amount paid to its workers for whatever time period is requested. The Contractor and its subcontractors must preserve these records for a period of six (6) years after the expiration or earlier termination of the applicable contract.

I. Any Contractor or subcontractor who pays any mechanic, laborer, or worker for services under this Contract less than the Prevailing Wage shall be liable to such individuals for the payment of all wages due, plus interest at an annual rate of eight percent (8%) from the dates wages were due; and shall be disqualified from bidding on public contracts with any public body until the Contractor or subcontractor has made full restitution. A willful violation of Article 4-104 is a Class I misdemeanor.

J. For questions regarding Prevailing Wage, please email prevailingwage@arlingtonva.us.

10. RELEASE AND REQUEST FOR FINAL PAYMENT

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

11. LIQUIDATED DAMAGES

Time is of the essence under this Contract. The Work must be completed within the Time for Completion. The County and the Contractor agree that damages for failure to achieve Substantial Completion of the Work by the date specified under Time for Completion are not susceptible to exact determination but that $1,817.50 per calendar day is in proportion to the actual loss that the County would suffer from such delay. Therefore, the Contractor will pay the County as liquidated damages $1,817.50 per day for each and every day beyond the time for Substantial Completion that the County determines Substantial Completion has not achieved. The County and the Contractor also agree that damages for failure to achieve Final Completion of the Work by the date specified under Time for Completion are not susceptible

to exact determination but that $1,817.50 per calendar day is in proportion to the actual loss the County would suffer from such delay. Therefore, the Contractor will pay the County as liquidated damages $1,817.50 per day for each and every day beyond the time for Final Completion until Final Completion is achieved.

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

12. PERFORMANCE OF WORK BY THE CONTRACTOR

The Contractor shall perform on site, and with its own organization, at least fifty percent (50%) of the total direct labor and at least eighty percent (80%) of the total work in place to be performed under the Contract. Prior to award, the Contractor must demonstrate to the Project Officer's satisfaction that both of these standards will be met during contract performance. Labor and work to be counted when determining whether the Contractor has met the self-performance requirement shall not include any work that the Contractor performs under the supervision of a subcontractor.

The self-performance percentage may be reduced by an Amendment to the Contract, if during performance of the Work, the Contractor requests a reduction and the Project Officer determines that the reduction would be to the advantage of the County.

13. NON-APPROPRIATION

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

14. ESTIMATED QUANTITIES/NON-EXCLUSIVITY OF CONTRACTOR

This Contract does not obligate the County to purchase a specific quantity of items or services during Contract Term. Any quantities that are included in the Contract Documents are the present expectations of the County for the period of the Contract; and the County is under no obligation to buy that 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 County may require more goods and/or services than the estimated annual quantities, and any such additional quantities will not give rise to any claim for compensation other than at the unit prices and/or rates in the Contract.

The County does not guarantee that the Contractor will be the exclusive provider of the goods or services covered by this Contract. The items or services covered by this Contract may be or become available under other County contract(s), and the County may determine that it is in its best interest to procure the items or services through those contract(s).

15. COUNTY PURCHASE ORDER REQUIREMENT

County purchases are authorized only if the County issues a Purchase Order in advance of the transaction, indicating that the ordering County agency has sufficient funds available to pay for the purchase. If the Contractor provides goods or services without a signed County Purchase Order, it does so at its own risk

and expense. The County will not be liable for payment for any purchases made by its employees that are not authorized by the County Purchasing Agent.

16. LIEN

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

17. VALUE ENGINEERING PROPOSAL (VE)

Unless otherwise provided, the Contractor may submit to the County a written VE for modifying the plans, specifications, or other requirements of the Agreement covering the work (Contract) for the purpose of reducing the total cost of the Contract without reducing the design capacity or quality of the finished product. If the VEP is accepted by the County, the net savings will be equally divided by the County and the Contractor.

Each VEP shall result in a net savings over the Contract cost without impairing essential functions and characteristics of the item(s) or of any other part of the project, including, but not limited to, service life, reliability, economy of operation, ease of maintenance, aesthetics, and safety. At least the following information shall be submitted with each VE:

(a) a statement that the proposal is submitted as a VE;

(b) a statement concerning the basis for the VE, benefits to the County, and an itemization of the Contract items and requirements affected by the VE;

(c) a detailed estimate of the cost under the existing Contract and under the VE;

(d) proposed specifications and recommendations as to the manner in which the VE changes are to be accomplished; and

(e) a statement as to the time by which a Contract Amendment adopting the VE must be issued so as to obtain the maximum cost-effectiveness.

The County will process the VE in the same manner as prescribed for any other proposal that would necessitate issuance of an Amendment. The County may accept a VE in whole or part by issuing an Amendment that will identify the VE on which it is based. The County will not be liable to the Contractor for failure to accept or act on any VE submitted pursuant to these requirements or for delays in the work attributable to any VE. Until a VE is put into effect by an Amendment, the Contractor shall remain obligated to the terms and conditions of the existing Agreement. If an executed Amendment has not been issued by the date on which the Contractor's proposal specifies that a decision should be made or such other date as the Contractor may subsequently have specified in writing, the VE shall be deemed rejected.

The Amendment effecting the necessary modification of the Contract will establish the net savings agreed on, provide for adjustment of the contract prices, and indicate the net savings. The Contractor shall absorb all costs incurred in preparing a VE. Reasonably incurred costs for reviewing and administering a VE will be borne by the County. The County may establish any reasonable conditions it deems appropriate for consideration, approval, and implementation of the VE. The Contractor's 50 percent share of the net

savings shall constitute full compensation to it, including by way of illustration and not limitation compensation for time, for effecting all changes pursuant to the Amendment.
Unless specifically provided for in the Amendment authorizing the VE, acceptance of the VE and performance of the work thereunder will not change the Contract Term limit.

The County may adopt a VE for general use in contracts administered by the County if it determines that the VE is suitable for application to other contracts. A VE identical with or similar to a previously submitted VE will be eligible for consideration and compensation under these provisions if it has not been previously adopted for general application to other contracts administered by the County. When a VE is adopted for general use, compensation pursuant to these requirements will be applied only to those awarded contracts for which the VE was submitted prior to the date of adoption of the VE.

If a VEP is based on or is similar to a change in the plans, specifications, or special provisions adopted by the County prior to submission of the VE, as determined by the County, the County will not accept the VE.

The County will be the sole judge of the acceptability of a VE. The requirements herein apply to each VE initiated, developed, and identified as such by the Contractor at the time of its submission to the County. However, nothing herein shall be construed as requiring the County to consider or approve a VE, and the decision to enter into an Amendment to the contract to accommodate a VE shall be in the County's sole discretion.

Subject to the provisions contained herein, the County, or any other public agency with the County's permission, shall have the right to use all or part of an accepted VE without obligation or compensation of any kind to the Contractor.

If a VE is accepted by the County, any provisions herein that pertain to the adjustment of contract unit prices attributable to alterations of contract quantities will not apply to the items adjusted or deleted as a result of putting the VE into effect by an Amendment.

18. EMPLOYMENT DISCRIMINATION BY CONTRACTOR PROHIBITED

During the performance of its work pursuant to this Contract:

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

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

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

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

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

19. EMPLOYMENT OF UNAUTHORIZED ALIENS PROHIBITED

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

20. DRUG-FREE WORKPLACE TO BE MAINTAINED BY CONTRACTOR

During the performance of this Contract, the Contractor must: (i) provide a drug-free workplace for its employees; (ii) post in conspicuous places, available to employees and applicants for employment, a statement notifying employees that the unlawful manufacture, sale, distribution, dispensation, possession, or use of a controlled substance or marijuana is prohibited in the Contractor's workplace and specifying the actions that will be taken against employees for violating such prohibition; (iii) state in all solicitations or advertisements for employees placed by or on behalf of the Contractor that the Contractor maintains a drug-free workplace; and (iv) include the provisions of the foregoing clauses in every subcontract or purchase order of more than $10,000.00 relating to this Contract so that the provisions will be binding upon each subcontractor or vendor.

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

21. SEXUAL HARASSMENT POLICY

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

22. COVID-19 VACCINATION POLICY FOR CONTRACTORS

Due to the ongoing COVID-19 pandemic, the County has taken various steps to protect the welfare, health, safety, and comfort of the workforce and public at large. As part of these steps, the County has implemented various requirements with respect to health and safety including policies with respect to social distancing, the use of face-coverings and vaccine mandates. To protect the County's workforce and the public at large, all employees and subcontractors of the Contractor who are assigned to this Contract, should be fully vaccinated against COVID-19. Any contractor employee or subcontractor who is not fully vaccinated should be following a weekly testing protocol as established by the Contractor, unless exempt pursuant to a valid reasonable accommodation under state or federal law.

23. PROJECT STAFF

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

24. FAILURE TO DELIVER

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

25. UNSATISFACTORY WORK

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

26. TERMINATION

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

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

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

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

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

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

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

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

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

B. TERMINATION FOR THE CONVENIENCE OF THE COUNTY

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

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

27. INDEMNIFICATION

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

28. INTELLECTUAL PROPERTY INDEMNIFICATION

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

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

29. COPYRIGHT

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

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

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

30. OWNERSHIP AND RETURN OF RECORDS

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

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

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

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

31. CONFIDENTIAL INFORMATION

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

32. ETHICS IN PUBLIC CONTRACTING

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

33. COUNTY EMPLOYEES

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

34. FORCE MAJEURE

Neither party will be held responsible for failure to perform the duties and responsibilities imposed by this Contract if such failure is due to a fire, riot, rebellion, natural disaster, war, act of terrorism or act of God that is beyond the control of the party and that makes performance impossible or illegal, unless otherwise specified in the Contract, provided that the affected party gives notice to the other party as soon as practicable after the force majeure event, including reasonable detail and the expected duration of the event's effect on the party.

35. AUTHORITY TO TRANSACT BUSINESS

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

36. RELATION TO THE COUNTY

The Contractor is an independent contractor, and neither the Contractor nor its employees or subcontractors will be considered employees, servants or agents of the County. The County will not be responsible for any negligence or other wrongdoing by the Contractor or its employees, servants or agents. The County will not withhold payments to the Contractor for any federal or state unemployment

taxes, federal or state income taxes or Social Security tax or for any other benefits. The County will not provide to the Contractor any insurance coverage or other benefits, including workers' compensation.

37. ANTITRUST

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

38. REPORT STANDARDS

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

Whenever possible, proposals must comply with the following guidelines:

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

39. AUDIT

The Contractor must retain all books, records and other documents related to this Contract for at least five (5) years, unless otherwise specified in the Contract, or such period of time required by the County's funding partner(s), if any, whichever is greater, after the final payment and must allow the County or its authorized agents to examine the documents during this period and during the Contract Term. The Contractor must provide any requested documents to the County for examination within 15 days of the request, at the Contractor's expense. Should the County's examination reveal any overcharging by the Contractor, the Contractor must, within 30 days of County's request, reimburse the County for the overcharges and for the reasonable costs of the County's examination, including, but not limited to, the services of external audit firm and attorney's fees; or the County may deduct the overcharges and examination costs from any amount that the County owes to the Contractor. If the Contractor wishes to destroy or dispose of any records related to this Contract (including confidential records to which the County does not have ready access) within five (5) years after the final payment, unless otherwise specified in the Contract, or such period of time required by the County's funding partner(s), if any, whichever is greater, the Contractor must give the County at least 30 days' notice and must not dispose of the documents if the County objects.

The Purchasing Agent may require the Contractor to demonstrate that it has the necessary facilities, ability, and financial resources to comply with the Contract and furnish the service, material or goods specified herein in a satisfactory manner at any time during the term of this Contract.

40. ASSIGNMENT

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

41. AMENDMENTS

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

42. ARLINGTON COUNTY PURCHASING RESOLUTION AND COUNTY POLICIES

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

43. DISPUTE RESOLUTION

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

44. APPLICABLE LAW, FORUM, VENUE, AND JURISDICTION

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

45. ARBITRATION

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

46. NONEXCLUSIVITY OF REMEDIES

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

47. NO WAIVER

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

48. SEVERABILITY

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

49. ATTORNEY'S FEES

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

50. SURVIVAL OF TERMS

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

51. HEADINGS

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

52. AMBIGUITIES

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

53. NOTICES

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

TO THE CONTRACTOR:
Saeed Milani-Nia, President
Milani Construction, LLC
2001 MLK Jr. Avenue, SE
Washington, DC 20020
Phone: (202) 610-9856
Email: estimating@milaniconstruction.net

TO THE COUNTY:

Zoran Dragacevac, Project Officer
Arlington County, Virginia
2100 Clarendon Boulevard, Suite 813
Arlington, Virginia 22201
Phone: (703) 228-6509
Email: zdragacevac@arlingtonva.us

AND

Dr. Sharon T. Lewis, LL.M, MPS, VCO, CPPB
Purchasing Agent
Arlington County, Virginia
2100 Clarendon Boulevard, Suite 500
Arlington, Virginia 22201
Phone: (703) 228-3294
Email: slewis1@arlingtonva.us

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

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

54. NON-DISCRIMINATION NOTICE

Arlington County does not discriminate against faith-based organizations.

55. INSURANCE, PAYMENT AND PERFORMANCE BONDS

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

56. MATERIAL CHANGES

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

57. CONTRACTOR PERFORMANCE

Arlington County will perform written evaluations of the Contractor's performance at various intervals throughout the term of this Contract. The evaluations will address, at a minimum, the Contractor's work/performance, quality, cost controls, schedule, timeliness and sub-contractor management. The Project Officer shall be responsible for completing the evaluations and providing a copy to the Contractor and County Procurement Officer.

58. COUNTERPARTS

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

WITNESS these signatures:

THE COUNTY BOARD OF ARLINGTON COUNTY, VIRGINIA

AUTHORIZED SIGNATURE: DocuSigned by: Kaylin Schreiber 2513E5602A3A4DE...

NAME: Kaylin Schreiber

TITLE: Procurement Officer

DATE: 5/25/2023

MILANI CONSTRUCTION, LLC

AUTHORIZED SIGNATURE: DocuSigned by: Saeed Milani-nia 56A2DFFD0C404E9...

NAME: Saeed Milani-nia

TITLE: President

DATE: 5/25/2023

EXHIBIT B

COMMONWEALTH of VIRGINIA
DEPARTMENT OF LABOR AND INDUSTRY

Gary G. Pan
COMMISSIONER

Main Street Centre
600 East Main Street, Suite 207
Richmond, Virginia 23219
PHONE (804) 371-2327
FAX (804) 371-6524

Virginia Department of Labor and Industry Wage Determination Decision

Project Name	Shirlington Pedestrian Bridge
County Project Code	23-DES-ITBPW-502
DOLI Project Number	ARLC-23-0004 UPDATE
County or Independent City	Arlington County
Publication Date	04/26/2023
Construction Type	Highway

Wage Determinations	Wage	Fringe
Carpenter, Includes Form Work	$20.97	
Cement Mason/Concrete Finisher	$20.70	$8.03
Electrician, Includes Traffic Signalization	$30.55	$11.51
Fence Erector	$15.28	
Ironworker, Reinforcing	$34.18	
Ironworker, Structural	$34.18	
Laborer: Asphalt, Includes Raker, Shoveler, Spreader and Distributor	$19.06	$1.75
Laborer: Common or General	$21.41	$8.11
Laborer: Grade Checker	$14.88	
Laborer: Pipelayer	$20.48	
Laborer: Power Tool Operator	$15.69	
Operator: Asphalt Spreader and Distributor	$20.58	$2.31
Operator: Backhoe/Excavator/Trackhoe	$23.93	

Wage Determinations	Wage	Fringe
Operator: Bobcat/Skid Steer/Skid Loader	$19.00	$3.49
Operator: Broom/Sweeper	$17.40	$2.01
Operator: Bulldozer, Including Utility	$20.64	
Operator: Crane	$29.46	
Operator: Drill	$24.89	
Operator: Gradall	$19.26	
Operator: Grader/Blade	$23.21	
Operator: Hydroseeder	$16.64	
Operator: Loader	$18.92	
Operator: Mechanic	$22.84	
Operator: Milling Machine	$23.19	$2.94
Operator: Pavement Planer	$21.14	
Operator: Pavement Planer Groundsmen	$19.75	
Operator: Paver (Asphalt, Aggregate, and Concrete)	$20.33	$2.81
Operator: Piledriver	$21.83	$4.08
Operator: Roller	$18.92	
Operator: Roller (Finishing)	$18.73	$3.23
Operator: Screed	$22.13	$4.89
Pavement Marking Operator	$22.16	
Pavement Marking Truck Driver	$18.78	
Traffic Control: Flagger	$13.64	
Truck Driver: 1/Single Axle Truck	$19.35	
Truck Driver: Fuel and Lubricant Service	$18.25	
Truck Driver: Heavy 7CY & Under	$15.53	
Truck Driver: Heavy Over 7CY	$18.05	
Truck Driver: Multi Axle	$20.34	$2.89

Additional Notes

All wage rates to be used on a contract will be set at the time the contract is awarded. While DOLI maintains a list of wage determinations online for reference purposes, only the wage determinations made in an official Wage Determination Decision, sent by DOLI to the contracting agency, can be used to ascertain the exact rates to be paid for a specific contract.

All rates are determined by DOLI and any appeals of specific classifications may be made through the Wage Determination Appeal form available at http://www.doli.virginia.gov/wp-content/uploads/2021/04/Appeal-for-Wage-Determination-Clarification.pdf

Any additional classifications may be requested through the Additional Wage Classification form available at http://www.doli.virginia.gov/wp-content/uploads/2021/04/Request-for-Additional-Wage-Classification.pdf
Understand your duties as a contractor under Virginia law by referencing our Contractor Responsibilities information sheet available at http://www.doli.virginia.gov/wp-content/uploads/2021/04/PREVAILING-WAGE-CONTRACTOR-RESPONSIBILITIES.pdf

Your employees have specific rights, which can be found on our List of Employee Rights information sheet available at http://www.doli.virginia.gov/wp-content/uploads/2021/04/PREVAILING-WAGE-EMPLOYEE-RIGHTS.pdf
Any further questions should be directed to PrevailingWage@doli.virginia.gov

BR02 - Shirlington road Pedestrian Bridge
Department of Environmental Services

BID TABULATION

BR02 - Shirlington Road Pedestrian Bridge						
Item Number	Item Code	Pay Item	Quantity	Unit	Unit Price	Subtotal
1	02200-C1-00140	Aggregate, VDOT #21-B (Compacted in Place per VDOT standards & Specs)	50	CY	$145.00	$7,250.00
2	02750-C2-00020	Concrete Curb, Standard Header Curb C-3 (Arlington County Detail R-2.0), includes curb for aprons, ramps, etc.	110	LF	$80.00	$8,800.00
3	02750-C2-00060	Concrete Curb & Gutter, Standard C-2 and C-2R (Arlington County Detail R-2.0), includes curb & gutter for aprons, ramps, etc.	130	LF	$85.00	$11,050.00
4	02611-C2-00110	Concrete Sidewalk, 4" Thickness (Arlington County Detail R-2.0)	180	SY	$150.00	$27,000.00
5	02611-C2-00190	CG-12 Detectable Warning Surface - Truncated Domes	5	SY	$350.00	$1,750.00
6	02600-C3-00010	Asphalt Concrete, Planing or Milling (1/2" to 3" Depth)	285	SY	$25.00	$7,125.00
7	02600-C3-00030	Asphalt Concrete, Base Course (VDOT BM-25.0A)	80	TON	$210.00	$16,800.00
8	02600-C3-00070	Asphalt Concrete, Surface Course (VDOT SM-9.5D)	65	TON	$200.00	$13,000.00
9	02505-C4-00480	Drop Inlet Structure Top, Remove & Replace	1	EA	$2,500.00	$2,500.00
10	05500-C5-00100	Remove existing Guardrail (All types)	65	LF	$10.00	$650.00
11	13160-C8-03001	Traffic Signals and RRFB work	1	LS	$35,000.00	$35,000.00
12	14030-C9-00030	Furnish and Install 2 inch SCH 80 HDPE Direct Bore Conduit (Detail 14030-01)	90	LF	$100.00	$9,000.00
13	14030-C9-00040	Furnish and Install 2 Inch Sch 40 PVC Conduit in Trench (Detail 14030-01)	180	LF	$50.00	$9,000.00
14	14040-C9-00201	Furnish and Install Dominion Energy's Splice Box and Lid	4	EA	$1,500.00	$6,000.00
15	02900-C10-00040	Eighteen (18) Inch Transverse Markings	25	LF	$15.00	$375.00
16	02900-C10-00050	Twenty Four (24) Inch Transverse Markings, Note: Used For Continental (Ladder) Crosswalk	170	LF	$15.00	$2,550.00
17	02900-C10-00070	Four (4) Inch Longitudinal Solid Line	80	LF	$5.00	$400.00
18	02900-C10-00080	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	120	LF	$5.00	$600.00
19	02900-C10-00100	Four (4) Inch Longitudinal Skip Line (Two (2) Foot Line/Ten (10) Foot Spacing), Note: Twelve (12) LF Consists of Two (2) LF of Marking and Ten (10) LF of Space, **Turn Lane Skips**	115	LF	$5.00	$575.00
20	02619-C10-00410	Traffic Control Sign (Typical Stop, Yield, No Parking, Speed Limit, or Similar)	1	EA	$1,000.00	$1,000.00
21	02900-C10-00071	Longitudinal Solid Line - Type A (Paint)	80	LF	$6.50	$520.00
22	02200-C11-00010	Imported Topsoil	10	CY	$140.00	$1,400.00
23	02801-C11-00050	Seed, Mixture of 85% Tall Fescue/Bluegrass and 15% Annual Rye	60	SY	$20.00	$1,200.00
24	02801-C11-00060	Sod, Tall Fescue/Bluegrass Mixture	80	SY	$25.00	$2,000.00
25	02100-C11-00500	Tree/Stump Removal - Class A. Remove and Dispose, Up to 6" DBH to 12" DBH (Diameter at Breast Height)	5	EA	$600.00	$3,000.00

BR02 - Shirlington road Pedestrian Bridge
Department of Environmental Services

BID TABULATION

26	02100-C11-00502	Tree/Stump Removal - Class C. Remove and Dispose, over 18" DBH to 24" DBH (Diameter at Breast Height)	1	EA	$2,250.00	$2,250.00
27	02800-C11-00650	Bare root Tree or Shrub Seedling 12"-24"	90	EA	$26.00	$2,340.00
28	05500-C11-00140	Handrail (Arlington County Detail R-3.1)	70	LF	$285.00	$19,950.00
29	01500-C13-00010	Silt Fence, with Wire Support (Virginia Erosion & Sediment Control Handbook Standard & Specification 3.05)	83	LF	$20.00	$1,660.00
30	01500-C13-00070	Storm Drain Inlet Protection, Block & Gravel Curb Inlet Application (per Virginia Erosion & Sediment Control Handbook Standard & Specification 3.07)	1	EA	$1,000.00	$1,000.00
31	01500-C13-00130	6' Chain Link Tree Protection Fence (per Arlington County DPR Standard 311300.1)	80	LF	$30.00	$2,400.00
32	VDOT Item 27526	Turbidity Curtain (VDOT Pay Item 27526)	232	LF	$50.00	$11,600.00
33	VDOT Item 27430	Siltation Control Excavation (VDOT Pay Item 27430)	20	CY	$200.00	$4,000.00
34	01000-C16-00010	Maintenance of Traffic (MOT)	1	LS	$92,000.00	$92,000.00
35	VDOT Item 62536	Prefabricated Steel Truss Superstructure (VDOT Pay Item 62536)	1	LS	$670,000.00	$670,000.00
36	VDOT Item 68900	Remove Portion of Existing Structure (Str. No. 8900) (VDOT Item 68900)	1	LS	$25,000.00	$25,000.00
37	VDOT Item 65013	Conc. Class A3 (VDOT Item 65013)	41	CY	$1,500.00	$61,500.00
38	VDOT Item 65200	Reinforcing Steel (VDOT Item 65200)	3121	LBS	$3.50	$10,923.50
39	VDOT Item 64112	Steel Piles 12" (VDOT Item 64112)	286	LF	$220.00	$62,920.00
40	VDOT Item 64032	Geocomposite Wall Drain (VDOT Item 64032)	18	SY	$50.00	$900.00
41	VDOT Item 64011	Structure Excavation (VDOT Item 64011)	114	CY	$125.00	$14,250.00
42	VDOT Item 64045	Temporary Sheet Piling (VDOT Item 64045)	1	LS	$1,000.00	$1,000.00
43	VDOT Item 64101	Dynamic Pile Test (Friction Piles) (VDOT Item 64101)	1	EA	$5,000.00	$5,000.00
44	VDOT Item 66239	Riprap, Dry Class II (VDOT Item 66239)	80	TON	$150.00	$12,000.00
45	VDOT Item 67904	Construction Access and Restoration (VDOT Item 67904)	1	LS	$75,000.00	$75,000.00
46	01000-C16-00030	Mobilization and De-Mobilization	1	LS	$135,000.00	$135,000.00
47	01500-SA-00200	SWPPP Administration	1	LS	$5,000.00	$5,000.00

GRAND TOTAL $1,384,238.50

EXHIBIT D

CONTRACTOR PERFORMANCE EVALUATION FORM

ARLINGTON COUNTY GOVERNMENT

Contractor Performance Evaluation Form

Contractor Name:_____ Contract No.: _____

Date:_____ Project/Contract Name: _____

Interim Evaluation____ Final Evaluation _____

Scope of Work/Services Provided:

_____

_____

_____

_____

_____

Contract Start Date: _____/_____/____ Contract End Date: ___/____/____ Actual Completion Date: ___/___/_____

Please rate the effectiveness of the Contractor's performance on the Contract/Project across the following dimensions:

Evaluation Criteria: Unacceptable Poor Satisfactory Excellent

Written comments to explain assigned ratings are required for any performance ratings below "satisfactory" or an "excellent" in any category.

Evaluation Questions

1. Quality of Workmanship

Rate the quality of the Contractor's workmanship. Were there quality-related or workmanship problems on the Contract? Was the Contractor responsive to remedial work required?

____ Unacceptable ____ Poor ____ Satisfactory ____ Excellent ____ N/A

2. Problem Solving and Decision Making

Rate the Contractor's ability to provide effective and creative problem solving, coordination and fair decision making on Contract/Project.

____ Unacceptable ____ Poor ____ Satisfactory ____ Excellent ____ N/A

3. Project Schedule

   Rate the Contractor's performance with regard to adhering to contract schedules. Did the Contractor meet the contract schedule, or the schedule as revised by approved change orders? If not was the delay attributable to the Contractor?

   ____ Unacceptable ____ Poor ____ Satisfactory ____ Excellent ____ N/A

4. Subcontractor Management

   Rate the Contractor's ability, effort and success in managing and coordinating subcontractors (if no subcontractors rate the Contractor's overall project management). Was the Contractor able to effectively resolve problems?

   ____ Unacceptable ____ Poor ____ Satisfactory ____ Excellent ____ N/A

5. Safety

   Rate the Contractor's safety procedures on this Contract/Project? Were there any OHSA violations or serious safety accidents?

   ____ Unacceptable ____ Poor ____ Satisfactory ____ Excellent ____ N/A

6. Environmental Compliance

   Did the Contractor comply with local, state, and federal environmental standards in the performance of the Contract? Did the Contractor comply in good faith with local erosion and sedimentation control requirements and/or any Stormwater Pollution Prevention Plan?

   ____ Unacceptable ____ Poor ____ Satisfactory ____ Excellent ____ N/A

7. Change Orders

   Did the Contractor unreasonably claim change orders or extras? Were the Contractor's prices on change orders and extra work reasonable?

   ____ Unacceptable ____ Poor ____ Satisfactory ____ Excellent ____ N/A

8. Paperwork Processing

   Rate this Contractor's performance in completing and submitting required project paperwork (i.e. change orders, submittal, drawings, invoices, workforce reports, etc.) Did the Contractor submit the required paperwork promptly and in proper form?

   ____ Unacceptable ____ Poor ____ Satisfactory ____ Excellent ____ N/A

9. Supervisory Personnel

   Rate the general performance of this Contractor's supervisory personnel. Did they have the knowledge, management skills and experience to run a project of this size and scope?

   ____ Unacceptable ____ Poor ____ Satisfactory ____ Excellent ____ N/A

10. Expertise, Knowledge and Experience

    Rate this Contractor's personnel. Were they dedicated, experienced and qualified for the duration of project.

    ____ Unacceptable ____ Poor ____ Satisfactory ____ Excellent ____ N/A

11. Project/Contract Closeout

    Rate the Contractor's performance on timeliness and quality of closeout deliverables such as As-Built Drawings, Operation and Maintenance Manuals, and training. Did the Contractor complete the tasks or Project on schedule; was the punch list completed within the allotted time?

    ____ Unacceptable ____ Poor ____ Satisfactory ____ Excellent ____ N/A

12. Level of Overall Performance

    ____ Unacceptable ____ Poor ____ Satisfactory ____ Excellent ____ N/A

Based on these comments, would you recommend this Contractor for comparable work in the future?

☐ Yes ☐ No

Please provide any comments regarding the Contractor's performance or the quality of its work. The Contractor can also provide any comments or clarification on the evaluation in the box below.

(Project Officer or Contractor, use additional sheets, if Necessary):

Signatures and Certifications:

1. The information contained in this evaluation form represents, to the best of my knowledge, a true and accurate analysis of the Contractor's performance record on this Contract; and,
2. The contents on the evaluation form and the ratings were not negotiated with the Contractor or its representative for any reason.

Evaluator's Signature:_____ Date: _____

Evaluator's (PjO) Printed Name_____ Evaluator's Title: _____

Contractor's signature below acknowledges receipt and the opportunity to respond:

Contractor Signature:_____ Date: _____

Contractor Printed Name:_____ Title: _____

EVALUATION RATINGS DEFINITIONS

Rating	Definition	Notes
Excellent	Performance meets contractual requirements and exceeds many to the County's benefit. The contractual performance of the element or sub-element being evaluated was accomplished with few minor problems for which corrective actions taken by the contractor were highly effective.	To justify an Exceptional rating, identify multiple significant events and state how they were of benefit to the County. A singular benefit, however, could be of such magnitude that it alone constitutes an Exceptional rating. Also, there should have been NO significant weaknesses identified.
Satisfactory	Performance meets contractual requirements. The contractual performance of the element or sub-element contains some minor problems for which corrective actions taken by the contractor appear or were satisfactory.	To justify a Satisfactory rating, there should have been only minor problems, or major problems the contractor recovered from without impact to the contract/order. There should have been NO significant weaknesses identified. A fundamental principle of assigning ratings is that contractors will not be evaluated with a rating lower than Satisfactory solely for not performing beyond the requirements of the contract/order.
Poor	Performance does not meet some contractual requirements. The contractual performance of the element or sub-element being evaluated reflects a serious problem for which the contractor has not yet identified corrective actions. The contractor's proposed actions appear only marginally effective or were not fully implemented.	To justify poor performance, identify a significant event in each category that the contractor had trouble overcoming and state how it impacted the County. A poor rating should be supported by referencing the management tool that notified the contractor of the contractual deficiency (e.g., management, quality, safety, or environmental deficiency report or letter).

Unacceptable	Performance does not meet most contractual requirements and recovery is not likely in a timely manner. The contractual performance of the element or sub-element contains a serious problem(s) for which the contractor's corrective actions appear or were ineffective.	To justify an Unsatisfactory rating, identify multiple significant events in each category that the contractor had trouble overcoming and state how it impacted the County. A singular problem, however, could be of such serious magnitude that it alone constitutes an unsatisfactory rating. An Unsatisfactory rating should be supported by referencing the management tools used to notify the contractor of the contractual deficiencies (e.g., management, quality, safety, or environmental deficiency reports, or letters).
Not Applicable (N/A)	N/A (not applicable) should be used if the ratings are not going to be applied to a particular area for evaluation.	

END

EXHIBIT E
ARLINGTON COUNTY DES ENGINEERING
SPECIAL CONDITIONS

Contents

PROJECT SUMMARY

The purpose of the Shirlington Road Pedestrian Bridge project is to build a new bicycle and pedestrian prefabricated bridge across Four Mile Run to provide for an effective and safe bicycle and pedestrian access. The other improvements include new streetlighting, median, sidewalk and crosswalk retrofits, as well as a new Rectangular Rapid Flashing Beacon (RRFB).

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

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

SUPPLEMENTS TO THE GENERAL CONDITIONS

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

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

ARTICLE B – DRAWINGS, SPECIFICATIONS AND RELATED DATA

SC-B.10 TESTS

Add the following new language to Paragraph B.10:

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

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

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

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

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

SC-B.13 SURVEYS AND CONTROLS

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

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

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

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

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

Add the following new language to Paragraph C.1:

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

SC-C.4 INSPECTION OF WORK

Add the following new language to Paragraph C.4:

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

SC-C.9 CONTRACTOR MANAGEMENT PERSONNEL

Add the following new language to Paragraph C.9:

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

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

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

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

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

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

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

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

SC-C.13 PROTECTION OF WORK AND PROPERTY

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

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

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

ARTICLE E – LEGAL RESPONSIBILITY AND PUBLIC SAFETY

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

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

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

SC-E.2 PUBLIC CONVENIENCE

Add the following new language to Paragraph E.2:

The Contractor shall set up controls at the beginning of each work day and take down controls at the end of each work day for the duration of the project. At all times the Contractor shall maintain safe two-way vehicular traffic, and safe accessible pedestrian traffic in conformance with County and VDOT standards.

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

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

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

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

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

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

The Contractor shall install project information signs (size - 36”x48”) at least two (2) different locations for each site. Signs will be supplied by the County. Sign posts and

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

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

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

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

Add the following new language to Paragraph E.10:

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

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

Delete Paragraph 2.

ARTICLE F– PROGRESS AND COMPLETION OF THE WORK

SC-F.2 TIME FOR COMPLETION

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

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

ARTICLE G– MEASUREMENT AND PAYMENT

SC-G.1 PAYMENTS TO CONTRACTOR

Add the following new language to Section G.1:

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

SPECIAL CONDITIONS

These Special Conditions include any project-specific requirements in addition to the General Condition, Supplementary Specifications, and the County Standards Referenced herein.

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1. CONSTRUCTION STANDARDS

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

- **The Arlington County Department of Environmental Services (DES) Bike Parking Standards**, a copy of which may be downloaded at no charge from the internet at: https://info.arlingtontransportationpartners.com/arlington-county-bike-parking-standards
- **The Arlington County Department of Environmental Services (DES) Construction Standards and Specifications,** a copy of 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 Specifications**, a copy of which may be downloaded at no charge from the internet at: https://transportation.arlingtonva.us/traffic-signal-specification-updates/
- **The Arlington County Department of Environmental Services (DES) Streetlight Specifications**, a copy of which may be downloaded at no charge from the internet at: https://transportation.arlingtonva.us/streets/street-lights/lighting-standards-specifications-updates/
- **The Arlington County Department of Environmental Services (DES) Pavement Marking Specifications**, a copy of which may be downloaded at no charge from the internet at: http://transportation.arlingtonva.us/streets/traffic-signals/
- **The Arlington County Department of Parks and Recreation (DPR) Specifications**, a copy of which may be downloaded at no charge from the internet at: https://www.arlingtonva.us/Government/Departments/Parks-Recreation/About/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/const/spec-default.asp
- **The Virginia Work Area Protection Manual (WAPM),** a copy of which may be downloaded at no charge from the internet at: https://www.virginiadot.org/business/trafficeng-WZS.asp
- **Manual on Uniform Traffic Control Devices(MUTCD),** a copy of which may be downloaded at no charge from the internet at: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/pdf_index.htm

- **The Arlington County Department of Environmental Services (DES) Dechlorination and Disposal Procedures**, a copy of which may be downloaded at no charge from the internet at: https://www.arlingtonva.us/Government/Programs/Water-Utilities/Discharging-Chlorinated-Water

- **The Supplementary Specifications listed within the Contract**.

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

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

2. PERMITS

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

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

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

The County will obtain the County LDA permit and the County RPA permit. The Contractor shall transfer the County LDA permit, in the Contractors name as the permittee and/or responsible party prior to the start of Work.The Contractor will obtain and pay for VDOT Land Use permit, if required prior to the start of work.

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

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

3. SPECIAL CONTRACTOR/SUBCONTRACTOR QUALIFICATIONS

The Contractor shall have seven continuous years of experience conducting public works infrastructure, bridge construction, and street improvement projects in an urban environment. The experience shall be work of similar size and scope, construction, re-construction, and maintenance. The Contractor's obtained project experience shall consist of the following:

- **New Bridge Construction**
- **State and County streets**
- **Curbs and gutters**
- **Sidewalks and walkways**
- **Pavement markings and signage**
- **Electrical conduits**
- **Traffic signals and street lighting**
- **Streetscapes and related site work**

4. STAKEOUT AND CUT-SHEETS

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

5. WORK HOURS

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

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

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

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

6. GENERAL SITE SECURITY AND CONTROLS

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

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

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

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

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

7. TRAFFIC SIGNALS AND STREETLIGHTS

Materials and construction of the communications conduit, streetlights, and traffic signals shall abide by the latest versions of the 'Arlington County Traffic Signal Specifications and Standards' and 'Arlington County Lighting Specifications and Standards. All materials for these areas shall be approved by Arlington County Transportation Engineering and Operations Bureau. The County Project Officer will facilitate the material specification submissions for review by the Transportation Engineering and Operations Bureau.

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

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

Installation of electrical service for temporary services such as signals, streetlights, signal cabinets, construction trailers, or for equipment use are incidental to the contract.

Intercepting existing streetlight conduits and splicing into existing cables are incidental to the contract.

References to a CCTV camera shall mean to both furnish and install the CCTV camera, unless specifically excluded.

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

SUPPLEMENTS TO THE DES CONSTRUCTION STANDARDS AND SPECIFICATIONS

SECTION 01500 – TEMPORARY EROSION AND SEDIMENT CONTROL

PART 3 - EXECUTION

PARAGRAPH 3.1 Installation and Maintenance of Erosion and Sediment Controls

Delete

3.5.C The Contractor shall conduct dewatering operations in a manner to prevent sediment or other pollutants from discharging to the County's storm drain system, which includes the curb and gutter, or any surface water. Dewatering operations shall not create any erosion or flooding. Dewatering discharges that contain chemicals, hydrocarbons, or sewage shall not be discharged to the storm drain system. Any discharge from dewatering operations shall be properly filtered prior to being discharged. A dewatering plan with sufficient detail to ensure the proposed dewatering shall comply with applicable regulations must be included as part of the erosion and sediment control plan.

Add

3.5.C The Contractor shall conduct dewatering operations in a manner to prevent sediment or other pollutants from discharging to the County's storm drain system, which includes the curb and gutter, or any surface water. Dewatering operations shall not create any erosion or flooding. Dewatering discharges that contain chemicals, hydrocarbons, or sewage shall not be discharged to the storm drain system. Any discharge from dewatering operations shall be properly filtered prior to being discharged. A dewatering plan with sufficient detail to ensure the proposed dewatering shall comply with applicable regulations shall be prepared by the Contractor.

SECTION 02200 – EARTHWORK

PART 3 - EXECUTION

PARAGRAPH 3.5 Dewatering

Delete

3.5.C The Contractor shall conduct dewatering operations in a manner to prevent sediment or other pollutants from discharging to the County's storm drain system, which includes the curb and gutter, or any surface water. Dewatering operations shall not create any erosion or flooding. Dewatering discharges that contain chemicals, hydrocarbons, or sewage shall not be discharged to the storm drain system. A dewatering plan with sufficient detail to ensure the proposed dewatering shall comply with applicable regulations must be included as part of the erosion and sediment control plan.

Add

3.5.C The Contractor shall conduct dewatering operations in a manner to prevent sediment or other pollutants from discharging to the County's storm drain system, which

includes the curb and gutter, or any surface water. Dewatering operations shall not create any erosion or flooding. Dewatering discharges that contain chemicals, hydrocarbons, or sewage shall not be discharged to the storm drain system. Any discharge from dewatering operations shall be properly filtered prior to being discharged. A dewatering plan with sufficient detail to ensure the proposed dewatering shall comply with applicable regulations shall be prepared by the Contractor.

SECTION 02500 – GRAVITY SEWERS AND APPURTENANCES

PART 4 – MEASUREMENT AND PAYMENT

PARAGRAPH 4.1 Sewer

Delete

4.1.A Sewer pipe for the various materials, classes, and sizes shown on the plans shall be measured in linear feet along the center line of the pipe and shall be measured from inside wall of structure to inside wall of structures. Payment shall include the furnishing of all pipe and fittings, all necessary tests, excavation, removal and disposal of existing pipes, removal and disposal of unsuitable or surplus material, placement of bedding and backfill as shown in Standard M-3.0, restoration of roadways as shown in Standard M-6.1, all other restoration, and all other work required to providing a complete sewer installation in compliance with the Construction Documents.

Add

4.1.A 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, abandonment and/or removal and disposal of existing pipes, removal and disposal of unsuitable or surplus material, placement of bedding and backfill as shown in Standard M-3.0, restoration of roadways as shown in Standard M-6.1, all other restoration, and all other work required to providing a complete sewer installation in compliance with the Construction Documents.

SECTION 02600 - BITUMINOUS ROADWAY PAVEMENTS

PART 4 – MEASUREMENT AND PAYMENT

Delete

4.2 Subbase shall be measured to the width and depths shown on the approved plans as verified in the field by the Project Officer or his designee. Payment shall be in cubic yards of material.

Add

4.2 Subbase shall be measured to the width and depths shown on the approved plans as verified in the field by the Project Officer or his designee. Payment shall be in cubic yards of material and shall include demolition, excavation, and the necessary preparation of the sub grade surface.

SECTION 02900 - PAVEMENT MARKINGS

PART 3 - EXECUTION

PARAGRAPH 3.2 Provision for Temporary Markings

Add

B. All Type D pavement markings shall conform to the latest VDOT requirements.

PART 4 - MEASUREMENT AND PAYMENT

PARAGRAPH 4.4 Removal/Eradication of Existing Pavement Markings

Delete

A. Payment for pavement line markings (type, class, width) removal and/or eradication shall be paid by actual work performed as listed in the contract and shall include all labor, materials, tools, equipment, transportation, supplies, and incidentals required to remove and/or eradicate the line markings as specified.

Add

A. Payment for pavement line markings (type, class, width) removal and/or eradication shall be incidental to the work and no separate payment shall be made.

Add

PARAGRAPH 4.5 Pavement Message Marking

A. Measurement of pavement message markings (type, class, size) shall be in units of each furnished and installed.

B. Payment for pavement message markings (type, class, size) shall be in units of each and shall include all labor, materials, tools, equipment, transportation, supplies, and incidentals required to furnish and install the message markings as specified.

SECTION 329100 - PLANTING PREPARATION

PART 4 - MEASUREMENT AND PAYMENT

Add

4.10 The measurement of CONTINUOUS SOIL PANEL to be paid for shall be per CUBIC YARD of the amended soil in accordance with the plans, specifications and to the satisfaction of the Project Officer.

4.11 The unit price for CONTINUOUS SOIL PANEL shall include the cost of furnishing all labor, materials, equipment and incidental expenses, including but not limited to imported topsoil, vapor barrier, 4" UD-4 underdrain (per VDOT specification), bedding material per Continuous Soil Panel and Tree Pit Drainage Details, and connection to storm sewer system.

SUPPLEMENTS TO THE 2020 LIGHTING SPECIFICATIONS

Modify the listed sections as follows:

SECTION 14050 – LIGHTING CONDUCTORS

PART 4 MEASUREMENT AND PAYMENT

Delete

(a) Furnish Conductor shall be measured and paid for on a linear foot basis.
(b) Install Conductor will be measured and paid for on a linear foot basis. Several conductors pulled into a single conduit at the shall be measured by the length of the pull rather than the total length of the conductors installed. Cost for pulling conductors shall include all connectors, splice enclosures, or other appurtenances required for making the electrical connections.

1. The cost of installing or replacing pull rope shall be incidental to the cost of pulling conductor.

Add

(a) Furnishing and installing all conductor(s) and/or cable(s) for streetlights is included in a single price paid per linear foot measured by the length of conduit installed. The Unit Price shall include the cost of all conductors, fittings, connections, slack, securing terminals and other incidentals necessary for the Work as detailed in the County Lighting Specifications.

1. The size, number and/or required slack length of the conductor(s) and/or cable(s) will not be assessed independently for payment.

2. The cost of installing or replacing pull rope shall be incidental to the cost of the conductor(s).

(b) THIS LINE INTENTIONALLY LEFT BLANK

DYNAMIC PILE TESTING FOR FRICTION PILES (LRFD)

I. DESCRIPTION

This work shall consist of dynamic testing of piles by the use of electronic monitoring equipment, reprocessing the data and furnishing a written report of the results.

II. EQUIPMENT

All equipment necessary for the dynamic monitoring, including but not limited to the gages and cables, shall be furnished by the Dynamic Testing Consultant. All the equipment shall conform to the requirements of ASTM-4945-08, Standard Test Method for High Strain Dynamic Testing of Piles.

III. PERSONNEL

The Contractor shall employ a Dynamic Testing Consultant to install or supervise the installation of the necessary equipment, to perform the dynamic monitoring and to prepare the Dynamic Testing Report.

The dynamic monitoring operator shall have a minimum of two years experience, at least one of which shall have been in data acquisition from high strain dynamic pile testing and successful performance on at least two projects in similar geotechnical conditions, or who has a Certificate of Testing: Basic Level or better on the Foundation QA Examination for Providers of Pile Dynamic Analyzer (PDA) Testing Services.

The Dynamic Pile Testing Report shall be prepared by a Registered Professional Engineer (Engineer) with a minimum of five years experience, at least two of which shall have been in data interpretation from high strain dynamic pile testing and successful completion of at least five projects in similar geotechnical conditions, or who has a Certificate of Interpretation: Advanced Level or better on the Foundation QA Examination for Providers of PDA Testing Services.

IV. TESTING

Dynamic testing shall be conducted in the presence of the Engineer and during the entire time piles are initially driven or redriven and during pile restrike testing.

The Contractor shall notify the Engineer of the date and time for dynamic testing at least 48 hours prior to testing. Such notice shall be given during the normal work hours of the County. If additional dynamic testing is ordered by the Engineer, the Contractor shall schedule the tests in cooperation with the availability of the Engineer.

Where possible, splices to the pile(s) shall be made prior to the start of driving so that dynamic testing can be performed without interruption.

The Contractor shall fasten a pair of transducers and a pair of accelerometers in place prior to testing. Piles shall be driven until the soil resistance measured is 80 percent of the Nominal Pile Resistance shown on the plans and the required minimum tip elevation and penetration have been

obtained or as directed by the plans, approved wave equation analysis or as approved by the Engineer. Any pile not developing the specified end of initial drive Mobilized Pile Resistance shall be left at least one foot above cut off grade to allow for restrike testing. The Contractor shall remove the transducers and accelerometers after the dynamic testing is completed.

Pile restrike testing shall be conducted no sooner than 120 hours after the pile, or any pile within a 25 foot radius, has been driven. Restrike testing shall include dynamic testing of the pile when it is redriven. The pile shall be redriven with the same pile hammer used for initial driving. The restrike driving sequence shall be performed with a warmed up hammer and shall consist of striking the pile for 20 blows or until the pile penetrates an additional 3 inches, whichever occurs first. If the soil resistance measured on restrike is less than the Nominal Pile Resistance shown on the plans, the Engineer may direct the Contractor to drive all or a portion of the remaining test pile length and repeat the restrike testing. The Contractor will be notified by the Engineer of the necessity to perform a second restrike test within 3 days of the receipt of the results from a signal-matching analysis that estimates static soil resistance and simulates static load test results from the initial restrike.

All signals resulting from initial testing and any restrike testing shall be recorded and made available upon the request of the Engineer.

V. REPORTS

If requested by the Engineer, the following information shall be provided within 24 hours after completion of the testing: for each blow from the Dynamic Driving Records provide the Depth, Maximum Transferred Energy, Blows per Minute (including strokes, fuel settings, bounce chamber pressures, etc. as applicable), Maximum Tensile Stress, Maximum Compressive Stress and Pile Resistance.

The Contractor shall furnish the Engineer a Dynamic Pile Testing Report with the production pile order list.

The Dynamic Pile Testing Report shall include the following information for each pile tested:

Project identification and location

Location of test,

Date of test,

Description of the subsurface soil condition including log of nearest boring

Description of the test pile

Description of pile installation equipment, the lead type and any special installation equipment

Description of dynamic testing equipment, including model and software version(s) utilized in obtaining, evaluating and reporting dynamic data.

A copy of the Pile Driving Record

Pile Installation Details and Comments

Discussion of the hammer performance
Discussion of pile integrity

For at least every fifth blow from the Dynamic Driving Records: the Depth, Maximum Transferred Energy, Blows per Minute (including strokes, fuel settings, bounce chamber pressures, etc. as applicable), Maximum Tensile and Compressive Stress and Pile Resistance.

A graphical presentation of the following: Pile Penetration versus Maximum Transferred Energy, Maximum Compressive Stress, Maximum Tension Stress and Mobilized Pile Resistance.

The results from a signal-matching program that estimates static soil resistance and simulates static load test results for both the end of initial drive conditions and the beginning of restrike conditions including Mobilized Pile Resistance for the shaft and toe with the associated parameters used in the estimation. The skin friction distribution along the pile shall also be presented.

When Dynamic Pile Testing is followed by a pile load test include a summary of soil resistance from both Load and Dynamic Testing, including an evaluation of the correlation between the two approaches and discussion of any discrepancies, if applicable. Plot of applied load versus average butt settlement, with determination of the nominal resistance required by the specifications, shall be provided.

A summary tabulation of the following information for both Initial Drive and Restrike: Pile Location and Designation, Date Driven, Pile Tip Elevation, Visual Blow Count Rate, Transferred Energy, Hammer Efficiency, Maximum Driving Stresses, Dynamic Testing Mobilized Pile Resistance, Signal-Matched Mobilized Pile Resistance for Shaft, Toe and Combined.

Recommendations for production pile driving criteria based on the results of the testing program. Driving criteria shall include: blow count to obtain the required Mobilized Pile Resistance for both initial drive and the restrike of a production pile that does not meet initial criteria (include: stroke(s), fuel setting(s), bounce chamber pressure(s), etc. as applicable), criteria for controlling driving stresses in the pile (including maximum allowable hammer strokes, recommendations for preboring or jetting that might be required, cushion material, thickness and replacement, etc. as applicable) to control driving stresses in the pile and criteria for terminating driving in the event of high blow court before reaching the approved tip elevation. Pile driving criteria shall be approved by the Engineer.

IV. MEASUREMENT AND PAYMENT

Dynamic pile testing (Friction Piles) will be measured and paid for at the contract unit price per each, which price shall be full compensation for providing all services of the testing consultant and dynamic monitoring operator as specified herein including providing, installing, monitoring the dynamic testing equipment, removing the dynamic test equipment, providing the data and preparing the written documentation specified, and for all tools, labor, materials, and incidentals necessary to complete the work. This price shall also include all work and equipment necessary to drive the pile during restrike testing, and any additional driving required should the required soil resistance not be obtained.

Payment will be made under:

Pay Item	**Pay Unit**
Dynamic Pile Test (Friction Piles)	Each

PREFABRICATED STEEL TRUSS

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. Virginia Department of Transportation Road and Bridge Specifications, 2020 (VDOT Specifications)

1.2 SUMMARY

A. These specifications are for a fully engineered clear span steel truss bridge and shall be designed and manufactured by CONTECH Engineered Solutions at www.conteches.com or equivalent as approved by the Engineer. Truss shall be similar to the CONTECH Connector® Truss. To be considered equivalent, the truss must have parallel top and bottom chords.

1.3 MEASUREMENT AND PAYMENT

A. Prefabricated Streel Truss shall be paid for as a lump sum. The price shall include design, fabrication, delivery, erection, wood deck, rub rails, safety rails, toe plates, bearing assemblies and any associated hardware, false work or temporary supports.

1.4 SUBMITTALS

A. Shop drawings shall be submitted to the County for review and approval. Shop drawings shall be signed and sealed by a Professional Engineer licensed in the Commonwealth of Virginia.

PART 2 – PRODUCTS

2.1 MATERIALS

A. All structural members shall have a minimum thickness of material of at least 3/16".

B. Type of steel:

1. Members shall be fabricated from ASTM A242 or ASTM A588 steel for plates and structural shapes, and ASTM A606 or ASTM A847 for tubular sections.

2. Minimum yield strength of steel members shall be greater than or equal to 50,000 psi.

3. Steel shall be unpainted weathering steel.

C. Bridge deck:

1. Wood decking shall be No. 1 Grade Southern Yellow Pine.

2. Wood decking shall be treated to a minimum of 0.40 pounds of preservative per cubic foot of wood.

3. Wood decking shall be designed for a pedestrian loading condition of 90 psf and a 20,000 lb vehicular live load.

D. Field splices shall be bolted with High Strength ASTM A325 bolts. Type 3 bolts shall be used for weathering steel bridges.

E. Welding materials shall be in strict accordance with the American Welding Society (AWS). Structural welding code, D1.1. Filler metal as specified in 4.1 shall be used for the particular welding process required. Welders will be certified in accordance with AWS D1.1

PART 3 – EXECUTION

3.1 DIMENSIONS

A. Dimensions shall be in accordance with the details shown in the plans.

3.2 DESIGN

A. Open truss bridges shall be designed by a professional engineer experienced in pony truss bridge design for pedestrian use. Engineers shall be licensed in the Commonwealth of Virginia.

B. In addition to self-weight and other dead loads, the bridges shall be designed for the following:

1. Pedestrian live load: A uniformly applied load of 90 psf, in accordance with the AASHTO Guide Specification for the Design of Pedestrian Bridges.

2. Vehicle load: Bridge will also be designed to withstand a moving vehicle load which weighs 20,000 pounds.

3. Wind load: Bridge shall be designed for a minimum wind load of 35 pounds per

square foot (approximately 120 mph). The wind should be calculated on the entire vertical surface of the bridge as if fully enclosed.

C. Design Criteria: The design of the bridges shall be in accordance with the AASHTO LRFD Bridge Design Specifications, 8th Edition, 2017; and LRFD Guide Specifications for Design of Pedestrian Bridges, 2nd Edition, 2009.

D. Temperature: Bridge shall be designed to accommodate a temperature differential of 120 degrees Fahrenheit. Bridges shall be placed on elastomeric bearing pads sufficient to accommodate thermal movements. At least 3/4" clearance shall be provided between the bridge and concrete abutments.

E. Deflection: The vertical deflection of the bridge due to pedestrian live load shall not exceed 1/400 of the span length. The maximum deflection due to vehicular loads shall not exceed 1/800 of the span length. For pedestrian comfort, the load used for the deflection check be a minimum of 500 pounds per lineal foot of bridge or the uniform pedestrian live load, whichever is greater. The horizontal deflection due to lateral wind load shall not exceed 1/500 of the span length.

3.3 FABRICATION AND QUALITY CONTROL

A. Bridge fabricator shall be certified by the American Institute of Steel Construction to have the personnel, organization, experience, capability, and commitment to produce fabricated structural steel for Major Steel Bridge Structures with Fracture Critical and Sophisticated Paint Endorsements as set forth in the American Institute of Steel Construction (AISC) Certification Program.

B. Workmanship, fabrication, and shop connections shall be in accordance with American Association of State Highway and Transportation Officials Specifications (AASHTO).

C. Welding operators shall be properly accredited experienced operators, each of whom shall submit satisfactory evidence of experience and skill in welding structural steel with the kind of welding to be used in the work, and who have demonstrated the ability to make uniform good welds meeting the size and type of weld required.

D. All welding shall utilize E70 or E80 series electrodes. The weld process used shall be Flux Core Arc Welding (FCAW) or Gas Metal Arch Welding (GMAW).

E. All structural elements used in the bridge shall be identified by heat number of the steel member used. Specific mill test reports and individual welder certificates shall be tracked and kept on file to be provided at the request of the owner or engineer.

F. To ensure quality control during bridge fabrication, the bridge supplier shall be the designer and fabricator of the bridge and shall not assign, sublet, or subcontract any part of the bridge fabrication including painting.

G. The bridge design Professional Engineer shall inspect the bridge structure after fabrication and furnish a signed and sealed Conformance Report and Affidavit verifying that the bridge has been inspected by the Engineer and fabricated in accordance with the Engineer's design calculations and approved shop drawings. This inspection and report shall not be delegated to any other engineer or person. The report shall include a summary of computations of the corrosion index (per ASTM G101) for every heat number of structural steel used in the bridge to verify that the steel is of a weathering grade.

H. Each bridge shall be inspected by a Certified Welding Inspector that is qualified under the American Welding Society (AWS) QC-1 program. This inspection shall include as a minimum requirement the following: review of shop drawings, weld procedures, welder qualifications, and weld testing reports, visual inspection of welds and verification of overall dimensions and geometry of the bridge. A report shall be produced indicating the above items were reviewed and shall be signed and sealed by the CWI signifying compliance with AWS D1.1 codes

3.4 RAILING AND ACCESSORIES

A. All railings shall have a smooth inside surface with no protrusions or depressions. All ends of angles and tubes shall be closed and ground smooth. In accordance with AASHTO, railings for bicycle use should be a minimum height of 54" above the floor deck.

B. Continuous rails shall be located on the inside of the trusses. The safety rails shall be horizontal rails with a maximum opening of 4 inches.

3.5 FINISHES

A. All boldly exposed surfaces of weathering steel bridges shall be sand blasted in accordance with the Steel Structures Painting Council (SSPC) Surface Preparation Specification No. 7 "Brush Blast Cleaning".

3.6 DELIVERY AND ERECTION

A. Bridges will be delivered by truck to a location nearest to the site accessible by roads. Hauling permits and freight charges are the responsibility of the manufacturer.

B. The manufacturer will notify the Contractor in advance of the expected arrival. Information regarding delays after the trucks depart the plant such as weather, delays in permits, re-routing by public agencies or other circumstances will be passed on to the customer as soon as possible but the expense of such unavoidable delays will not be accepted by the manufacturer.

C. The manufacturer will advise the Contractor of the actual lifting weights, attachment points and all necessary information to install the bridge. Unloading, splicing, bolting, and proper

lifting equipment is the responsibility of the Contractor.

D. The Contractor shall install theanchor bolts in accordance with the manufacturer's anchor bolt spacing dimensions. All grounding and lightning protection shall be the responsibility of the Contractor.

3.7 LIMITED WARRANTY

A. The bridge supplier shall warrant their steel structure(s) to be free of design, material and workmanship defects for a period of ten years from the date of delivery.

EXHIBIT F

Geotechnical Engineering Report

Shirlington Road Pedestrian Bridge
Shirlington, Arlington County, Virginia
February 11, 2021
Terracon Project No. JD205151

Prepared for:
Volkert, Inc
Springfield, Virginia

Prepared by:
Terracon Consultants, Inc.
Ashburn, Virginia

February 11, 2021

Volkert, Inc
6225 Brandon Avenue, Suite 540
Springfield, Virginia 22150

Attn: Mr. Brian Graham, PE
P: (703) 738-8331
E: brian.graham@volkert.com

Re: Geotechnical Engineering Report
Shirlington Road Pedestrian Bridge
Shirlington, Arlington County, Virginia
Terracon Project No. JD205151

Dear Mr. Graham:

We have completed the Geotechnical Engineering services for the above referenced project. This study was performed in general accordance with Terracon Proposal No. PJD205151 dated May 8, 2020. This report presents the findings of the subsurface exploration and provides geotechnical recommendations concerning earthwork and the design and construction of foundations for the proposed project. The final report will be signed and sealed after incorporating all the comments from the departments review.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning this report or if we may be of further service, please contact us.

Sincerely,
Terracon Consultants, Inc.

Braque Mathson, EIT
Senior Project Manager

Sushant Upadhyaya, PhD, PE, PMP, RMP
Principal

REPORT TOPICS

Note: This report was originally delivered in a web-based format. For more interactive features, please view your project online at client.terracon.com.

ATTACHMENTS

Note: Refer to each individual Attachment for a listing of contents.

Geotechnical Engineering Report

Shirlington Road Pedestrian Bridge
Shirlington, Arlington County, Virginia

Terracon Project No. JD205151
February 11, 2021

INTRODUCTION

This report presents the results of our subsurface exploration and geotechnical engineering services performed for the proposed pedestrian bridge to be located parallel to the existing Shirlington Road Bridge over Four Mile Run in Shirlington, Arlington County, Virginia. The purpose of these services is to provide information and geotechnical engineering recommendations relative to:

- Subsurface soil conditions
- Groundwater conditions
- Site preparation and earthwork
- Seismic site classification
- Foundation design and construction
- Lateral earth pressures
- Global Stability
- Trail Pavement

The geotechnical engineering Scope of Services for this project included the advancement of two test borings to depths of 60 feet below existing site grades.

Maps showing the site and boring locations are shown in the **Site Location** and **Exploration Plan** sections, respectively. The results of the laboratory testing performed on soil samples obtained from the site during the field exploration are included on the boring logs and as separate graphs in the **Exploration Results** section.

SITE CONDITIONS

The following description of site conditions is derived from our site visit in association with the field exploration and our review of publicly available geologic and topographic maps.

Item	Description
Parcel Information	The project is located parallel to Shirlington Rd at Four Mile Run in Arlington County, Virginia (approximate 38.8431, -77.0859) See **Site Location**
Existing Improvements	Existing Shirlington Road bridge over Four Mile Run, asphalt trail along S. Arlington Mill Drive and concrete side walk along Shirlington Road, and other improvements around the project site. There are many underground utilities located in the area.

Item	Description
Current Ground Cover	Paved roadway, grass and concrete sidewalks
Existing Topography	Existing elevations vary from EL 32 at Four Mile Run level to EL 47 at the top of the slope.
Geology	The project site is located within the Coastal Plain Physiographic Province of Virginia. The Coastal Plain consists of a seaward thickening wedge of unconsolidated to semi-consolidated sedimentary deposits from the Cretaceous Geologic Period to the Holocene Geologic Epoch. These deposits represent marginal-marine to marine sediments consisting of interbedded sands and clays. The sediment beneath the majority of the proposed work area is mapped as the Potomac Formation which consists of pebbly quartzo-felspathic sands interbedded with sandy, organic-rich clays and silts. Potomac Formation is overlain by alluvial deposits including unconsolidated sand, silt, and gravel. Additionally, existing fill was encountered that are believed to be associated with previous site development.

PROJECT DESCRIPTION

Our initial understanding of the project was provided in our proposal and was discussed during project planning. A period of collaboration has transpired since the project was initiated, and our final understanding of the project conditions is as follows:

Item	Description
Information Provided	Volkert provided us the 30% Submission Plans dated January 24, 2020, 60% Submission Plans, and As-Built Plans dated May 2, 1969.
Project Description	The pedestrian bridge is planned at the northwest corner of Shirlington Road and S. Arlington Mill Drive. The bridge will span over Four Mile Run. For the south abutment of the pedestrian bridge, the existing wingwall of the roadway bridge will be modified. The plan is to use the existing foundation and modify the top of the wall to support the pedestrian bridge. The north abutment of the bridge will be new. About 75 feet of at-grade trail is planned to connect the north end of the abutment to the existing sidewalk at Shirlington Road.
Proposed Structure	A 150 feet long and 15 feet wide single span pedestrian bridge. The bridge will have single span steel frame with wood planks. The proposed bridge will be supported on deep foundations.

Item	Description
Maximum Loads	Pile load were provided by Volkert: Strength - I (max) = 79.3 kips Strength - I (min) = 34.4 kips Service - I (max) = 53.2 kips Service - I (min) = 30.6 kips
Estimated Start of Construction	2021

GEOTECHNICAL CHARACTERIZATION

We have developed a general characterization of the subsurface conditions based upon our review of the subsurface exploration, laboratory data, geologic setting and our understanding of the project. This characterization, termed GeoModel, forms the basis of our geotechnical calculations and evaluation of site preparation and foundation options. Conditions encountered at each exploration point are indicated on the individual logs. The individual logs can be found in the **Exploration Results** section and the GeoModel can be found in the **Figures** section of this report.

As part of our analyses, we identified the following model layers within the subsurface profile. For a more detailed view of the model layer depths at each boring location, refer to the GeoModel.

Stratum	General Description
Existing Fill	loose to medium dense, fine to coarse, CLAYEY SAND WITH GRAVEL (SC), SILTY SAND (SM), moist, light gray brown, gray to red brown.
Alluvium	medium dense to very dense, fine to coarse, CLAYEY SAND WITH GRAVEL (SC), POORLY GRADED SAND WITH GRAVEL (SP), CLAYEY SAND (SC), moist, light brown to white, light gray orange to red, light gray to light brown.
Potomac Formation	medium dense to very dense, SILTY SAND (SM), CLAYEY SAND (SC), SANDY LEAN CLAY (CL), POORLY GRADED SAND (SP), SANDY SILT (ML), SILTY CLAYEY SAND (SC-SM), moist, light blue gray, gray blue, light brown, gray to light brown, orange brown, gray, dark gray, light gray brown. hard to very hard, SILT (ML) with various percentage of sand, moist, dark gray

Groundwater

Groundwater level observations were made in the field during drilling and up to one day after the completion of the test borings. Longer-term groundwater level reading was obtained in temporary observation standpipe installed in test boring PB-2. A summary of the water level readings is presented below.

Test Boring No.	Ground Surface Elevation (ft)	Depth to Groundwater (ft)		Groundwater Elevation (ft)	
		During Drilling	Long-Term	During Drilling	Long-Term
PB-1	45.0	5.0	NR	40.0	NR
PB-2[1]	45.5	13.0	20.0	32.5	25.5

1. Temporary Standpipe was installed.
2. NR: Not Recorded

The groundwater observations presented herein are considered to be an indication of the groundwater levels at the dates and times indicated. Where more impervious silt and clay soils are encountered, the amount of water seepage into the borings is limited, and it is generally not possible to establish the location of the groundwater table through short term water level observations. Accordingly, the groundwater information presented herein should be used with caution. Also, fluctuations in groundwater levels should be expected with seasons of the year, construction activity, changes to surface grades, precipitation, or other similar factors.

Soil Laboratory Test Results

Selected soil samples obtained from the field investigation were tested for grain size distribution, Atterberg limits, and natural moisture contents. A summary of soil laboratory test results is presented in **Exploration Results**. In addition to standard geotechnical soil laboratory testing, five soil samples were submitted for corrosion testing.

Geotechnical Design Parameters

A summary of the soil design parameters is presented in Table 1 under **Supporting Documents**. For each analysis, soil shear strength design parameters were selected based on laboratory tests, VDOT's Soil Design Parameters for Sound Barrier Walls, Retaining Walls, and Non-Critical Slopes, and our experience with similar soil materials and geologic condition.

EARTHWORK

All earthwork procedures should conform to Section 303 of the VDOT Road and Bridge Specifications, 2020. Earthwork is anticipated to include clearing and grubbing, excavations, and fill placement. The following sections provide recommendations for use in the preparation of specifications for the work. Recommendations include critical quality criteria, as necessary, to render the site in the state considered in our geotechnical engineering evaluation for foundations and earthwork.

Fill materials should not be placed on frozen or frost-heaved soils, and/or soils that have been recently subjected to precipitation. All frozen or frost-heaved soils should be removed prior to continuation of fill operations. Borrow fill materials should not contain frozen materials at the time of placement. Compaction equipment that is compatible with the soil type used for fill should be selected. Theoretically, any equipment type can be used as long as the required density is achieved; however, sheepsfoot roller equipment are best suited for fine grained soils and vibratory smooth drum rollers are best suited for granular soils. Ideally, a smooth drum roller should be used for sealing the surface soils at the end of the day or prior to upcoming rain events. In addition, compaction equipment used adjacent to wingwalls should be selected so as to not impose undesirable surcharge on walls. All areas receiving fill should be graded to facilitate positive drainage of any water associated with precipitation and surface run-off.

Existing slopes should be continuously benched where embankments are constructed one-half width at a time; against slopes of existing embankments or hillsides; or across existing embankments, hillsides, and depressions at a skew angle of 30 degrees or more or the existing slopes are steeper than 4:1. For slopes steeper than 4:1 but not steeper than 1-1/2:1, the bench should be at least 6 feet in width. For slopes steeper than 1-1/2:1 but less than 1/2:1, the bench should be at least 4 feet in width. Benching should consist of a series of horizontal cuts beginning at the intersection with the original ground and continuing at each vertical intersection of the previous cut. Material removed during benching operations should be placed and compacted as embankment material.

After completion of compacted fill operations in pavement areas, asphalt operations should begin as soon as practically possible, or the finished subgrade should be protected from exposure to inclement weather conditions. Exposure to precipitation and freeze/thaw cycles will cause the finished subgrade to soften and become excessively disturbed. If construction plans require that finished subgrades remain exposed to weather conditions after completion of fill operations, additional fill should be placed above finished grades to protect the newly placed fill or reworking of the upper 1 to 2 feet of previously placed compacted fill should be planned.

Site Preparation

Prior to placing fill, any existing vegetation and root mat should be removed. Complete stripping of the topsoil should be performed in the proposed approach areas.

The subgrade should be proofrolled with an adequately loaded vehicle such as a fully-loaded tandem-axle dump truck within a minimum load of 25 tons. The proofrolling should be performed under the direction of the Geotechnical Engineer. Areas excessively deflecting under the proofroll should be delineated and subsequently addressed by the Geotechnical Engineer. Such areas should either be removed. Excessively wet or dry material should either be removed or moisture conditioned and recompacted.

Existing Fill

As noted in **Geotechnical Characterization**, borings PB-1 and PB-2 encountered existing fill to depths ranging from about 5 to 7 feet. The fill appears to have been placed in a controlled manner, but we have no records to indicate the degree of control. Support of foundations on or above existing fill soils, is discussed in this report. However, even with the recommended construction procedures, there is inherent risk for the owner that compressible fill or unsuitable material, within or buried by the fill will, not be discovered. This risk of unforeseen conditions cannot be eliminated without completely removing the existing fill but can be reduced by following the recommendations contained in this report.

Fill Material Types

Fill required to achieve design grade should be classified as structural fill and general fill. Structural fill is material used below, or within 20 feet of structures, pavements or constructed slopes. General fill is material used to achieve grade outside of these areas. Earthen materials used for structural and general fill should meet the following material property requirements:

Soil Type [1]	USCS Classification	Acceptable Parameters
Low Plasticity Cohesive	CL, CL-ML, ML	Liquid Limit less than 40 Plasticity index less than 15
Granular	GW, GP, GM, GC, SW, SP	Minimum CBR 5. Less than 10% Passing No. 200 sieve
Select Type I Material, CBR 30	VDOT 21A	As per VDOT Road and Bridge Specification 2020

1. Structural and general fill should consist of approved materials free of organic matter and debris. Frozen material should not be used, and fill should not be placed on a frozen subgrade. A sample of each material type should be submitted to the Geotechnical Engineer for evaluation prior to use on this site.

Fill Compaction Requirements

Structural and general fill should meet the following compaction requirements.

Item	Structural Fill	General Fill
Maximum Lift Thickness	8 inches or less in loose thickness when heavy, self-propelled compaction equipment is used. 4 inches in loose thickness when hand-guided equipment (i.e. jumping jack or plate compactor) is used	Same as Structural Fill
Minimum Compaction Requirements [1, 2]	95% of maximum dry density below foundations and within 6-inch of finished pavement subgrade 100% of max. above foundations, and within 6-inch below pavement subbase	As required to achieve the minimum compaction requirements
Water Content Range [1]	Soils: ±20% of optimum moisture content Aggregate: ±2% points of optimum moisture content	As required to achieve minimum compaction requirements

1. Maximum density and optimum water content as determined by the standard Proctor test (VTM 1).
2. If the granular material is a coarse sand or gravel, or of a uniform size, or has a low fines content, compaction comparison to relative density may be more appropriate. In this case, granular materials should be compacted to at least 95% relative density (ASTM D 4253 and D 4254).

Earthwork Construction Considerations

Shallow excavations for the proposed structure are anticipated to be accomplished with conventional construction equipment. Upon completion of filling and grading, care should be taken to maintain the subgrade water content prior to construction of floor slabs. Construction traffic over the completed subgrades should be avoided. The site should also be graded to prevent ponding of surface water on the prepared subgrades or in excavations. Water collecting over or adjacent to construction areas should be removed. If the subgrade freezes, desiccates, saturates, or is disturbed, the affected material should be removed, or the materials should be scarified, moisture conditioned, and recompacted prior to floor slab construction.

The groundwater was encountered in soil test borings, due to the interlayered nature of the sands and clays, seeps and or springs may be encountered during excavations. The volume of water generated by seeps or springs, if present, can vary significantly. It is critical that as soon as water seepage is observed, the contractor should excavate surface trenches from the observed water seepage to a sump pit and sump pump.

If the water is allowed to saturate the subgrades, softening of the subgrade will occur very quickly, and extra costs will be incurred. However, if the contractor can channel the water to a sump pit and keep the majority of the subgrade from getting saturated, extra costs due to water softening should be significantly reduced.

The groundwater table could affect over excavation efforts, especially for over-excavation and replacement of lower strength soils. A temporary dewatering system consisting of sumps with pumps could be necessary to achieve the recommended depth of over-excavation.

The design of temporary excavations should be in accordance with OSHA regulations and should be signed and sealed by a registered professional engineer experienced in the design of such systems. As a minimum, excavations should be performed in accordance with OSHA 29 CFR, Part 1926, Subpart P, “Excavations” and its appendices, and in accordance with any applicable local, and/or state regulations.

It may be necessary to install vertical excavation support for the proposed construction. The feasibility of excavation support methods depends on such factors as the nature of the soil and groundwater conditions of the site, the depth and width of the excavation, the proximity and sensitivity of adjacent existing structures and utilities, the compatibility of support system with the proposed construction, and the general expertise available in the local construction industry. Depending on these considerations, flexible or rigid excavation support systems may be considered.

Construction site safety is the sole responsibility of the contractor who controls the means, methods, and sequencing of construction operations. Under no circumstances shall the information provided herein be interpreted to mean Terracon is assuming responsibility for construction site safety, or the contractor's activities; such responsibility shall neither be implied nor inferred.

Construction Observation and Testing

The earthwork efforts should be monitored under the direction of the Geotechnical Engineer. Monitoring should include documentation of adequate removal of vegetation and topsoil, proofrolling, and mitigation of areas delineated by the proofroll to require mitigation.

Each lift of compacted fill should be tested, evaluated, and reworked, as necessary, until approved by the Geotechnical Engineer prior to placement of additional lifts. Each lift of fill should be tested for density and water content at a frequency as per VDOT specifications.

In addition to the documentation of the essential parameters necessary for construction, the continuation of the Geotechnical Engineer into the construction phase of the project provides the continuity to maintain the Geotechnical Engineer’s evaluation of subsurface conditions, including assessing variations and associated design changes.

SEISMIC CONSIDERATIONS

The seismic design requirements for buildings and other structures are based on Seismic Design Category. Site Classification is required to determine the Seismic Design Category for a structure.

The Site Classification is based on the upper 100 feet of the site profile defined by a weighted average value of either shear wave velocity, standard penetration resistance, or undrained shear strength in accordance with Section 20.4 of ASCE 7 and the International Building Code (IBC). Based on the soil properties encountered at the site and as described on the exploration logs and results, it is our professional opinion that the **Seismic Site Classification is D**. Subsurface explorations at this site were extended to a maximum depth of 60 feet. The site properties below the boring depth to 60 feet were estimated based on our experience and knowledge of geologic conditions of the general area. Additional deeper borings or geophysical testing may be performed to confirm the conditions below the current boring depth.

CORROSIVITY

The table below lists the results of laboratory soluble sulfate, soluble chloride, electrical resistivity, and pH testing. The values may be used to estimate potential corrosive characteristics of the on-site soils with respect to contact with the various underground materials which will be used for project construction.

Boring	Sample Depth (feet)	Soil Description	Soluble Sulfate (%)	Soluble Chloride (%)	Electrical Resistivity (Ω-cm)	pH
PB-2	5-10	SP	91	291	600	5.55
PB-2	10-15	CL	72	45	1201	7.96
PB-2	15-20	SC	49	43	4336	7.93
PB-2	20-25	CL	73	32	2101	8.17
PB-2	25-30	SM	43	23	3568	7.33

Based on corrosion consideration criteria presented in Section 23.05-1 of Chapter 23 dated April 30, 2020 we estimated a sacrificial metal loss of 30% over 75-year design life.

DEEP FOUNDATIONS

The abutment A (south side) will be supported on the existing bridge's wingwall (west end) that is supported by 10BP42 steel pile. After discussion with bridge design engineer it was confirmed that the design load shown on the as-built plans is the allowable capacity of 72 kips (36 tons). The wingwall (west end) has one row of vertical piles and two rows of battered piles (1H:4V). The length of the piles ranges varies from 25 feet to 30 feet and are embedded 1.5 feet in the abutment pile cap. The bottom of the abutment is assumed to be at elevation (EL) 28.5.

The abutment B (north side) will be supported on HP 12x53 steel piles with one row of vertical in the back and one row of battered piles in the front. The bottom of the abutment is assumed to be at EL 39.

As discussed with the bridge designer, the abutment A has been designed based on Allowable Stress Design (ASD) methodology and the abutment B has been designed based on AASHTO Load Resistance Factored Design (LRFD) methodology.

Driven Piles – Abutment A

The allowable stresses in piles are estimated based on section 4.5.7.3 of AASHTO 17th edition. The maximum allowable stress is (0.25)*(F_y)*(pile cross sectional area). We have reduced the pile area by 30 percent for corrosion considerations to estimate the axial capacity. AASHTO Section 4.5.6.2 recommends a factor of safety of 2.25 when performing static axial capacity calculation combined with a WEAP analysis and dynamic testing. Since the piles are under service for around 50 years we have used a factor of safety of 2.25 for design.

The ultimate and allowable structural pile capacities for the existing piles are calculated below:

F_y = 36 ksi ; Pile Cross section Area = 12.4 in^2; Sacrificial reduction of area = 30 percent

Allowable Structural Capacity: 0.25*36*12.4*0.70 = 78 kips;

Ultimate Structural Capacity: 78*2.25 = 175.5 kips

Geotechnical axial capacity was evaluated using the computer program APile version 2014.6.9 developed by Ensoft, Inc and the methods outlined in AASHTO Standard Specifications for Highway Bridges 17th Edition – 2002. We have developed the soil profiles and design parameters by reviewing the relevant test borings and laboratory test results. The soil properties and design parameters used in our analyses are summarized in Table 1 under **Supporting Documents**.

The geotechnical ultimate and allowable pile capacities are calculated to be 170 kips and 75.5 kips per pile, respectively. The design calculations and output files are presented in **Supporting Documents.** The settlement of the H-Piles was not evaluated since the applied load on the existing piles is expected to be less than design loads provided on the as-built plans.

Driven Piles – Abutment B

We have evaluated HP 12x53, Grade 50 piles to support the proposed pedestrian bridge at Abutment B. H-piles will develop the majority of their capacity through side resistance and end bearing on Potomac Formation.

The nominal axial compressive structural resistance (P_n) for piles loaded in compression should be as specified in LRFD Section 6.9.4.1. The H-piles are assumed to be fully embedded and the value of factor λ is taken as 0. Factored structural resistance (P_r) calculated for HP 12x53 of Grade 50 steel using a resistance factor (φ_c) of 0.50 is presented in the table below. It is the responsibility of the structural engineer to recalculate the nominal and factored pile structural compressive resistance (P_n) based on the actual unbraced pile length (l) and effective length factor (K), or on the actual elastic critical buckling resistance (P_e).

Pile Section	Steel Area A_s	Reduced Steel Area for Corrosion[1]	Nominal Structural Strength (P_n)[2]		Factored Structural Strength (P_r)[3]	
	in^2	in^2	kips	tons	kips	tons
HP 12x53	15.5	10.5	525	262	262	131

1. 30 percent reduction in area for corrosion consideration.
2. $P_n = 0.66^{\lambda} F_y A_s$
3. $P_r = P_n x \varphi_c$

We have calculated the geotechnical nominal compressional axial resistance of the piles using the computer program APile version 2014.6.9 developed by Ensoft, Inc. and the methods outlined in AASHTO LRFD Bridge Design Specifications 2020 (AASHTO LRFD). For the purposes of our calculations, the perimeter of the pile is assumed for the estimates of side resistance and the box area of the pile is assumed for the estimates of tip resistance. Up to 2 feet of new fill is expected at the abutment B to reach the proposed grade; therefore, we do not anticipate downdrag loads (negative side resistance) to be present on the piles. The factored resistance is calculated using a resistance factor (φ_{dyn}) of 0.65 and is summarized in table below. Since the geotechnical axial resistance is less than the structural resistance, we recommend that geotechnical axial resistance should be used for design.

Pile Section	Factored Design Axial Load (Q_p)	Nominal Design Resistance (R_n)[1]	Nominal Driving Resistance (R_{ndr})[3]	Estimated Elevation of Bottom of Pile Cap	Estimated Pile Length from Bottom of Pile Cap[2]	Estimated Pile Tip Elevation
	kips	kips	kips	feet	feet	feet
HP 12x53	79.5	122.5	125	39	27	12

1. $R_n = Q_p/0.65$; *Resistance factor (φ_{dyn}=0.65) assumes dynamic load testing of at least two piles per site condition, but no less than 2% of the production piles.*
2. Upper 3 feet of existing fill is not used in the axial resistance
3. Driving Resistance to reach estimated pile tip elevation (EL)

Pile center-to-center spacing of at least three pile widths is recommended, approximately 36 inches for HP 12X53 piles. The capacity of a pile group will be equal to the individual pile capacity multiplied by the number of piles in the group. The capacity of a group with closer pile spacing may be less and should be evaluated by the Geotechnical Engineer. We assumed there will be no scour at the abutment locations.

The vertical pile has a very low resistance to lateral loads and, for economy, substantial loadings are designed to be resisted by batter piles. The horizontal force can be resolved into two components, producing an axial compressive force and tensile force. We recommend that pile batter not exceed 1H:4V. Since the lateral load will be resisted by the battered piles no lateral load analysis has been performed.

Driven Pile Construction Considerations

The Contractor shall conduct wave equation analyses demonstrating the proposed hammer is suitable to install the proposed piles. Since dynamic testing methods will be used in the test pile program, the wave equation analysis must indicate that the hammer can mobilize the full nominal pile resistance during restrike. The wave equation analyses should demonstrate that the proposed hammer can develop the nominal driving resistance without exceeding allowable driving stresses. The contractor should submit the results of the wave equation analysis to the Geotechnical Engineer for review and acceptance, prior to mobilizing pile driving equipment to the site.

Dynamic pile load testing used with wave equation analyses is recommended to determine the driving criteria. We have used a resistance factor of 0.65 in our design recommendations, assuming that dynamic load testing will be performed. Pile driving equipment should be compatible with the soil conditions in order to achieve the required pile penetration and the required nominal pile driving resistance. The pile driving contractor should submit a list of proposed driving equipment along with a wave equation analysis using GRLWEAP to assess the suitability of the driving system. The driving criteria should be developed using CAPWAP signal matching results within a refined WEAP run for the test pile to account for the actual driving conditions. All pile driving and monitoring requirements for the installation of piles should be in accordance with VDOT Road and Bridge Construction Specifications 2020.

We recommend that a minimum of two dynamic load tests with signal matching be performed for abutment B before driving production piles. The test piles should be driven to the nominal driving resistance required per pile (R_{ndr}) as indicated in the section above. The test piles should be installed with the same equipment used for the wave equation analysis and the production piles. Test piles may be used as production piles.

Production piles should be driven utilizing the same hammer and equipment as the test pile and be based on the driving criteria established with the test pile program. If the pile driving contractor changes hammer, cushion or driving methods, a revised wave equation should be submitted and an additional dynamic load test should be performed.

During pile driving, the depth of embedment, blow counts, driving rate, and the driving records should be verified. The sequence of driving piles in groups can affect the pile lengths and driving resistances due to ground densification. We recommend that the piles in the centers of a pile group be driven first.

After the initial installation of test piles, the piles should set for a minimum of 72 hours so excessive pore pressure caused by driving operations can dissipate and the soils can set-up around the piles. After the waiting period, the piles should be re-driven to see if they have achieved the required nominal pile driving resistance.

Consideration of Existing Structures

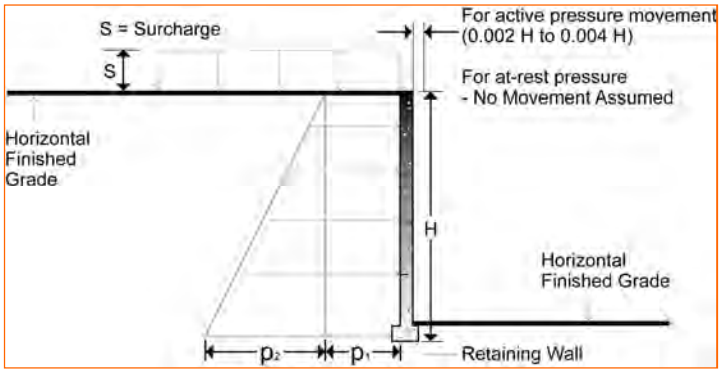
A pre-condition survey of the structures (existing bridges, utilities, and buildings) near the North Abutment should be completed prior to pile installation of pile foundation. The existing structures should be monitored during the pile driving for indications of movement or cracks. Pile driving should be stopped if the vibration level near the existing structures reaches above 0.5 inches. The potential impact of driving piles at this site should be considered when evaluating this alternative.

The pile driving process should be performed under the direction of the Geotechnical Engineer. The Geotechnical Engineer should document the pile installation process including soil and groundwater conditions encountered, consistency with expected conditions, and details of the installed pile.

LATERAL EARTH PRESSURES

Design Parameters

Structures with unbalanced backfill levels on opposite sides should be designed for earth pressures at least equal to values indicated in the Table 1 provided in **Supporting Documents**. Earth pressures will be influenced by structural design of the walls, conditions of wall restraint, methods of construction and/or compaction and the strength of the materials being restrained. Two wall restraint conditions are shown in the diagram below. Active earth pressure is commonly used for design of free-standing cantilever retaining walls and assumes wall movement. The “at-rest” condition assumes no wall movement and is commonly used for walls restrained at the top such as abutment walls. The recommended design lateral earth pressures do not include a factor of safety and do not provide for possible hydrostatic pressure on the walls (unless stated). Hydrostatic pressures are not included in the latreal pressure calculations assuming relatively granular or free draining backfill material will be used behind the abutments.



Backfill placed against structures should consist of granular soils or low plasticity cohesive soils. For the granular values to be valid, the granular backfill must extend out and up from the base of the wall at an angle of at least 45 and 60 degrees from vertical for the active and passive cases, respectively.

The lateral earth pressures shown in Table 1 are applicable only to cases where a subdrainage system is installed as per VDOT Specification. Hydrostatic pressures are not included in the lateral earth pressures assuming the use of relatively granular or free draining backfill, and subdrainage (weepholes) at the base of walls below grade.

Equivalent fluid pressure factors should be calculated by multiplying earth pressure coefficient with unit weight for the respective backfill conditions. Where applicable, the design should consider surcharge loads using a rectangular earth pressure distribution. The surcharge pressure ordinate should be obtained by multiplying the surface surcharge pressure (q) by the lateral earth pressure coefficient in Table 1 for the respective backfill condition. In addition to static earth pressures, the structural designer should consider dynamic earth pressures due to seismic loading, as applicable

GLOBAL STABILITY ANALYSES

Mechanics of Stability

Global stability analyses take into consideration material strength, presence and orientation of weak layers, water (piezometric) pressures, surcharge loads, and the slope geometry. Mathematical computations are performed using computer-assisted simulations to calculate a Factor of Safety (FS). Minor changes to slope geometry, surface water flow and/or groundwater levels could result in slope instability. Factor of Safety values are dependent upon the confidence in the parameters utilized in the analyses performed, among other factors related to the project itself.

The stability analysis was conducted using the computer program Slope/W Version 9.0.3.15488 developed by Geo-Slope International. This computer program was used to generate potential

failure surfaces with randomly selected radii and centers. The stability analysis was performed assuming static loading for drained (long-term) soil conditions. Slope stability analysis was not analyzed for dynamic loading. A search for the most critical potential failure surfaces occurring within earth materials in the proposed slope was performed using circular failure mode as calculated by the Spencer method. A surcharge load of 75 psf was used for pedestrian traffic where applicable.

Slope stability analyses were performed for the profiles and cross-section drawings obtained from the 30 percent plans.

Analyses Results

The stability of the slopes at the cross-section locations shown on the **Exploration Plan** were analyzed based on the provided topography and proposed grading. Soil properties used in the analyses are provided in Table 1.

Based on the analyses, the calculated FS for the critical surface identified in each section is shown below. As per VDOT (MOI chapter III) the minimum FS for global stability for structures is 1.5. The slope stability results are included in **Supporting Information**.

Cross-Section	Loading Condition	Minimum Calculated Factor-of-Safety for Slopes	
		Circular Failure Surface	Optimized Failure Surface
B-B', North Abutment	Long-Term	1.8	1.8
	Short-Term	2.0	1.9

TRAIL PAVEMENT

About 75 feet of at-grade trail is planned to connect the Abutment B to the existing sidewalk at Shirlington Road.

Proposed trail subgrades are expected to consist of firm existing fill, natural soils, or new compacted fill. These materials are generally considered suitable for support of the planned trail. However, where trail subgrades consist of unsuitable soils (Soft, loose, or highly plastic soils), we recommend budgeting for undercutting the unsuitable soils to a depth of at least 1 foot and backfilling with new compacted fill with a minimum CBR value of 5.0. The decision to undercut the existing fill should be based on a thorough proofroll of the pavement subgrades under the observation of the geotechnical engineer.

Minimum rigid and flexible pavement sections that may be required for the trail are presented below. Control of both surface water and groundwater is an important consideration for design and construction with respect to the overall performance of trail. The minimum pavement sections require that proper grading be maintained to direct surface water away from paved areas and to provide for efficient runoff from surrounding areas.

- Rigid Pavement:
  - Surface: 4 inches Portland Cement Concrete
  - Subbase: 4 inches Type I, VDOT No. 21B
- Flexible Pavement:
  - Surface: 2 inches SM 9.5D
  - Subbase: 8 inches Type I, VDOT No. 21B

GENERAL COMMENTS

Our analysis and opinions are based upon our understanding of the project, the geotechnical conditions in the area, and the data obtained from our site exploration. Natural variations will occur between exploration point locations or due to the modifying effects of construction or weather. The nature and extent of such variations may not become evident until during or after construction. Terracon should be retained as the Geotechnical Engineer, where noted in this report, to provide observation and testing services during pertinent construction phases. If variations appear, we can provide further evaluation and supplemental recommendations. If variations are noted in the absence of our observation and testing services on-site, we should be immediately notified so that we can provide evaluation and supplemental recommendations.

Our Scope of Services does not include either specifically or by implication any environmental or biological (e.g., mold, fungi, bacteria) assessment of the site or identification or prevention of pollutants, hazardous materials or conditions. If the owner is concerned about the potential for such contamination or pollution, other studies should be undertaken.

Our services and any correspondence or collaboration through this system are intended for the sole benefit and exclusive use of our client for specific application to the project discussed and are accomplished in accordance with generally accepted geotechnical engineering practices with no third-party beneficiaries intended. Any third-party access to services or correspondence is solely for information purposes to support the services provided by Terracon to our client. Reliance upon the services and any work product is limited to our client, and is not intended for third parties. Any use or reliance of the provided information by third parties is done solely at their own risk. No warranties, either express or implied, are intended or made.

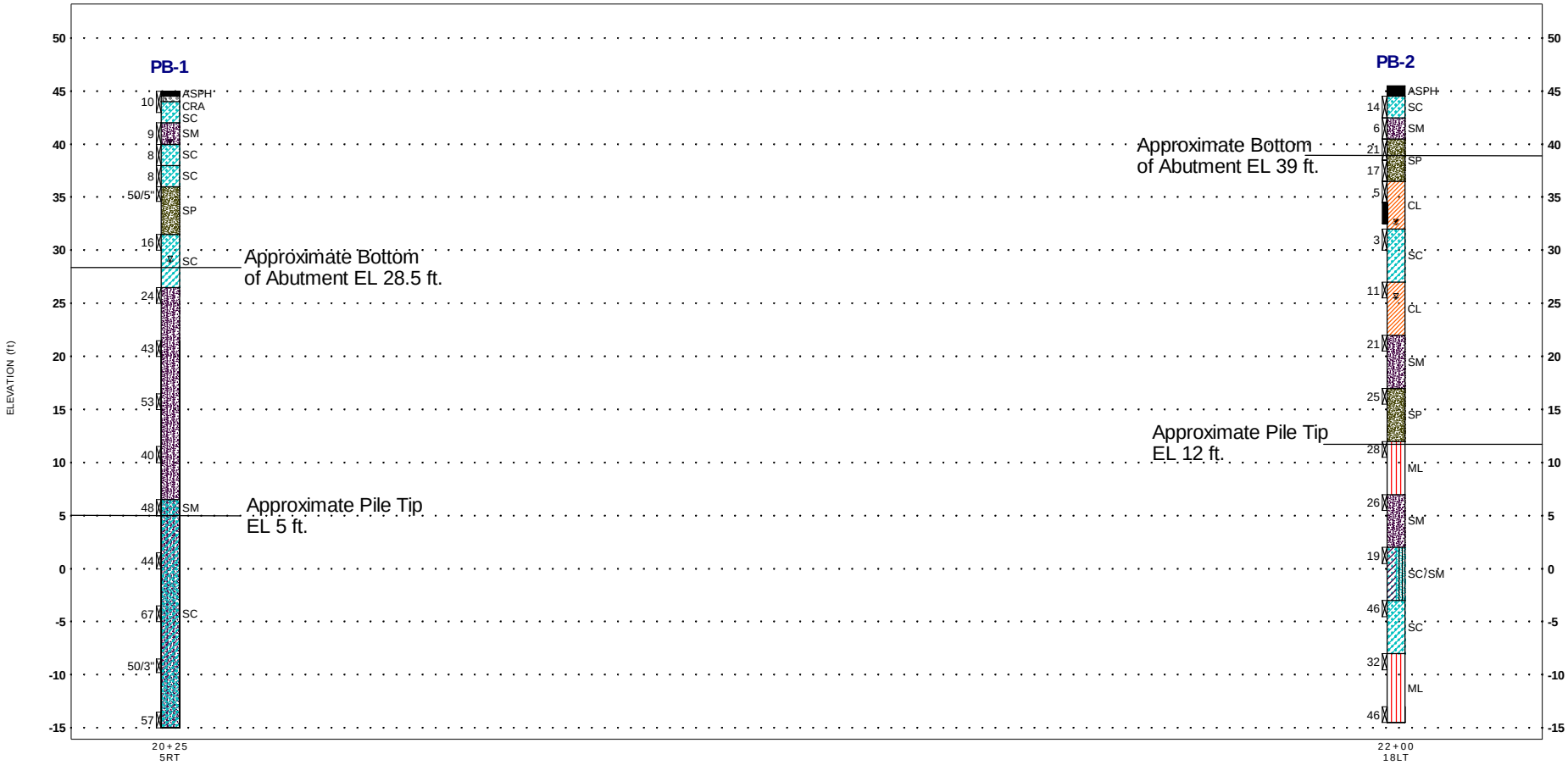
Site characteristics as provided are for design purposes and not to estimate excavation cost. Any use of our report in that regard is done at the sole risk of the excavating cost estimator as there may be variations on the site that are not apparent in the data that could significantly impact excavation cost. Any parties charged with estimating excavation costs should seek their own site characterization for specific purposes to obtain the specific level of detail necessary for costing. Site safety, and cost estimating including, excavation support, and dewatering requirements/design are the responsibility of others. If changes in the nature, design, or location of the project are planned, our conclusions and recommendations shall not be considered valid unless we review the changes and either verify or modify our conclusions in writing.

FIGURES

Contents:

Note: All attachments are one page unless noted above.

FHWA REGION	STATE	FEDERAL AID ROUTE	FEDERAL AID PROJECT	STATE ROUTE	STATE PROJECT	SHEET NO.
3	VA.					



Notes: See borehole logs for complete data
See Material and Sample Symbols List

The subsurface information shown on the boring logs in these plans was obtained with reasonable care and recorded in good faith solely for use by the Department in establishing design controls for the project. The Department has no reason to suspect that such information is not reasonably accurate as an approximate indication of the subsurface conditions at the sites where the borings were taken. The Department does not in any way warrant or guarantee that such data can be projected as indicative of conditions beyond the limits of the borings shown; and any such projections by bidders are purely interpretive and altogether speculative. Further, the Department does not in any way guarantee, either expressly or by implication, the sufficiency of the information for bid purposes.

The boring logs are made available to bidders in order that they may have access to subsurface data identical to that which is possessed by the Department, and are not intended as a substitute for personal investigation, interpretation and judgment by the bidders.

No.	Description	Date
	Revisions	

COMMONWEALTH OF VIRGINIA
DEPARTMENT OF TRANSPORTATION

MATERIALS DIVISION

JD205151
ENGINEERING GEOLOGY

Drilled:	Date	Plan No.	Sheet No.
Logged:			
Checked:			

SPT_FENCEALSHRLINGTON VDOT LOGS.GPJ 10.0.1.00.1102101 2/1/21

ATTACHMENTS

EXPLORATION AND TESTING PROCEDURES

Field Exploration

Number of Borings	Boring Depth (feet)	Planned Location
2	60	pedestrian bridge

Boring Layout and Elevations: Unless otherwise noted, Terracon personnel provided the boring layout. Coordinates were obtained with a handheld GPS unit (estimated horizontal accuracy of about ±10 feet) and approximate elevations were obtained by interpolation from the Plan and Profile drawing, dated January 24, 2020. If elevations and a more precise boring layout are desired, we recommend borings be surveyed following completion of fieldwork.

Subsurface Exploration Procedures: We advanced the borings with a track-mounted rotary drill rig using continuous flight augers (solid stem and/or hollow stem, as necessary, depending on soil conditions). Five samples were obtained in the upper 10 feet of each boring and at intervals of 5 feet thereafter. In the thin-walled tube sampling procedure, a thin-walled, seamless steel tube with a sharp cutting edge was pushed hydraulically into the soil to obtain a relatively undisturbed sample. In the split-barrel sampling procedure, a standard 2-inch outer diameter split-barrel sampling spoon was driven into the ground by a 140-pound automatic hammer falling a distance of 30 inches. The number of blows required to advance the sampling spoon the last 12 inches of a normal 18-inch penetration or middle 12 inches of 24-inch penetration is recorded as the Standard Penetration Test (SPT) resistance value. The SPT resistance values, also referred to as N-values, are indicated on the boring logs at the test depths. We observed and recorded groundwater levels during drilling and sampling. For safety purposes, all borings were backfilled with auger cuttings after their completion. Pavements were patched with cold-mix asphalt and/or pre-mixed concrete, as appropriate.

The sampling depths, penetration distances, and other sampling information was recorded on the field boring logs. The samples were placed in appropriate containers and taken to our soil laboratory for testing and classification by a Geotechnical Engineer. Our exploration team prepared field boring logs as part of the drilling operations. These field logs included visual classifications of the materials encountered during drilling and our interpretation of the subsurface conditions between samples. Final boring logs were prepared from the field logs. The final boring logs represent the Geotechnical Engineer's interpretation of the field logs and include modifications based on observations and tests of the samples in our laboratory.

Laboratory Testing

The project engineer reviewed the field data and assigned laboratory tests to understand the engineering properties of the various soil strata, as necessary, for this project. Procedural standards noted below are for reference to methodology in general. In some cases, variations to

methods were applied because of local practice or professional judgment. Standards noted below include reference to other, related standards. Such references are not necessarily applicable to describe the specific test performed.

- ASTM D2216 Standard Test Methods for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass
- ASTM D4318 Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils
- ASTM D422 Standard Test Method for Particle-Size Analysis of Soils
- AASHTO T289 Standard Test Method for pH Analysis of Soils
- AASHTO T290 Standard Test Method for Water-Soluble Sulfate Ion Content in Soils
- AASHTO T291 Standard Test Method for Water-Soluble Chloride Ion Content in Soils
- AASHTO T288 Standard Test Method for Soil Resistivity

The laboratory testing program often included examination of soil samples by an engineer. Based on the material's texture and plasticity, we described and classified the soil samples in accordance with the Unified Soil Classification System.

SITE LOCATION AND EXPLORATION PLANS

Contents:

Site Location Plan
Exploration Plan

Note: All attachments are one page unless noted above.

SITE LOCATION

Shirlington Road Pedestrian Bridge ■ Shirlington, Arlington County, Virginia
February 11, 2021 ■ Terracon Project No. JD205151

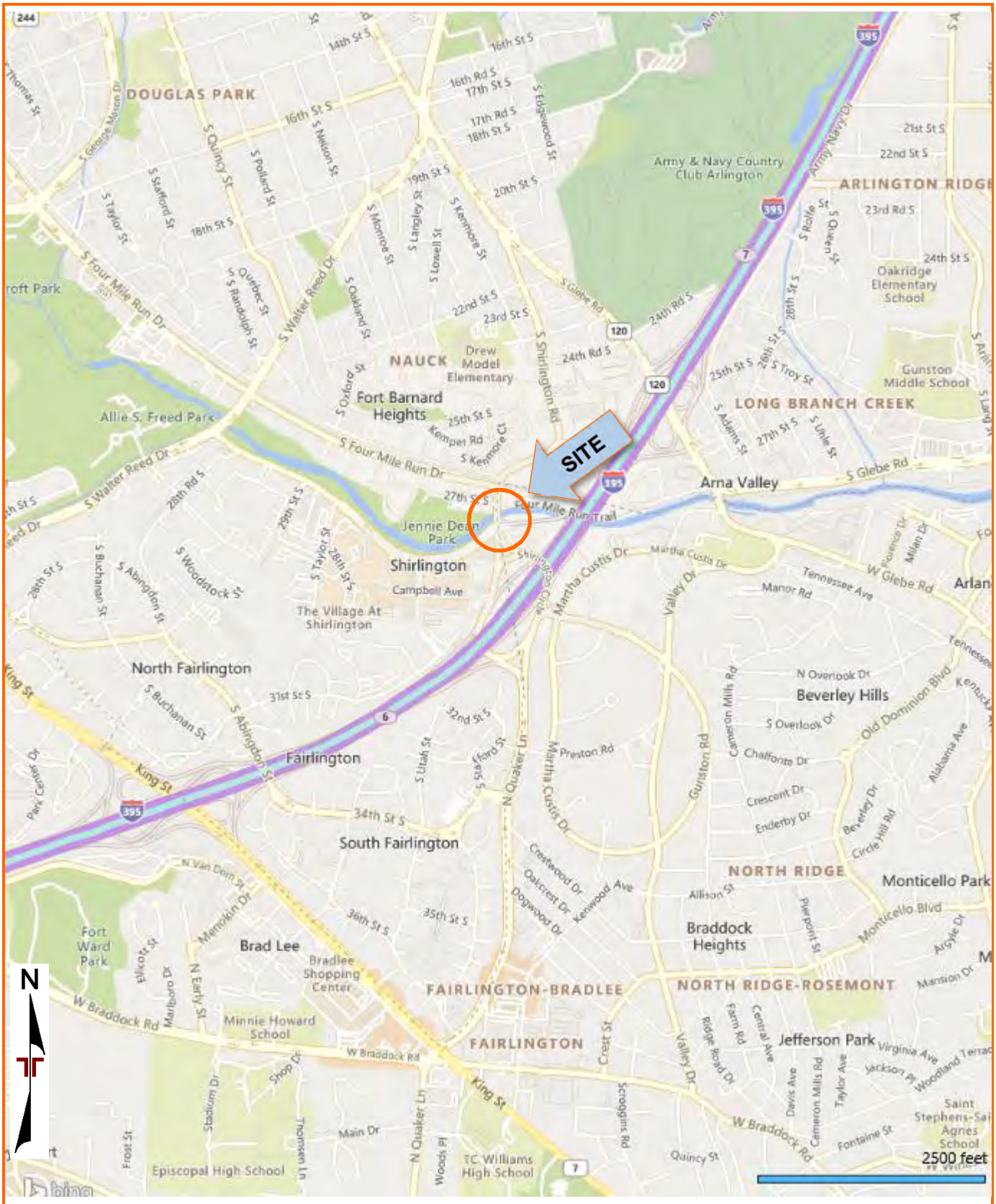


DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

MAP PROVIDED BY MICROSOFT BING MAPS

EXPLORATION PLAN

Shirlington Road Pedestrian Bridge ■ Shirlington, Arlington County, Virginia
February 11, 2021 ■ Terracon Project No. JD205151

DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

MAP PROVIDED BY MICROSOFT BING MAPS

EXPLORATION RESULTS

Contents:

Note: All attachments are one page unless noted above.

VDOT Virginia Department of Transportation

PROJECT #: JD205151
LOCATION: Shirlington Rd, Arlington, VA
STRUCTURE: ABUTMENT A

PB-1
PAGE 1 OF 2

STATION: 20+25 OFFSET: 5RT
LATITUDE: 38.842957° N LONGITUDE: 77.085908° W
SURFACE ELEVATION: 45.0 ft COORD. DATUM: NAD 83

Date(s) Drilled: 10/09/2020 - 10/09/2020
Drilling Method(s): 3.25" ID HSA
SPT Method: Automatic Hammer
Other Test(s): Not Applicable
Driller: Terracon (A. Fowler)
Logger: GeoConcepts (A. Seip)

GROUND WATER
FIRST ENCOUNTERED AT 16.0 ft DEPTH
STABILIZED AT 5.0 ft AFTER 0 HOURS

FIELD DATA / **LAB DATA**

PKT. PENETROMETER (tsf)	DEPTH (ft)	ELEVATION (ft)	SOIL: STANDARD PENETRATION TEST HAMMER BLOWS	SOIL: SOIL RECOVERY (%)	SOIL: SAMPLE LEGEND	SOIL: SAMPLE INTERVAL	ROCK: CORE RECOVERY (%)	ROCK: ROCK QUALITY DESIGNATION	ROCK: DIP ° STRATA	ROCK: DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT LL	PLASTICITY INDEX PI	MOISTURE CONTENT (%)	FINES CONTENT #200 (%)
			2 4 6 9	100		2						0.0 / 45.0 Asphalt = 6 in. **ASPH**			14.9	
	2											0.5 / 44.5 Crushed stone = 6 in. **CRA**				
	4		3 4 5 7	100		3						1.0 / 44.0 *Fill*, light gray-brown, fine to coarse, CLAYEY SAND WITH GRAVEL, medium dense, moist **SC**			16.2	
	6	40	3 4 4 6	100		5						3.0 / 42.0 *Fill*, gray, fine to coarse, SILTY SAND WITH GRAVEL, medium dense, moist **SM**	44	25	17.0	39.7
0.5	8		8 4 4 2	100		7						5.0 / 40.0 *Fill*, red-brown, fine to coarse, CLAYEY SAND, medium dense, moist **SC**			19.1	
	10	35	15 27 50/5"	100		9						7.0 / 38.0 *Alluvium*, light gray-orange and red, fine to coarse, CLAYEY SAND WITH GRAVEL, medium dense, moist **SC**			2.3	
	12					10.4										
	14		7 7 9	100		13.5						9.0 / 36.0 *Alluvium*, light gray light brown, fine to coarse, POORLY GRADED SAND WITH GRAVEL, very dense, moist **SP**	37	20	21.5	77.5
	16	30				15										
	18		8 8 16	100		18.5						13.5 / 31.5 *Alluvium*, light brown, fine to coarse, CLAYEY SAND, medium dense, moist **SC**			20.3	
	20	25				20						18.5 / 26.5 *Potomac Formation*, light blue-gray, SILTY SAND, dense, moist **SM**				
	22															
	24		8 18 25	100		23.5						23.5 / 21.5 SAME: below 23.5 ft. very dense	31	8	19.8	21.6
	26	20				25										
	28		18 23 30	100		28.5									16.4	
	30	15				30										
	32															
	34		6 16 24	100		33.5									18.7	
	36	10				35										
	38															
1.5	40	5	8 20 28	100		38.5						38.5 / 6.5 *Potomac Formation*, light blue gray, fine to coarse,	29	9	21.1	15.3

REMARKS: Rig Type: D 50. Cave-in at 10 ft.

PAGE 1 OF 2
PB-1

SPT_LOGAB:SHIRLINGTON VDOT LOGS.GPJ:10.01.00.11:021011:2/11/21

VDOT Virginia Department of Transportation

PROJECT #: JD205151
LOCATION: Shirlington Rd, Arlington, VA
STRUCTURE: ABUTMENT A

PB-1
PAGE 2 OF 2

STATION: 20+25 OFFSET: 5RT
LATITUDE: 38.842957° N LONGITUDE: 77.085908° W
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FIELD DATA

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Other Test(s): Not Applicable
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GROUND WATER
FIRST ENCOUNTERED AT 16.0 ft DEPTH
STABILIZED AT 5.0 ft AFTER 0 HOURS

LAB DATA

PKT. PENETROMETER (tsf)	DEPTH (ft)	ELEVATION (ft)	SOIL: STANDARD PENETRATION TEST HAMMER BLOWS	SOIL: SOIL RECOVERY (%)	SOIL: SAMPLE LEGEND	SOIL: SAMPLE INTERVAL	ROCK: CORE RECOVERY (%)	ROCK: ROCK QUALITY DESIGNATION	ROCK: DIP ° STRATA	ROCK: DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT LL	PLASTICITY INDEX PI	MOISTURE CONTENT (%)	FINES CONTENT -#200 (%)
	40											CLAYEY SAND, very dense, moist **SC**				
	42															
1.25	44	0	10 17 27	100		43.5 45									20.3	
	46															
	48		17 27 40	100		48.5 50									18.8	
2	50	-5														
	52															
3	54		20 40 50/3"	100		53.5 54.8									18.3	
	56	-10														
	58															
2.5	60	-15	9 23 34	100		58.5 60						Bottom of borehole at 60.0 ft.			22.0	

REMARKS: Rig Type: D 50. Cave-in at 10 ft.

PAGE 2 OF 2
PB-1

SPT_LOGAB:SHIRLINGTON VDOT LOGS.GPJ:10.01.00.11:021011:2/11/21

VDOT Virginia Department of Transportation

PROJECT #: JD205151
LOCATION: Shirlington Rd, Arlington, VA
STRUCTURE: ABUTMENT B

PB-2
PAGE 1 OF 2

STATION: 22+00 OFFSET: 18LT
LATITUDE: 38.843420° N LONGITUDE: 77.086043° W
SURFACE ELEVATION: 45.5 ft COORD. DATUM: NAD 83

Date(s) Drilled: 10/08/2020 - 10/08/2020
Drilling Method(s): 3.25" ID HSA
SPT Method: Automatic Hammer
Other Test(s): Not Applicable
Driller: Terracon (A. Fowler)
Logger: GeoConcepts (A. Seip)

GROUND WATER
FIRST ENCOUNTERED AT 20.0 ft DEPTH
STABILIZED AT 13.0 ft AFTER 0 HOURS

FIELD DATA / **LAB DATA**

PKT. PENETROMETER (tsf)	DEPTH (ft)	ELEVATION (ft)	SOIL: STANDARD PENETRATION TEST HAMMER BLOWS	SOIL: SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	ROCK: CORE RECOVERY (%)	ROCK: ROCK QUALITY DESIGNATION	ROCK: DIP ° STRATA	ROCK: DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LAB: LIQUID LIMIT LL	LAB: PLASTICITY INDEX PI	LAB: MOISTURE CONTENT (%)	LAB: FINES CONTENT #200 (%)
		45	5 7 7 8	65		1						0.0 / 45.5 Asphalt = 12 in. **ASPH**				
0.25	2											1.0 / 44.5 *Fill*, red-brown and gray, fine to coarse, micaceous, medium dense, moist **SC**			13.0	
0.75	4		3 3 3 7	55		3									14.8	
	6	40	5 9 12 14	65		5						3.0 / 42.5 *Fill*, red-brown and gray, fine to coarse, SILTY SAND WITH GRAVEL, micaceous, loose, moist **SM**			4.0	
	8		16 11 6 5	50		7						5.0 / 40.5 *Residual*, light brown white, medium to coarse, POORLY GRADED SAND WITH GRAVEL, medium dense, moist **SP**			9.9	
1	10	35	2 2 3 5	65		9						9.0 / 36.5 *Alluvium*, gray light brown, SANDY LEAN CLAY, micaceous, firm, moist **CL**	47	24	21.2	60.2
1	12					11										
1.25						13										
	14		0 0 3 5	100		13.5						13.5 / 32.0 *Potomac Formation*, orange-brown, fine to medium, CLAYEY SAND, loose, moist **SC**			23.6	
	16	30				15.5										
	18					18.5										
2.25	20		5 5 6	100		20						18.5 / 27.0 *Potomac Formation*, gray, fine to medium, SANDY LEAN CLAY, medium dense, moist **CL**			21.8	
	22	25														
	24		5 9 12	100		23.5						23.5 / 22.0 *Potomac Formation*, light gray-brown, fine to coarse, SILTY SAND, medium dense, moist **SM**			23.6	
	26	20				25										
	28					28.5										
	30		9 10 15	100		30						28.5 / 17.0 *Potomac Formation*, light gray-brown, medium to coarse, POORLY GRADED SAND, dense, moist, with silt **SP**			23.1	76.9
	32	15														
3.5	34		8 13 15	100		33.5						33.5 / 12.0 *Potomac Formation*, dark gray, SANDY SILT, hard, moist **ML**	46	17	24.1	37.7
	36	10				35										
	38					38.5										
2.5	40		7 11 15	100								38.5 / 7.0 *Potomac Formation*, gray-blue, fine to medium, SILTY			24.3	

REMARKS: Rig Type: D 50. Standpipe installed.
Cave-in at 10 ft.

SPT_LOGAB:SHIRLINGTON VDOT LOGS.GPJ:10.01.00.11:021011:2/11/21

Virginia Department of Transportation

PROJECT #: JD205151
LOCATION: Shirlington Rd, Arlington, VA
STRUCTURE: ABUTMENT B

PB-2
PAGE 2 OF 2

STATION: 22+00 OFFSET: 18LT
LATITUDE: 38.843420° N LONGITUDE: 77.086043° W
SURFACE ELEVATION: 45.5 ft COORD. DATUM: NAD 83

Date(s) Drilled: 10/08/2020 - 10/08/2020
Drilling Method(s): 3.25" ID HSA
SPT Method: Automatic Hammer
Other Test(s): Not Applicable
Driller: Terracon (A. Fowler)
Logger: GeoConcepts (A. Seip)

GROUND WATER
FIRST ENCOUNTERED AT 20.0 ft DEPTH
STABILIZED AT 13.0 ft AFTER 0 HOURS

FIELD DATA / **LAB DATA**

PKT. PENETROMETER (tsf)	DEPTH (ft)	ELEVATION (ft)	SOIL: STANDARD PENETRATION TEST HAMMER BLOWS	SOIL: SOIL RECOVERY (%)	SOIL: SAMPLE LEGEND	SOIL: SAMPLE INTERVAL	ROCK: CORE RECOVERY (%)	ROCK: ROCK QUALITY DESIGNATION	ROCK: DIP ° STRATA	ROCK: DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LAB: LIQUID LIMIT (LL)	LAB: PLASTICITY INDEX (PI)	LAB: MOISTURE CONTENT (%)	LAB: FINES CONTENT -#200 (%)
	40	5										SAND, dense, moist **SM**				
	42															
1	43.5		4 7 12	100		43.5 45						43.5 / 2.0 *Potomac Formation*, gray-blue, SILTY CLAYEY SAND, micaceous, very stiff, moist, with silt **SC/SM**	29	7	29.0	62.9
	44															
	46	0														
	48															
1.5	48.5		7 21 25	100		48.5 50						48.5 / -3.0 *Potomac Formation*, gray, medium to coarse, CLAYEY SAND, very dense, moist **SC**			16.8	
	50	-5														
	52															
4.5	53.5		9 13 19	100		53.5 55						53.5 / -8.0 *Potomac Formation*, dark gray, fine to medium, SILT WITH SAND, hard to very hard, moist **ML**			24.0	
	54															
	56	-10														
	58															
4.5	58.5		5 21 25	100		58.5 60						58.5 / -13.0 SAME: below 58.5 ft. very hard			21.4	
	60											Bottom of borehole at 60.0 ft.				

REMARKS: Rig Type: D 50. Standpipe installed.
Cave-in at 10 ft.

PAGE 2 OF 2
PB-2

SPT_LOGAB:SHIRLINGTON VDOT LOGS.GPJ:10.01.00.11:021011:2/11/21

SUMMARY OF LABORATORY RESULTS

BORING ID	Depth (Ft.)	Soil Classification USCS	Water Content (%)	Liquid Limit	Plastic Limit	Plasticity Index	% Gravel	% Sand	% Fines	% Clay	% Silt
PB-1	0 - 2		14.9								
PB-1	3 - 5		16.2								
PB-1	5 - 7	CLAYEY SAND(SC)	17	44	19	25	3.4	56.9	39.7		
PB-1	7 - 9		19.1								
PB-1	9 - 10.42		2.3								
PB-1	13.5 - 15	CLAYEY SAND(SC)	21.5	37	17	20	3.5	77.5	19.0	7.1	12.0
PB-1	18.5 - 20		20.3								
PB-1	23.5 - 25	SILTY SAND(SM)	19.8	31	23	8	0.0	78.4	21.6	0.3	21.4
PB-1	28.5 - 30		16.4								
PB-1	33.5 - 35		18.7								
PB-1	38.5 - 40	CLAYEY SAND(SC)	21.1	29	20	9	2.5	82.2	15.3	0.2	15.1
PB-1	43.5 - 45		20.3								
PB-1	48.5 - 50		18.8								
PB-1	53.5 - 54.75		18.3								
PB-1	58.5 - 60		22								
PB-2	1 - 3		13								
PB-2	3 - 5		14.8								
PB-2	5 - 7		4								
PB-2	7 - 9		9.9								
PB-2	9 - 11	SANDY LEAN CLAY(CL)	21.2	47	23	24	0.0	39.8	60.2	9.1	51.1
PB-2	13.5 - 15.5		23.6								
PB-2	18.5 - 20		21.8								
PB-2	23.5 - 25		23.6								
PB-2	28.5 - 30		23.1				9.1	76.9	14.0	4.6	9.4
PB-2	33.5 - 35	SANDY SILT(ML)	24.1	46	29	17	0.0	37.7	62.3		
PB-2	38.5 - 40		24.3								
PB-2	43.5 - 45	SILTY, CLAYEY SAND(SC-SM)	29	29	22	7	0.7	62.9	36.4		
PB-2	48.5 - 50		16.8								

PROJECT: Shirlington Road Pedestrian Bridge

SITE: Shirlington, VA

Terracon
19955 Highland Vista Dr Ste 170
Ashburn, VA
PH. 703-726-8030 FAX. 703-726-8032

PROJECT NUMBER: JD205151

CLIENT: Volkert, Inc.
Springfield, VA

EXHIBIT: B-1

SUMMARY OF LABORATORY RESULTS

BORING ID	Depth (Ft.)	Soil Classification USCS	Water Content (%)	Liquid Limit	Plastic Limit	Plasticity Index	% Gravel	% Sand	% Fines	% Clay	% Silt
PB-2	53.5 - 55		24								
PB-2	58.5 - 60		21.4								

PROJECT: Shirlington Road Pedestrian Bridge

SITE: Shirlington, VA

Terracon
19955 Highland Vista Dr Ste 170
Ashburn, VA
PH. 703-726-8030 FAX. 703-726-8032

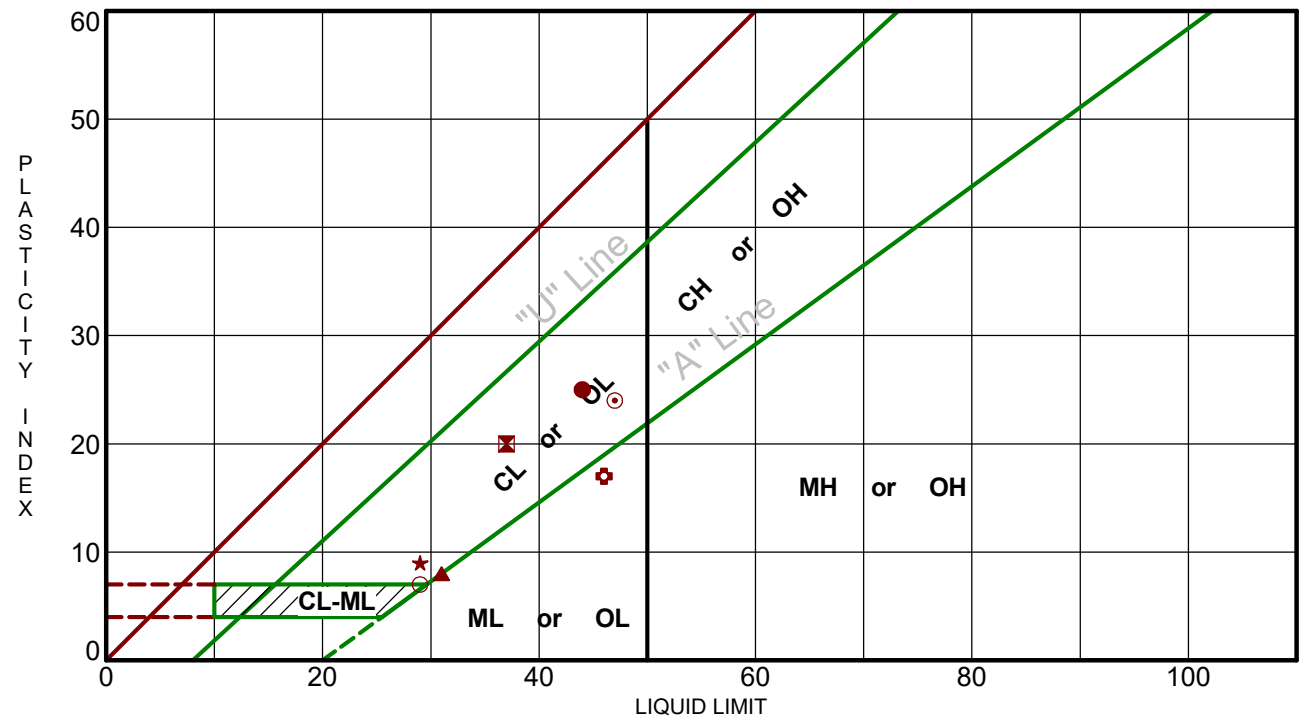
PROJECT NUMBER: JD205151

CLIENT: Volkert, Inc.
Springfield, VA

EXHIBIT: B-2

ATTERBERG LIMITS RESULTS

ASTM D4318



Boring ID	Depth	LL	PL	PI	Fines	USCS	Description
PB-1	5 - 7	44	19	25	39.7	SC	CLAYEY SAND
PB-1	13.5 - 15	37	17	20	19.0	SC	CLAYEY SAND
PB-1	23.5 - 25	31	23	8	21.6	SM	SILTY SAND
PB-1	38.5 - 40	29	20	9	15.3	SC	CLAYEY SAND
PB-2	9 - 11	47	23	24	60.2	CL	SANDY LEAN CLAY
PB-2	33.5 - 35	46	29	17	62.3	ML	SANDY SILT
PB-2	43.5 - 45	29	22	7	36.4	SC-SM	SILTY, CLAYEY SAND

PROJECT: Shirlington Road Pedestrian Bridge

SITE: Shirlington, VA

Terracon
19955 Highland Vista Dr Ste 170
Ashburn, VA

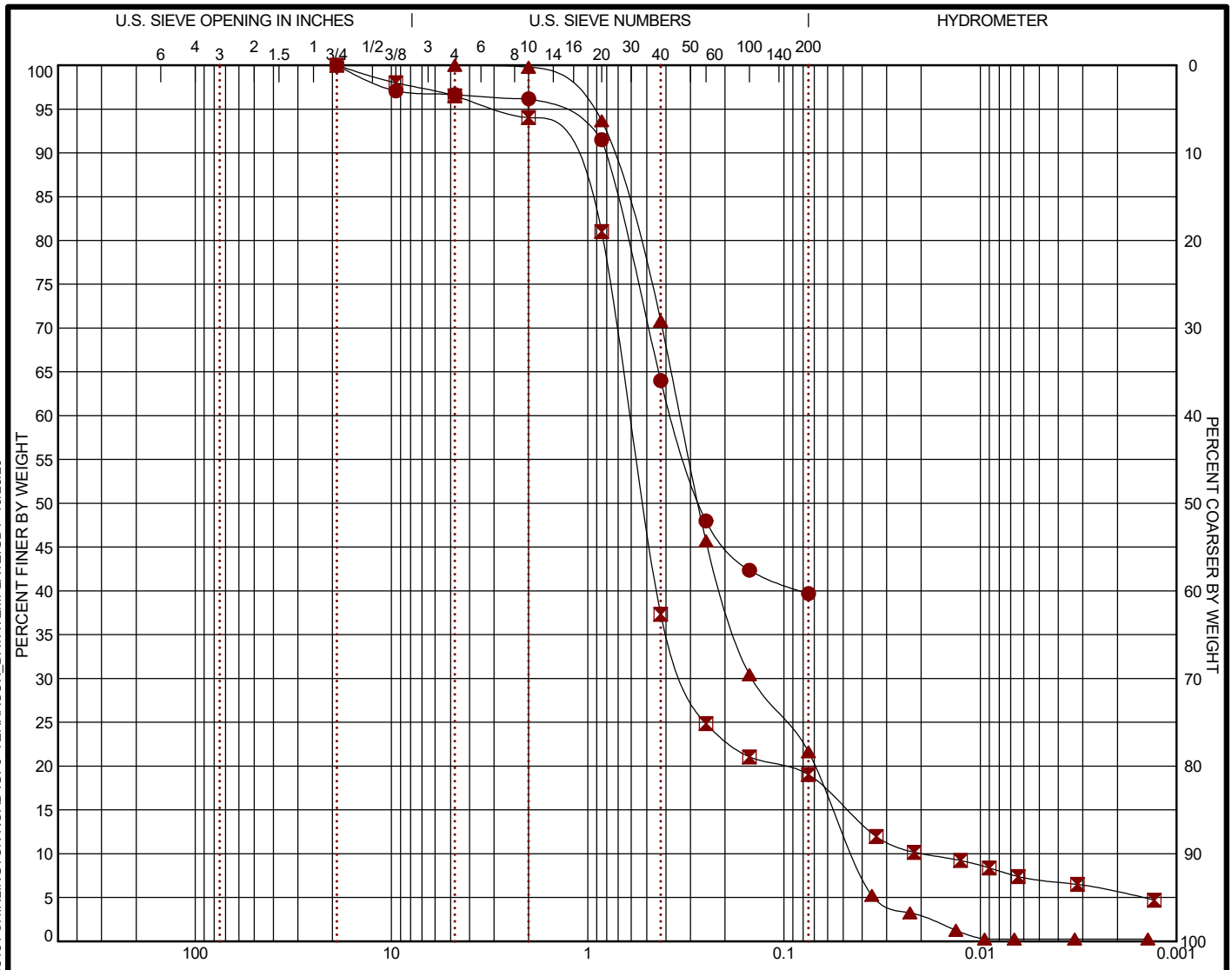
PROJECT NUMBER: JD205151

CLIENT: Volkert, Inc.
Springfield, VA

EXHIBIT: B-1

GRAIN SIZE DISTRIBUTION

ASTM D422 / ASTM C136



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BORING ID	DEPTH	% COBBLES	% GRAVEL	% SAND	% SILT	% FINES	% CLAY	USCS
●	**PB-1**	**5 - 7**	**0.0**	**3.4**	**56.9**		**39.7**		**SC**
⊠	**PB-1**	**13.5 - 15**	**0.0**	**3.5**	**77.5**	**12.0**		**7.1**	**SC**
▲	**PB-1**	**23.5 - 25**	**0.0**	**0.0**	**78.4**	**21.4**		**0.3**	**SM**

	GRAIN SIZE		
	●	⊠	▲
D_{60}	**0.372**	**0.609**	**0.338**
D_{30}		**0.311**	**0.145**
D_{10}		**0.02**	**0.044**
	COEFFICIENTS		
C_C		**8.09**	**1.40**
C_U		**31.00**	**7.64**

●		⊠		▲	
Sieve	% Finer	Sieve	% Finer	Sieve	% Finer
3/4"	**100.0**	**3/4"**	**100.0**	**#4**	**100.0**
3/8"	**97.08**	**3/8"**	**97.99**	**#10**	**99.79**
#4	**96.64**	**#4**	**96.49**	**#20**	**93.67**
#10	**96.18**	**#10**	**94.02**	**#40**	**70.82**
#20	**91.5**	**#20**	**81.01**	**#60**	**45.71**
#40	**64.01**	**#40**	**37.35**	**#100**	**30.44**
#60	**47.99**	**#60**	**24.86**	**#200**	**21.64**
#100	**42.36**	**#100**	**21.06**		
#200	**39.7**	**#200**	**19.04**		

SOIL DESCRIPTION
- ● CLAYEY SAND (SC)
- ⊠ CLAYEY SAND (SC)
- ▲ SILTY SAND (SM)

REMARKS
- ●
- ⊠
- ▲

PROJECT: Shirlington Road Pedestrian Bridge

SITE: Shirlington, VA

Terracon
19955 Highland Vista Dr Ste 170
Ashburn, VA

PROJECT NUMBER: JD205151

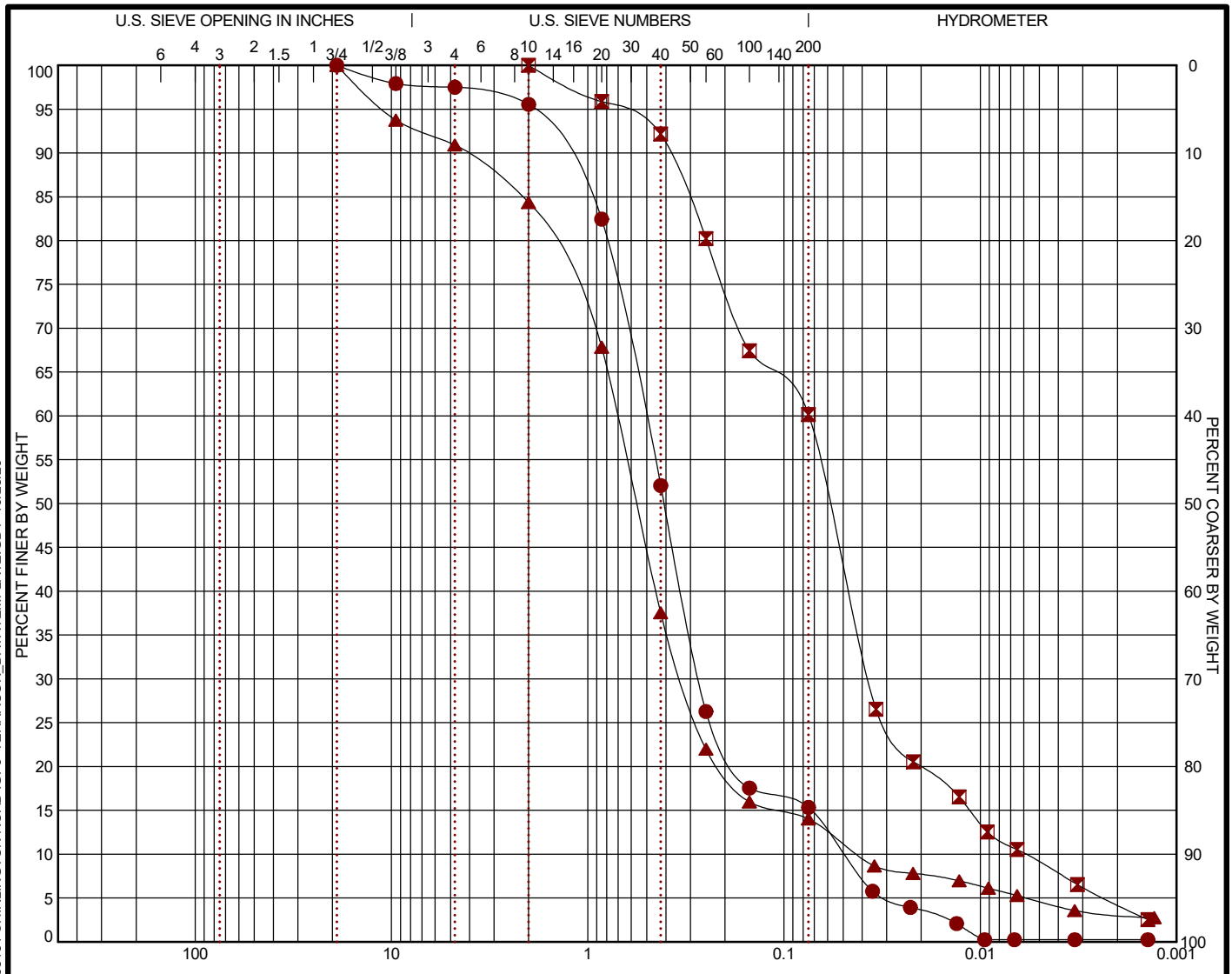
CLIENT: Volkert, Inc.
Springfield, VA

EXHIBIT: B-1

LABORATORY TESTS ARE NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GRAIN SIZE: USCS 1 JD205151 SHIRLINGTON ROAD .GPJ TERRACON_DATATEMPLATE.GDT 10/28/20

GRAIN SIZE DISTRIBUTION

ASTM D422 / ASTM C136



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BORING ID	DEPTH	% COBBLES	% GRAVEL	% SAND	% SILT	% FINES	% CLAY	USCS
●	**PB-1**	**38.5 - 40**	**0.0**	**2.5**	**82.2**	**15.1**		**0.2**	**SC**
⊠	**PB-2**	**9 - 11**	**0.0**	**0.0**	**39.8**	**51.1**		**9.1**	**CL**
▲	**PB-2**	**28.5 - 30**	**0.0**	**9.1**	**76.9**	**9.4**		**4.6**	

	GRAIN SIZE		
	●	⊠	▲
D_{60}	**0.509**	**0.075**	**0.71**
D_{30}	**0.27**	**0.037**	**0.329**
D_{10}	**0.049**	**0.006**	**0.042**
	COEFFICIENTS		
C_C	**2.90**	**3.08**	**3.62**
C_U	**10.33**	**12.63**	**16.93**

●		⊠		▲	
Sieve	% Finer	Sieve	% Finer	Sieve	% Finer
3/4"	100.0	#10	100.0	3/4"	100.0
3/8"	97.91	#20	95.86	3/8"	93.75
#4	97.49	#40	92.15	#4	90.91
#10	95.54	#60	80.23	#10	84.35
#20	82.45	#100	67.44	#20	67.84
#40	52.06	#200	60.16	#40	37.54
#60	26.28			#60	21.98
#100	17.55			#100	15.97
#200	15.34			#200	14.03

SOIL DESCRIPTION
- ● CLAYEY SAND (SC)
- ⊠ SANDY LEAN CLAY (CL)
- ▲

REMARKS
- ●
- ⊠
- ▲

PROJECT: Shirlington Road Pedestrian Bridge

SITE: Shirlington, VA

Terracon
19955 Highland Vista Dr Ste 170
Ashburn, VA

PROJECT NUMBER: JD205151

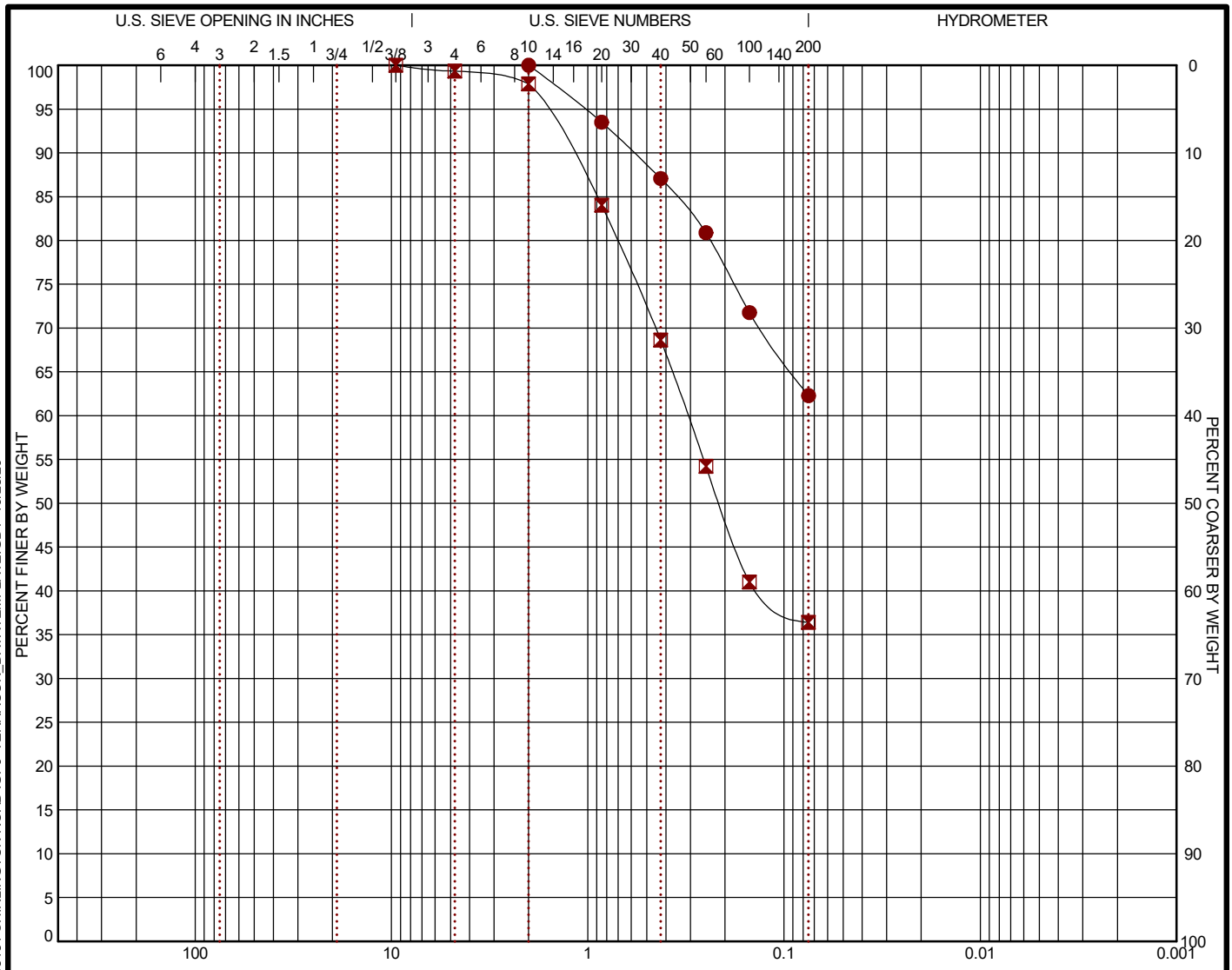
CLIENT: Volkert, Inc.
Springfield, VA

EXHIBIT: B-2

LABORATORY TESTS ARE NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GRAIN SIZE: USCS 1 JD205151 SHIRLINGTON ROAD .GPJ TERRACON_DATATEMPLATE.GDT 10/28/20

GRAIN SIZE DISTRIBUTION

ASTM D422 / ASTM C136



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BORING ID	DEPTH	% COBBLES	% GRAVEL	% SAND	% SILT	% FINES	% CLAY	USCS
●	**PB-2**	**33.5 - 35**	**0.0**	**0.0**	**37.7**		**62.3**		**ML**
⊠	**PB-2**	**43.5 - 45**	**0.0**	**0.7**	**62.9**		**36.4**		**SC-SM**

	GRAIN SIZE		
	●	⊠	
D_{60}		**0.309**	
D_{30}			
D_{10}			
	COEFFICIENTS		
C_C			
C_U			

●		⊠			
Sieve	% Finer	Sieve	% Finer	Sieve	% Finer
#10	**100.0**	**3/8"**	**100.0**		
#20	**93.5**	**#4**	**99.35**		
#40	**87.07**	**#10**	**97.86**		
#60	**80.89**	**#20**	**84.03**		
#100	**71.77**	**#40**	**68.62**		
#200	**62.29**	**#60**	**54.22**		
		#100	**41.01**		
		#200	**36.42**		

SOIL DESCRIPTION

● SANDY SILT (ML)

⊠ SILTY, CLAYEY SAND (SC-SM)

REMARKS

●

⊠

PROJECT: Shirlington Road Pedestrian Bridge

SITE: Shirlington, VA

Terracon
19955 Highland Vista Dr Ste 170
Ashburn, VA

PROJECT NUMBER: JD205151

CLIENT: Volkert, Inc.
Springfield, VA

EXHIBIT: B-3

LABORATORY TESTS ARE NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GRAIN SIZE: USCS 1 JD205151 SHIRLINGTON ROAD .GPJ TERRACON_DATATEMPLATE.GDT 10/28/20

750 Pilot Road, Suite F
Las Vegas, Nevada 89119
(702) 597-9393

Client
Volkert, Inc.
Springfield, VA

Project
Shirlington Road Pedestrian Bridge

Sample Submitted By: Terracon (JD) **Date Received:** 10/19/2020 **Lab No.: 20-1131**

Results of Corrosion Analysis

Sample Number	--	--	--	--
Sample Location	PB-2	PB-2	PB-2	PB-2
Sample Depth (ft.)	5.0-10.0	10.0-15.0	15.0-20.0	20.0-25.0
pH Analysis, AASHTO T 289	5.55	7.96	7.93	8.17
Water Soluble Sulfate (SO4), AASHTO T 290 (mg/Kg)	91	72	49	73
Chlorides, AASHTO T 291 (mg/kg)	291	45	43	32
Resistivity, AASHTO T 288, (ohm-cm)	600	1201	4336	2101

Analyzed By:
Trisha Campo
Chemist

750 Pilot Road, Suite F
Las Vegas, Nevada 89119
(702) 597-9393

Client
Volkert, Inc.
Springfield, VA

Project
Shirlington Road Pedestrian Bridge

Sample Submitted By: Terracon (JD) **Date Received:** 10/19/2020 **Lab No.: 20-1131**

Results of Corrosion Analysis

Sample Number	--
Sample Location	PB-2
Sample Depth (ft.)	25.0-30.0
pH Analysis, AASHTO T 289	7.33
Water Soluble Sulfate (SO4), AASHTO T 290 (mg/Kg)	43
Chlorides, AASHTO T 291 (mg/kg)	23
Resistivity, AASHTO T 288, (ohm-cm)	3568

Analyzed By: Trisha Campo
Chemist

SUPPORTING INFORMATION

Contents:

Note: All attachments are one page unless noted above.

UNIFIED SOIL CLASSIFICATION SYSTEM

UNIFIED SOIL CLASSIFICATION AND SYMBOL CHART

COARSE-GRAINED SOILS
(more than 50% of material is larger than No. 200 sieve size.)

GRAVELS More than 50% of coarse fraction larger than No. 4 sieve size	Clean Gravels (Less than 5% fines)		
	GW	Well-graded gravels, gravel-sand mixtures, little or no fines
	GP	Poorly-graded gravels, gravel-sand mixtures, little or no fines
	Gravels with fines (More than 12% fines)		
	GM	Silty gravels, gravel-sand-silt mixtures
	GC	Clayey gravels, gravel-sand-clay mixtures
SANDS 50% or more of coarse fraction smaller than No. 4 sieve size	Clean Sands (Less than 5% fines)		
	SW	Well-graded sands, gravelly sands, little or no fines
	SP	Poorly graded sands, gravelly sands, little or no fines
	Sands with fines (More than 12% fines)		
	SM	Silty sands, sand-silt mixtures
	SC	Clayey sands, sand-clay mixtures

FINE-GRAINED SOILS
(50% or more of material is smaller than No. 200 sieve size.)

SILTS AND CLAYS Liquid limit less than 50%	ML	Inorganic silts and very fine sands, rock flour, silty of clayey fine sands or clayey silts with slight plasticity
	CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays
	OL	Organic silts and organic silty clays of low plasticity
SILTS AND CLAYS Liquid limit 50% or greater	MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts
	CH	Inorganic clays of high plasticity, fat clays
	OH	Organic clays of medium to high plasticity, organic silts
HIGHLY ORGANIC SOILS	PT	Peat and other highly organic soils

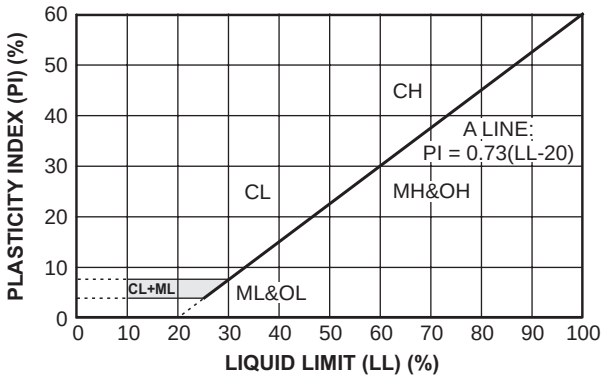
LABORATORY CLASSIFICATION CRITERIA

GW	$C_u = \frac{D_{60}}{D_{10}}$ greater than 4; $C_c = \frac{D_{30}}{D_{10} \times D_{60}}$ between 1 and 3	
GP	Not meeting all gradation requirements for GW	
GM	Atterberg limits below "A" line or P.I. less than 4	Above "A" line with P.I. between 4 and 7 are borderline cases requiring use of dual symbols
GC	Atterberg limits above "A" line with P.I. greater than 7	
SW	$C_u = \frac{D_{60}}{D_{10}}$ greater than 4; $C_c = \frac{D_{30}}{D_{10} \times D_{60}}$ between 1 and 3	
SP	Not meeting all gradation requirements for GW	
SM	Atterberg limits below "A" line or P.I. less than 4	Limits plotting in shaded zone with P.I. between 4 and 7 are borderline cases requiring use of dual symbols.
SC	Atterberg limits above "A" line with P.I. greater than 7	

Determine percentages of sand and gravel from grain-size curve. Depending on percentage of fines (fraction smaller than No. 200 sieve size), coarse-grained soils are classified as follows:

Less than 5 percent ..... GW, GP, SW, SP
More than 12 percent ..... GM, GC, SM, SC
5 to 12 percent ..... Borderline cases requiring dual symbols

PLASTICITY CHART



MATERIAL AND SAMPLE SYMBOLS LIST

Pavement/Soils

ASPH- ASPHALT PVT

GP - Poorly-graded Gravel

MH - Elastic Silt

SC - Clayey Sand

CH - Fat Clay

GP-GC

MH/CH

SM - Silty Sand

CL - Lean Clay

GP-GM

MH/ML

SP - Poorly-Graded Sand

CL-ML

GW - Well-Graded Gravel

MH/SM

SP-SC

CONC- CONCRETE PVT

GW-GC

ML - Silt

SP-SM

FL -Fill

GW-GM

ML/CL

SW - Well-Graded Sand

GC - Clayey Gravel

GM/GP

ML/GM

SW-SC

GC-GM

GM/ML

ML/SM

GM - Silty Gravel

GM/SM

SW-SM

Sedimentary Rocks

CGL - Conglomorate

SE - Shell Bed

CLST - Cherty Limestone

SHL - Shale

COL - Coal

SLS - Siltstone

MST Mudstone

SST - Sandstone

GWK - Graywacke

SST-SHL - Interbedded Sandstone/Shale

LST - Limestone

SST-SLS - Interbedded Sandstone/Siltstone

UCY - Underclay

SHLS-Shaly Limestone

SHDS Shaly Dolostone

MSH Silty Shale

CHK Chalk

SSHL Sandy Shale

Igneous Rocks

AND - Andesite

BST - Basalt

DBS - Diabase

DRT - Diorite

GBR - Gabbro

GRD - Granodiorite

GRN Granite

POR - Porphyry

RHY - Rhyolite

Metamorphic Rocks

GGE - Gouge

GNS - Gneiss

MYL - Mylonite

PHY - Phyllite

SCH - Schist

SLT - Slate

Misc.

CAV - Cavity

HWR Highly Weathered Rock

BRC - Breccia

Sampling

SPT

Core

Auger

Vane

Undisturbed

Grab

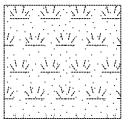
No Recovery

Other

MATERIAL AND SAMPLE SYMBOLS LIST

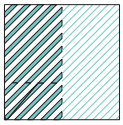
Pavement/Soils

TOPS-TOPSOIL



SC/CH

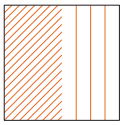
CH/CL



CH/MH

CH/SC

CL/ML



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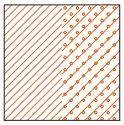

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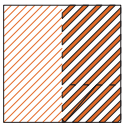
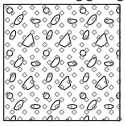


GP/GW

CRA Crushed Aggregate



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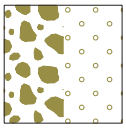
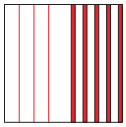
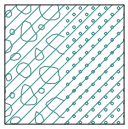


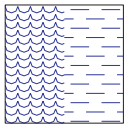
ML/MH



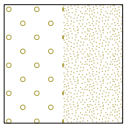
GC/SC



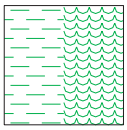
OH/OL



GP/SP

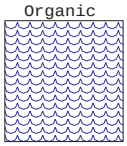


OL/OH

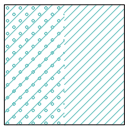


PT Peat

OH Organic



SC/CL



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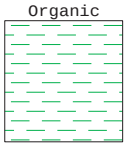
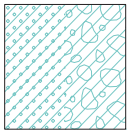
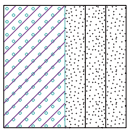


SC/GC

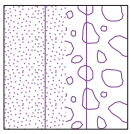


SC-SM

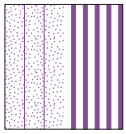


SP/SW

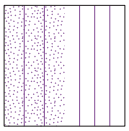
SM/GM



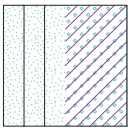
SM/MH



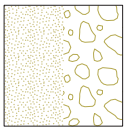
SM/ML



SM/SC



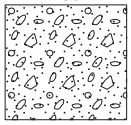
SP/GP



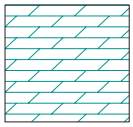
SW/SP

Sedimentary Rocks

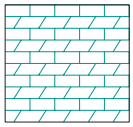
BLD-Boulder Bed



DLS Dolostone

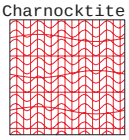


LST-DLS-Interbedded Limestone/Dolostone



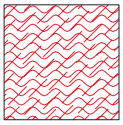
Igneous Rocks

CHT Charnocktite

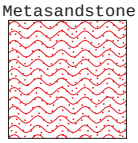


Metamorphic Rocks

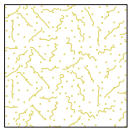
MSLS Metasiltstone



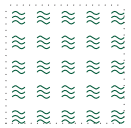
MSST Metasandstone



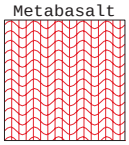
QZT - Quartzite



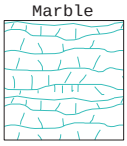
SPS Soapstone



MBST Metabasalt



MBL Marble



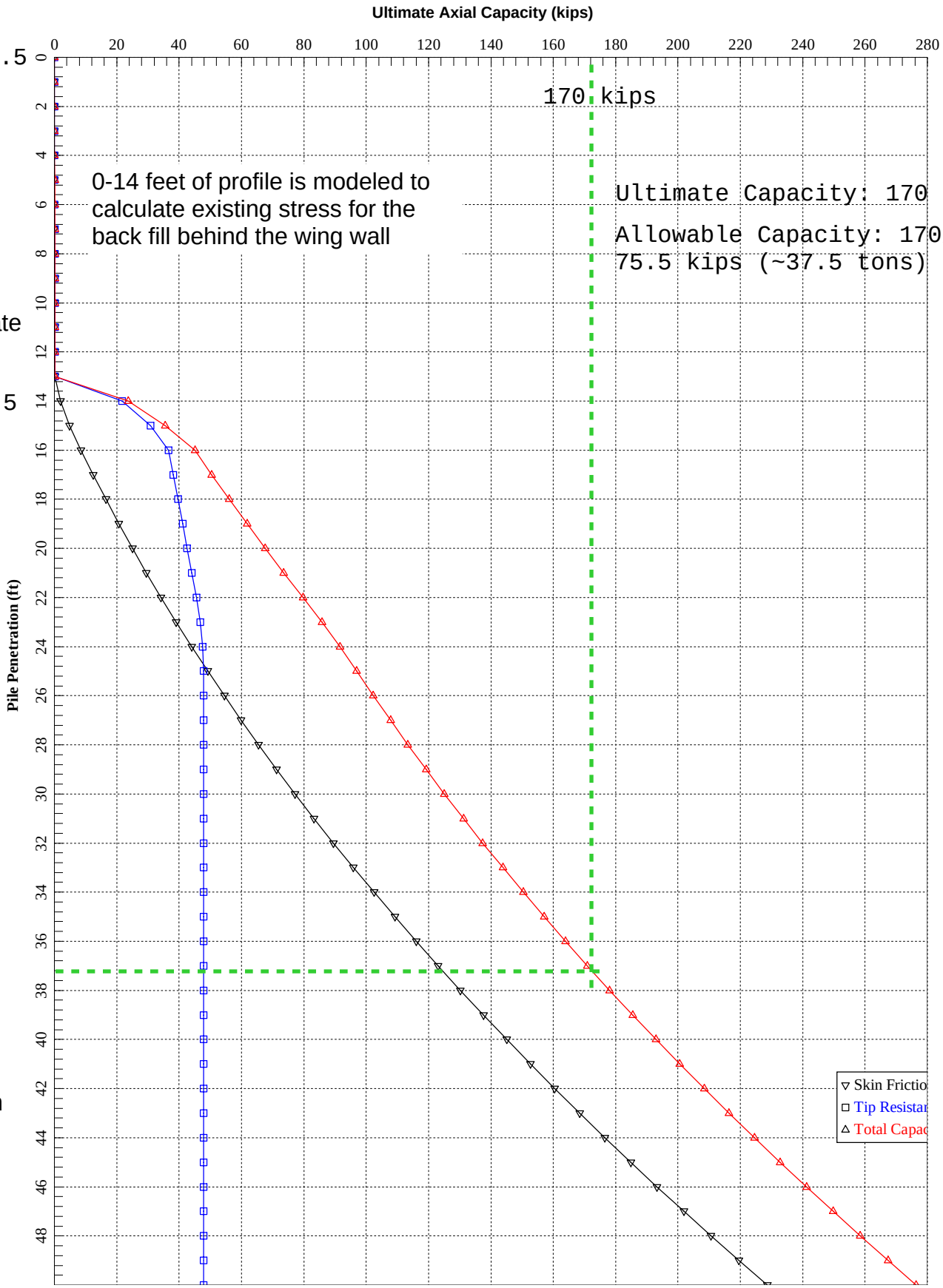
Sampling

Table 1: Summary of Soil Design Parameters

Stratum (Material Description)	Unit Weight, γ (pcf)	Short-Term Strength		Long-Term Strength		Lateral Earth Pressure (LEP) Coefficients [2,3,4,6]						Coefficient of Sliding (μ) [7,8]
						Active		At-Rest		Passive[5]		
		Friction Angle, ϕ (degrees)	Cohesion, c (psf)	Friction Angle, ϕ' (degrees)	Cohesion, c' (psf)	Level Backslope	2H:1V Backslope	Level Backslope	2H:1V Backslope	Level Toeslope	2H:1V Toeslope	
New Fill[1]	120	30	50	30	50	0.33	0.54	0.50	0.72	3.0	1.5	0.55
Select Type I Material, CBR 30	135	34	0	0	34	0.28	0.41	0.44	0.64	3.5	1.9	0.65
Existing Fill	115	28	50	28	50	0.36	0.65	0.53	0.77	2.8	1.3	0.50
Alluvium -Fine	115	0	500[9]	28	0	0.36	0.65	0.53	0.77	2.8	1.3	0.50
Alluvium -Coarse (Top)	115	30	50	30	50	0.33	0.54	0.50	0.72	3.0	1.5	0.55
Alluvium -Coarse (Bottom)[10]	115	28	0	28	0	0.36	0.65	0.53	0.77	2.8	1.3	0.50
Potomac Formation	125	34	0	34	0	0.28	0.41	0.44	0.64	3.5	1.9	0.65

1. New Fill: Uniform, horizontal backfill, compacted to at least 95% of the VTM-1 maximum dry density, rendering a maximum unit weight of 120 pcf.
2. Lateral earth pressure coefficients are based on Rankine's equation.
3. For active earth pressure, wall must rotate about base, with top lateral movements 0.002 H to 0.004 H, where H is wall height. For passive earth pressure, wall must move horizontally to mobilize resistance.
4. Include traffic, pedestrian, or heavy compaction equipment surcharge pressure when calculating the earth pressures where appropriate.
5. No safety factor is included in these values.
6. Relatively granular or free draining backfill material shall be used behind the walls.
7. $\delta_{slide} = \phi'$ for concrete cast against soil
8. A factor of 0.80 should be applied to the sliding resistance (μ) for precast concrete footing per section 10.6.3.4 of AASHTO LRFD 2020.
9. *Cohesion value provided was used for short-term analysis.
10. Alluvium -Coarse (Bottom) was observed within the North Abutment only.

Abutment A, Geotechnical Axial Capacity for HP 10x42



~EL 42.5

0-14 feet of profile is modeled to calculate existing stress for the back fill behind the wing wall

Ultimate Capacity: 170 kips

Allowable Capacity: 170/2.25 = 75.5 kips (~37.5 tons)

Approximate bottom of abutment

~EL 28.5

~EL 5

Bottom of existing piles. 23.5 feet below the bottom of the wall

==========

APILE for Windows, Version 2019.9.3

Serial Number : 506768014

A Program for Analyzing the Axial Capacity
and Short-term Settlement of Driven Piles
under Axial Loading.

==========

This program is licensed to :

Terracon, Inc.
Global License, Global License

Path to file locations : C:\Users\bdmathson\OneDrive - Terracon Consultants Inc\Desktop\66\JD205151\Working Files\Calculations-Analyses\
Name of input data file : South Abutment.ap9d
Name of output file : South Abutment.ap9o
Name of plot output file : South Abutment.ap9p

Time and Date of Analysis

Date: February 08, 2021 Time: 15:17:45

1

****
* INPUT INFORMATION *
****

Shirlington Pedestrian Bridge - North Abutment - HP ()

DESIGNER : GeoConcepts

JOB NUMBER : JD205151

METHOD FOR UNIT LOAD TRANSFERS :

- FHWA (Federal Highway Administration)
  Unfactored Unit Side Friction and Unit Side Resistance are used.

COMPUTATION METHOD(S) FOR PILE CAPACITY :

- FHWA (Federal Highway Administration)

TYPE OF LOADING :
- COMPRESSION

PILE TYPE :

H-Pile/Steel Pile

DATA FOR AXIAL STIFFNESS :

- MODULUS OF ELASTICITY = 0.290E+08 PSI
- CROSS SECTION AREA = 93.77 IN2

NONCIRCULAR PILE PROPERTIES :

- TOTAL PILE LENGTH, TL = 50.00 FT.
- BATTER ANGLE = 0.00 DEG
- PILE STICKUP LENGTH, PSL = 0.00 FT.
- ZERO FRICTION LENGTH, ZFL = 0.00 FT.
- PERIMETER OF PILE = 38.74 IN.
- TIP AREA OF PILE = 93.77 IN2
- INCREMENT OF PILE LENGTH
  USED IN COMPUTATION = 1.00 FT.

SOIL INFORMATIONS :

DEPTH FT.	SOIL TYPE	LATERAL EARTH PRESSURE	EFFECTIVE UNIT WEIGHT LB/FT^3	FRICTION ANGLE DEGREES	BEARING CAPACITY FACTOR
0.00	SAND	0.80*	100.00	28.00	16.80**
14.00	SAND	0.80*	100.00	28.00	16.80**
14.00	SAND	0.80*	62.60	34.00	36.00**
60.00	SAND	0.80*	62.60	34.00	36.00**

* VALUE ASSUMED BY THE PROGRAM
** VALUE ESTIMATED BY THE PROGRAM BASED ON FRICTION ANGLE

MAXIMUM UNIT FRICTION KSF	MAXIMUM UNIT BEARING KSF	UNDISTURB SHEAR STRENGTH KSF	REMOLDED SHEAR STRENGTH KSF	BLOW COUNT	UNIT SKIN FRICTION KSF	UNIT END BEARING KSF
0.10E+08*	0.10E+08*	0.00	0.00	0.00	0.00	0.00
0.10E+08*	0.10E+08*	0.00	0.00	0.00	0.00	0.00
0.10E+08*	0.10E+08*	0.00	0.00	0.00	0.00	0.00
0.10E+08*	0.10E+08*	0.00	0.00	0.00	0.00	0.00

* MAXIMUM UNIT FRICTION AND/OR MAXIMUM UNIT BEARING
WERE SET TO BE 0.10E+08 BECAUSE THE USER DOES NOT
PLAN TO LIMIT THE COMPUTED DATA.

DEPTH FT.	LRFD FACTOR ON UNIT FRICTION	LRFD FACTOR ON UNIT BEARING
0.00	0.010	0.010
14.00	0.010	0.010
14.00	1.000	1.000
60.00	1.000	1.000

1

****
* COMPUTATION RESULT *
****

****
* FED. HWY. METHOD *
****

PILE PENETRATION FT.	TOTAL SKIN FRICTION KIP	END BEARING KIP	ULTIMATE CAPACITY KIP
0.00	0.0	0.0	0.0
1.00	0.0	0.0	0.0
2.00	0.0	0.0	0.0
3.00	0.0	0.0	0.0
4.00	0.0	0.0	0.0
5.00	0.0	0.0	0.1
6.00	0.0	0.0	0.1

7.00	0.0	0.1	0.1
8.00	0.0	0.1	0.1
9.00	0.1	0.1	0.1
10.00	0.1	0.1	0.1
11.00	0.1	0.1	0.2
12.00	0.1	0.1	0.2
13.00	0.1	0.1	0.2
14.00	2.0	21.7	23.7
15.00	4.8	30.8	35.6
16.00	8.5	36.6	45.1
17.00	12.4	38.1	50.5
18.00	16.5	39.6	56.1
19.00	20.7	41.1	61.8
20.00	25.0	42.6	67.6
21.00	29.5	44.1	73.6
22.00	34.2	45.6	79.8
23.00	39.0	46.8	85.8
24.00	44.0	47.5	91.6
25.00	49.2	47.8	97.0
26.00	54.5	47.9	102.3
27.00	59.9	47.9	107.8
28.00	65.5	47.9	113.4
29.00	71.3	47.9	119.2
30.00	77.2	47.9	125.1
31.00	83.3	47.9	131.2
32.00	89.5	47.9	137.4
33.00	95.9	47.9	143.8
34.00	102.5	47.9	150.4
35.00	109.2	47.9	157.1
36.00	116.0	47.9	163.9
37.00	123.1	47.9	170.9
38.00	130.2	47.9	178.1
39.00	137.6	47.9	185.5
40.00	145.1	47.9	192.9
41.00	152.7	47.9	200.6
42.00	160.5	47.9	208.4
43.00	168.5	47.9	216.3
44.00	176.6	47.9	224.5
45.00	184.9	47.9	232.7
46.00	193.3	47.9	241.2
47.00	201.9	47.9	249.7
48.00	210.6	47.9	258.5
49.00	219.5	47.9	267.4
50.00	228.6	47.9	276.4

NOTES:
- AN ASTERISK IS PLACED IN THE END-BEARING COLUMN
IF THE TIP RESISTANCE IS CONTROLLED BY THE FRICTION
OF SOIL PLUG INSIDE AN OPEN-ENDED PIPE PILE.

****
* COMPUTE LOAD-DISTRIBUTION AND LOAD-SETTLEMENT *
* CURVES FOR AXIAL LOADING *
****

T-Z CURVE NO.	NO. OF POINTS	DEPTH TO CURVE FT.	LOAD TRANSFER PSI	PILE MOVEMENT IN.
1	10	0.0000E+00		
			0.0000E+00	0.0000E+00
			0.0000E+00	0.1973E-01
			0.0000E+00	0.3823E-01
			0.0000E+00	0.7029E-01
			0.0000E+00	0.9865E-01
			0.0000E+00	0.1233E+00
			0.0000E+00	0.2466E+00
			0.0000E+00	0.3699E+00
			0.0000E+00	0.6166E+00
			0.0000E+00	0.2466E+01
2	10	0.7025E+01		
			0.0000E+00	0.0000E+00
			0.6285E+00	0.1973E-01
			0.1047E+01	0.3823E-01
			0.1571E+01	0.7029E-01
			0.1885E+01	0.9865E-01
			0.2095E+01	0.1233E+00
			0.2095E+01	0.2466E+00
			0.2095E+01	0.3699E+00
			0.2095E+01	0.6166E+00
			0.2095E+01	0.2466E+01
3	10	0.1396E+02		
			0.0000E+00	0.0000E+00
			0.1249E+01	0.1973E-01
			0.2081E+01	0.3823E-01
			0.3122E+01	0.7029E-01
			0.3746E+01	0.9865E-01
			0.4162E+01	0.1233E+00
			0.4162E+01	0.2466E+00
			0.4162E+01	0.3699E+00
			0.4162E+01	0.6166E+00
			0.4162E+01	0.2466E+01
4	10	0.1400E+02		
			0.0000E+00	0.0000E+00
			0.1252E+01	0.1973E-01
			0.2087E+01	0.3823E-01
			0.3131E+01	0.7029E-01
			0.3757E+01	0.9865E-01
			0.4175E+01	0.1233E+00
			0.4175E+01	0.2466E+00
			0.4175E+01	0.3699E+00

			0.4175E+01	0.6166E+00
			0.4175E+01	0.2466E+01
5	10	0.3703E+02		
			0.0000E+00	0.0000E+00
			0.4583E+01	0.1973E-01
			0.7638E+01	0.3823E-01
			0.1146E+02	0.7029E-01
			0.1375E+02	0.9865E-01
			0.1528E+02	0.1233E+00
			0.1528E+02	0.2466E+00
			0.1528E+02	0.3699E+00
			0.1528E+02	0.6166E+00
			0.1528E+02	0.2466E+01
6	10	0.5996E+02		
			0.0000E+00	0.0000E+00
			0.5893E+01	0.1973E-01
			0.9821E+01	0.3823E-01
			0.1473E+02	0.7029E-01
			0.1768E+02	0.9865E-01
			0.1964E+02	0.1233E+00
			0.1964E+02	0.2466E+00
			0.1964E+02	0.3699E+00
			0.1964E+02	0.6166E+00
			0.1964E+02	0.2466E+01

TIP LOAD KIP	TIP MOVEMENT IN.
0.0000E+00	0.0000E+00
0.2992E+01	0.6166E-02
0.5984E+01	0.1233E-01
0.1197E+02	0.2466E-01
0.2394E+02	0.1603E+00
0.3591E+02	0.5179E+00
0.4309E+02	0.9002E+00
0.4787E+02	0.1233E+01
0.4787E+02	0.1850E+01
0.4787E+02	0.2466E+01

LOAD VERSUS SETTLEMENT CURVE
****

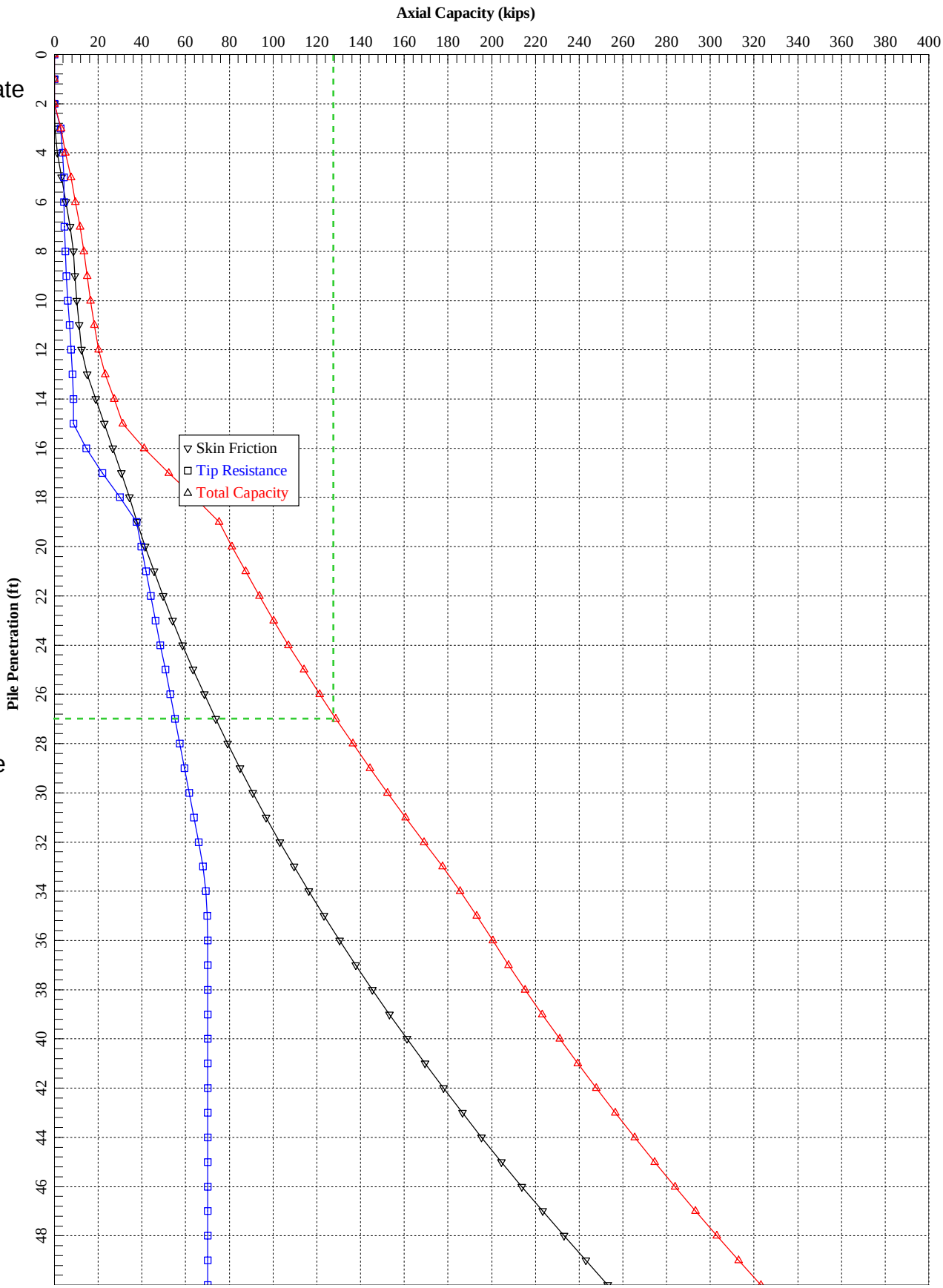
TOP LOAD KIP	TOP MOVEMENT IN.	TIP LOAD KIP	TIP MOVEMENT IN.
0.4646E+00	0.1694E-03	0.4853E-01	0.1000E-03
0.4646E+01	0.1694E-02	0.4853E+00	0.1000E-02

South Abutment.ap9o

0.2323E+02	0.8468E-02	0.2426E+01	0.5000E-02
0.4646E+02	0.1694E-01	0.4853E+01	0.1000E-01
0.8979E+02	0.3355E-01	0.9706E+01	0.2000E-01
0.1660E+03	0.7496E-01	0.1420E+02	0.5000E-01
0.2178E+03	0.1128E+00	0.1685E+02	0.8000E-01
0.2432E+03	0.1368E+00	0.1862E+02	0.1000E+00
0.2653E+03	0.2409E+00	0.2527E+02	0.2000E+00
0.2754E+03	0.5431E+00	0.3531E+02	0.5000E+00
0.2813E+03	0.8444E+00	0.4121E+02	0.8000E+00
0.2846E+03	0.1045E+01	0.4452E+02	0.1000E+01
0.2880E+03	0.2046E+01	0.4787E+02	0.2000E+01

~EL 39

Approximate bottom of abutment



~EL 12

Approximate Pile Tip Elevation

==========

APILE for Windows, Version 2019.9.3

Serial Number : 506768014

A Program for Analyzing the Axial Capacity
and Short-term Settlement of Driven Piles
under Axial Loading.

==========

This program is licensed to :

Terracon, Inc.
Global License, Global License

Path to file locations : N:\Projects\2020\JD205151\Working Files\Calculations-Analyses\Pile Axial\
Name of input data file : North Abutment - Rev1.ap9d
Name of output file : North Abutment - Rev1.ap9o
Name of plot output file : North Abutment - Rev1.ap9p

Time and Date of Analysis

Date: February 11, 2021 Time: 16:13:30

1

****
* INPUT INFORMATION *
****

Shirlington Pedestrian Bridge - North Abutment

DESIGNER : GeoConcepts

JOB NUMBER : JD205151

METHOD FOR UNIT LOAD TRANSFERS :

- FHWA (Federal Highway Administration)
  Unfactored Unit Side Friction and Unit Side Resistance are used.

COMPUTATION METHOD(S) FOR PILE CAPACITY :

- FHWA (Federal Highway Administration)

TYPE OF LOADING :
- COMPRESSION

PILE TYPE :

H-Pile/Steel Pile

DATA FOR AXIAL STIFFNESS :

- MODULUS OF ELASTICITY = 0.290E+08 PSI
- CROSS SECTION AREA = 137.11 IN2

NONCIRCULAR PILE PROPERTIES :

- TOTAL PILE LENGTH, TL = 50.00 FT.
- BATTER ANGLE = 0.00 DEG
- PILE STICKUP LENGTH, PSL = 0.00 FT.
- ZERO FRICTION LENGTH, ZFL = 0.00 FT.
- PERIMETER OF PILE = 46.84 IN.
- TIP AREA OF PILE = 137.11 IN2
- INCREMENT OF PILE LENGTH
  USED IN COMPUTATION = 1.00 FT.

SOIL INFORMATIONS :

DEPTH FT.	SOIL TYPE	LATERAL EARTH PRESSURE	EFFECTIVE UNIT WEIGHT LB/FT^3	FRICTION ANGLE DEGREES	BEARING CAPACITY FACTOR
0.00	SAND	0.80*	52.60	28.00	16.80**
3.00	SAND	0.80*	52.60	28.00	16.80**
3.00	CLAY	0.80*	52.60	0.00	8.00**
7.00	CLAY	0.80*	52.60	0.00	8.00**
7.00	SAND	0.80*	52.60	28.00	16.80**

12.00	SAND	0.80*	52.60	28.00	16.80**
12.00	CLAY	0.80*	62.60	0.00	8.00**
17.00	CLAY	0.80*	62.60	0.00	8.00**
17.00	SAND	0.80*	62.60	34.00	36.00**
60.00	SAND	0.80*	62.60	34.00	36.00**

* VALUE ASSUMED BY THE PROGRAM
** VALUE ESTIMATED BY THE PROGRAM BASED ON FRICTION ANGLE

MAXIMUM UNIT FRICTION KSF	MAXIMUM UNIT BEARING KSF	UNDISTURB SHEAR STRENGTH KSF	REMOLDED SHEAR STRENGTH KSF	BLOW COUNT	UNIT SKIN FRICTION KSF	UNIT END BEARING KSF
0.10E+08*	0.10E+08*	0.00	0.00	0.00	0.00	0.00
0.10E+08*	0.10E+08*	0.00	0.00	0.00	0.00	0.00
0.10E+08*	0.10E+08*	0.50	0.00	0.00	0.00	0.00
0.10E+08*	0.10E+08*	0.50	0.00	0.00	0.00	0.00
0.10E+08*	0.10E+08*	0.00	0.00	0.00	0.00	0.00
0.10E+08*	0.10E+08*	0.00	0.00	0.00	0.00	0.00
0.10E+08*	0.10E+08*	1.00	0.00	0.00	0.00	0.00
0.10E+08*	0.10E+08*	1.00	0.00	0.00	0.00	0.00
0.10E+08*	0.10E+08*	0.00	0.00	0.00	0.00	0.00
0.10E+08*	0.10E+08*	0.00	0.00	0.00	0.00	0.00

* MAXIMUM UNIT FRICTION AND/OR MAXIMUM UNIT BEARING
WERE SET TO BE 0.10E+08 BECAUSE THE USER DOES NOT
PLAN TO LIMIT THE COMPUTED DATA.

DEPTH FT.	LRFD FACTOR ON UNIT FRICTION	LRFD FACTOR ON UNIT BEARING
0.00	0.001	0.001
3.00	0.001	0.001
3.00	1.000	1.000
7.00	1.000	1.000
7.00	1.000	1.000
12.00	1.000	1.000
12.00	1.000	1.000
17.00	1.000	1.000
17.00	1.000	1.000
60.00	1.000	1.000

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****
* COMPUTATION RESULT *

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****
* FED. HWY. METHOD *
****

PILE PENETRATION FT.	TOTAL SKIN FRICTION KIP	END BEARING KIP	ULTIMATE CAPACITY KIP
0.00	0.0	0.0	0.0
1.00	0.0	0.0	0.0
2.00	0.0	0.0	0.0
3.00	0.2	2.8	3.0
4.00	1.4	3.7	5.0
5.00	3.3	4.3	7.6
6.00	5.3	4.3	9.6
7.00	7.2	4.6	11.8
8.00	8.6	5.0	13.5
9.00	9.4	5.5	14.9
10.00	10.3	6.1	16.4
11.00	11.3	7.0	18.3
12.00	12.4	7.7	20.1
13.00	14.9	8.2	23.2
14.00	18.8	8.6	27.4
15.00	22.7	8.6	31.3
16.00	26.6	14.5	41.1
17.00	30.5	21.9	52.4
18.00	34.2	29.9	64.1
19.00	37.7	37.5	75.3
20.00	41.5	39.7	81.2
21.00	45.5	41.9	87.4
22.00	49.6	44.1	93.7
23.00	54.0	46.3	100.3
24.00	58.6	48.5	107.1
25.00	63.4	50.7	114.1
26.00	68.5	52.9	121.4
27.00	73.7	55.1	128.8
28.00	79.2	57.3	136.5
29.00	84.8	59.5	144.3
30.00	90.7	61.7	152.4
31.00	96.8	63.9	160.7
32.00	103.1	66.0	169.1
33.00	109.6	67.9	177.5
34.00	116.4	69.2	185.5
35.00	123.3	69.8	193.1
36.00	130.5	70.0	200.5
37.00	137.8	70.0	207.8
38.00	145.4	70.0	215.4
39.00	153.2	70.0	223.2
40.00	161.2	70.0	231.2

41.00	169.5	70.0	239.5
42.00	177.9	70.0	247.9
43.00	186.6	70.0	256.6
44.00	195.4	70.0	265.4
45.00	204.5	70.0	274.5
46.00	213.8	70.0	283.8
47.00	223.3	70.0	293.3
48.00	233.0	70.0	303.0
49.00	243.0	70.0	313.0
50.00	253.1	70.0	323.1

NOTES:
- AN ASTERISK IS PLACED IN THE END-BEARING COLUMN
  IF THE TIP RESISTANCE IS CONTROLLED BY THE FRICTION
  OF SOIL PLUG INSIDE AN OPEN-ENDED PIPE PILE.

****
* COMPUTE LOAD-DISTRIBUTION AND LOAD-SETTLEMENT *
* CURVES FOR AXIAL LOADING *
****

T-Z CURVE NO.	NO. OF POINTS	DEPTH TO CURVE FT.	LOAD TRANSFER PSI	PILE MOVEMENT IN.
1	10	0.0000E+00		
			0.0000E+00	0.0000E+00
			0.0000E+00	0.2386E-01
			0.0000E+00	0.4622E-01
			0.0000E+00	0.8498E-01
			0.0000E+00	0.1193E+00
			0.0000E+00	0.1491E+00
			0.0000E+00	0.2982E+00
			0.0000E+00	0.4473E+00
			0.0000E+00	0.7455E+00
			0.0000E+00	0.2982E+01
2	10	0.1525E+01		
			0.0000E+00	0.0000E+00
			0.7791E-01	0.2386E-01
			0.1298E+00	0.4622E-01
			0.1948E+00	0.8498E-01
			0.2337E+00	0.1193E+00
			0.2597E+00	0.1491E+00
			0.2597E+00	0.2982E+00
			0.2597E+00	0.4473E+00
			0.2597E+00	0.7455E+00
			0.2597E+00	0.2982E+01
3	10	0.2958E+01		
			0.0000E+00	0.0000E+00

			0.1511E+00	0.2386E-01
			0.2519E+00	0.4622E-01
			0.3778E+00	0.8498E-01
			0.4534E+00	0.1193E+00
			0.5038E+00	0.1491E+00
			0.5038E+00	0.2982E+00
			0.5038E+00	0.4473E+00
			0.5038E+00	0.7455E+00
			0.5038E+00	0.2982E+01
4	10	0.3000E+01		
			0.0000E+00	0.0000E+00
			0.1533E+00	0.2386E-01
			0.2554E+00	0.4622E-01
			0.3831E+00	0.8498E-01
			0.4598E+00	0.1193E+00
			0.5109E+00	0.1491E+00
			0.4598E+00	0.2982E+00
			0.4598E+00	0.4473E+00
			0.4598E+00	0.7455E+00
			0.4598E+00	0.2982E+01
5	10	0.5025E+01		
			0.0000E+00	0.0000E+00
			0.1042E+01	0.2386E-01
			0.1736E+01	0.4622E-01
			0.2604E+01	0.8498E-01
			0.3125E+01	0.1193E+00
			0.3472E+01	0.1491E+00
			0.3125E+01	0.2982E+00
			0.3125E+01	0.4473E+00
			0.3125E+01	0.7455E+00
			0.3125E+01	0.2982E+01
6	10	0.6958E+01		
			0.0000E+00	0.0000E+00
			0.1042E+01	0.2386E-01
			0.1736E+01	0.4622E-01
			0.2604E+01	0.8498E-01
			0.3125E+01	0.1193E+00
			0.3472E+01	0.1491E+00
			0.3125E+01	0.2982E+00
			0.3125E+01	0.4473E+00
			0.3125E+01	0.7455E+00
			0.3125E+01	0.2982E+01
7	10	0.7000E+01		
			0.0000E+00	0.0000E+00
			0.1042E+01	0.2386E-01
			0.1736E+01	0.4622E-01
			0.2604E+01	0.8498E-01
			0.3125E+01	0.1193E+00
			0.3472E+01	0.1491E+00
			0.3472E+01	0.2982E+00
			0.3472E+01	0.4473E+00
			0.3472E+01	0.7455E+00

			0.3472E+01	0.2982E+01
8	10	0.9525E+01		
			0.0000E+00	0.0000E+00
			0.4866E+00	0.2386E-01
			0.8110E+00	0.4622E-01
			0.1216E+01	0.8498E-01
			0.1460E+01	0.1193E+00
			0.1622E+01	0.1491E+00
			0.1622E+01	0.2982E+00
			0.1622E+01	0.4473E+00
			0.1622E+01	0.7455E+00
			0.1622E+01	0.2982E+01
9	10	0.1196E+02		
			0.0000E+00	0.0000E+00
			0.6109E+00	0.2386E-01
			0.1018E+01	0.4622E-01
			0.1527E+01	0.8498E-01
			0.1833E+01	0.1193E+00
			0.2036E+01	0.1491E+00
			0.2036E+01	0.2982E+00
			0.2036E+01	0.4473E+00
			0.2036E+01	0.7455E+00
			0.2036E+01	0.2982E+01
10	10	0.1200E+02		
			0.0000E+00	0.0000E+00
			0.6130E+00	0.2386E-01
			0.1022E+01	0.4622E-01
			0.1533E+01	0.8498E-01
			0.1839E+01	0.1193E+00
			0.2043E+01	0.1491E+00
			0.1839E+01	0.2982E+00
			0.1839E+01	0.4473E+00
			0.1839E+01	0.7455E+00
			0.1839E+01	0.2982E+01
11	10	0.1453E+02		
			0.0000E+00	0.0000E+00
			0.2083E+01	0.2386E-01
			0.3472E+01	0.4622E-01
			0.5208E+01	0.8498E-01
			0.6250E+01	0.1193E+00
			0.6944E+01	0.1491E+00
			0.6250E+01	0.2982E+00
			0.6250E+01	0.4473E+00
			0.6250E+01	0.7455E+00
			0.6250E+01	0.2982E+01
12	10	0.1696E+02		
			0.0000E+00	0.0000E+00
			0.2083E+01	0.2386E-01
			0.3472E+01	0.4622E-01
			0.5208E+01	0.8498E-01
			0.6250E+01	0.1193E+00
			0.6944E+01	0.1491E+00

			0.6250E+01	0.2982E+00
			0.6250E+01	0.4473E+00
			0.6250E+01	0.7455E+00
			0.6250E+01	0.2982E+01
13	10	0.1700E+02		
			0.0000E+00	0.0000E+00
			0.2083E+01	0.2386E-01
			0.3472E+01	0.4622E-01
			0.5208E+01	0.8498E-01
			0.6250E+01	0.1193E+00
			0.6944E+01	0.1491E+00
			0.6944E+01	0.2982E+00
			0.6944E+01	0.4473E+00
			0.6944E+01	0.7455E+00
			0.6944E+01	0.2982E+01
14	10	0.3853E+02		
			0.0000E+00	0.0000E+00
			0.4166E+01	0.2386E-01
			0.6943E+01	0.4622E-01
			0.1041E+02	0.8498E-01
			0.1250E+02	0.1193E+00
			0.1389E+02	0.1491E+00
			0.1389E+02	0.2982E+00
			0.1389E+02	0.4473E+00
			0.1389E+02	0.7455E+00
			0.1389E+02	0.2982E+01
15	10	0.5996E+02		
			0.0000E+00	0.0000E+00
			0.5472E+01	0.2386E-01
			0.9120E+01	0.4622E-01
			0.1368E+02	0.8498E-01
			0.1642E+02	0.1193E+00
			0.1824E+02	0.1491E+00
			0.1824E+02	0.2982E+00
			0.1824E+02	0.4473E+00
			0.1824E+02	0.7455E+00
			0.1824E+02	0.2982E+01

TIP LOAD KIP	TIP MOVEMENT IN.
0.0000E+00	0.0000E+00
0.4375E+01	0.7455E-02
0.8750E+01	0.1491E-01
0.1750E+02	0.2982E-01
0.3500E+02	0.1938E+00
0.5250E+02	0.6262E+00
0.6300E+02	0.1088E+01
0.7000E+02	0.1491E+01
0.7000E+02	0.2236E+01

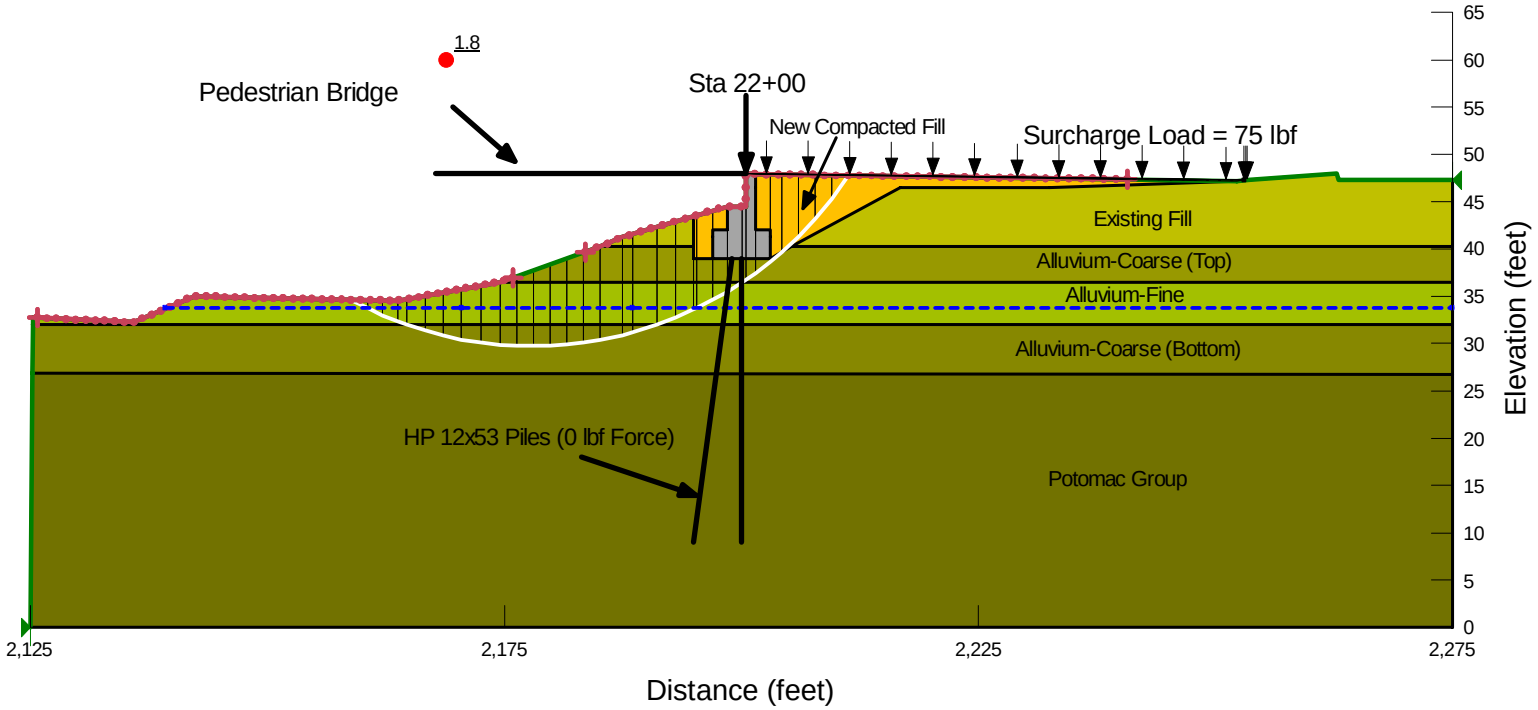
0.7000E+02 0.2982E+01

LOAD VERSUS SETTLEMENT CURVE
****

TOP LOAD KIP	TOP MOVEMENT IN.	TIP LOAD KIP	TIP MOVEMENT IN.
0.4067E+00	0.1428E-03	0.5869E-01	0.1000E-03
0.4067E+01	0.1428E-02	0.5869E+00	0.1000E-02
0.2033E+02	0.7140E-02	0.2934E+01	0.5000E-02
0.4067E+02	0.1428E-01	0.5869E+01	0.1000E-01
0.8116E+02	0.2856E-01	0.1174E+02	0.2000E-01
0.1585E+03	0.6671E-01	0.1965E+02	0.5000E-01
0.2115E+03	0.1022E+00	0.2286E+02	0.8000E-01
0.2375E+03	0.1249E+00	0.2499E+02	0.1000E+00
0.2871E+03	0.2307E+00	0.3525E+02	0.2000E+00
0.2978E+03	0.5325E+00	0.4739E+02	0.5000E+00
0.3069E+03	0.8339E+00	0.5645E+02	0.8000E+00
0.3114E+03	0.1035E+01	0.6099E+02	0.1000E+01
0.3205E+03	0.2036E+01	0.7000E+02	0.2000E+01

Project: Shirlington Pedestrian Bridge
Project Number: JD205151
Title: Shirlington Pedestrian Bridge
Name: Circular, Drained (Long-Term)

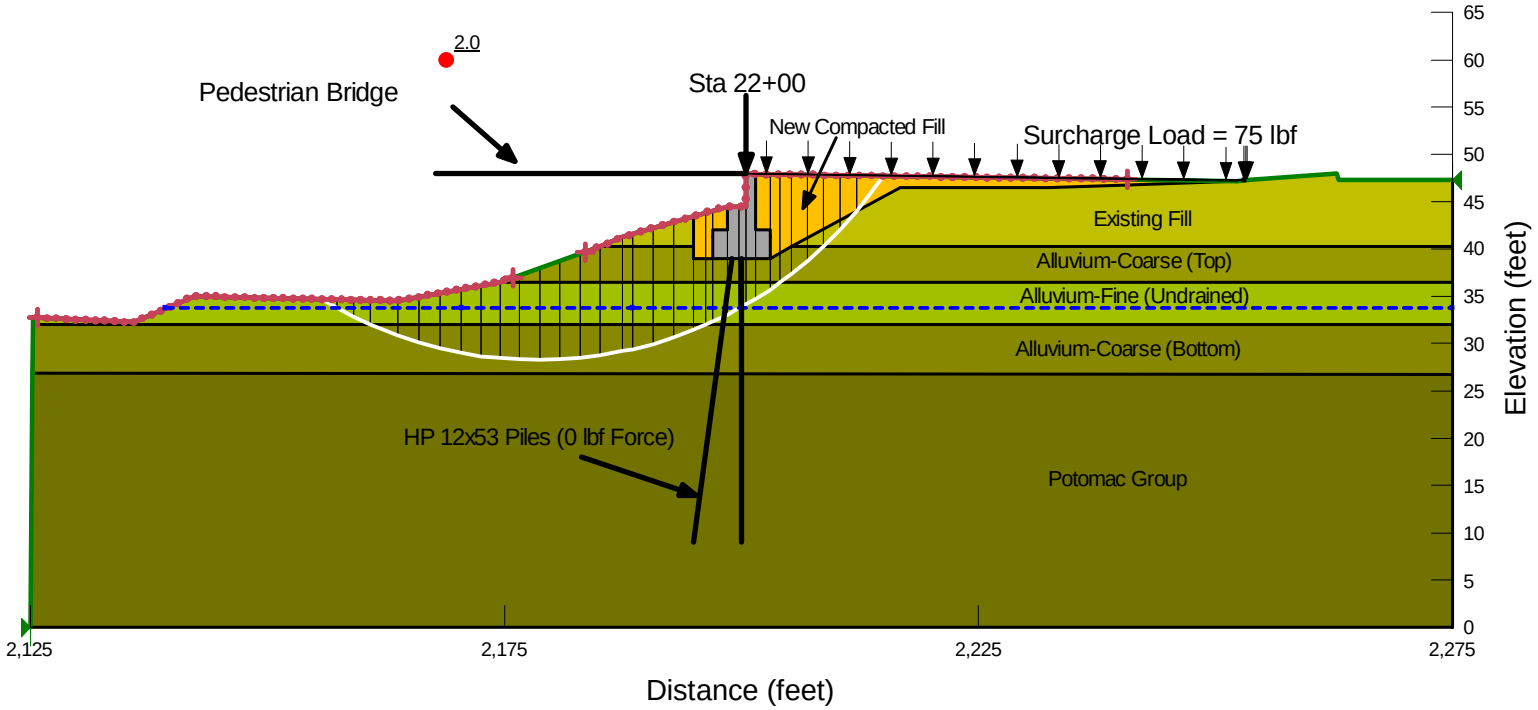
Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Alluvium-Coarse (Bottom)	Mohr-Coulomb	115	0	28
	Alluvium-Coarse (Top)	Mohr-Coulomb	115	50	30
	Alluvium-Fine	Mohr-Coulomb	115	0	28
	Concrete	High Strength	150		
	Existing Fill	Mohr-Coulomb	115	50	28
	New Compacted Fill	Mohr-Coulomb	120	50	30
	Potomac Formation	Mohr-Coulomb	125	0	34



Note: Data point is randomly placed to show factor of safety value only and does not represent the true center of the critical slip surface. Actual coordinates of the center of critical slip surface are: (2,177.9186, 69.641822) ft

Project: Shirlington Pedestrian Bridge
Project Number: JD205151
Title: Shirlington Pedestrian Bridge
Name: Circular, Undrained (Short-Term)

Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Alluvium-Coarse (Bottom)	Mohr-Coulomb	115	0	28
	Alluvium-Coarse (Top)	Mohr-Coulomb	115	50	30
	Alluvium-Fine (Undrained)	Mohr-Coulomb	115	500	0
	Concrete	High Strength	150		
	Existing Fill	Mohr-Coulomb	115	50	28
	New Compacted Fill	Mohr-Coulomb	120	50	30
	Potomac Formation	Mohr-Coulomb	125	0	34



Note: Data point is randomly placed to show factor of safety value only and does not represent the true center of the critical slip surface. Actual coordinates of the center of critical slip surface are: (2,178.578, 72.031676) ft

Circular, Drained (Long-Term)

File Information

File Version: 10.02
Title: Shirlington Pedestrian Bridge
Created By: Mathson, Braque D
Last Edited By: Mathson, Braque D
Revision Number: 76
Date: 02/08/2021
Time: 06:31:42 PM
Tool Version: 10.2.2.20559
File Name: Existing Slope.gsz
Directory: C:\Users\bdmathson\OneDrive - Terracon Consultants Inc\Desktop\66\JD205151\Working Files\Calculations-Analyses\
Last Solved Date: 02/08/2021
Last Solved Time: 10:43:37 PM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

Circular, Drained (Long-Term)

Kind: SLOPE/W
Method: Spencer
Settings
- PWP Conditions from: Piezometric Line
  - Apply Phreatic Correction: No
  - Use Staged Rapid Drawdown: No
- Unit Weight of Water: 62.430189 pcf

Slip Surface
- Direction of movement: Right to Left
- Use Passive Mode: No
- Slip Surface Option: Entry and Exit
- Critical slip surfaces saved: 1
- Optimize Critical Slip Surface Location: No
- Tension Crack Option: (none)

Distribution
- F of S Calculation Option: Constant

Advanced
- Geometry Settings
  - Minimum Slip Surface Depth: 0.1 ft
  - Number of Slices: 30
- Factor of Safety Convergence Settings
  - Maximum Number of Iterations: 100
  - Tolerable difference in F of S: 0.001
- Solution Settings
  - Search Method: Root Finder

Tolerable difference between starting and converged F of S: 3
Maximum iterations to calculate converged lambda: 20
Max Absolute Lambda: 2

Materials

Existing Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 50 psf
Phi': 28 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

Alluvium-Fine

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 0 psf
Phi': 28 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

Potomac Group

Model: Mohr-Coulomb
Unit Weight: 125 pcf
Cohesion': 0 psf
Phi': 34 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

New Compacted Fill

Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion': 50 psf
Phi': 30 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

Concrete

Model: High Strength
Unit Weight: 150 pcf
Pore Water Pressure
- Piezometric Line: 1

Alluvium-Coarse (Top)

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 50 psf
Phi': 30 °

Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Alluvium-Coarse (Bottom)

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 0 psf
Phi': 28 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Slip Surface Entry and Exit

Left Type: Range
Left-Zone Left Coordinate: (2,125.75, 32.726744) ft
Left-Zone Right Coordinate: (2,175.9325, 37.000013) ft
Left-Zone Increment: 50
Right Type: Range
Right-Zone Left Coordinate: (2,183.582, 39.714545) ft
Right-Zone Right Coordinate: (2,240.7332, 47.356179) ft
Right-Zone Increment: 50
Radius Increments: 4

Slip Surface Limits

Left Coordinate: (2,125, 0) ft
Right Coordinate: (2,275, 47.25) ft

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	2,139.25 ft	33.75 ft
Coordinate 2	2,170.5 ft	33.75 ft
Coordinate 3	2,188.5 ft	33.75 ft
Coordinate 4	2,275 ft	33.75 ft

Surcharge Loads

Surcharge Load 1

Surcharge (Unit Weight): 75 pcf
Direction: Vertical

Coordinates

	X	Y

	2,200.5 ft	48.000222 ft
	2,253 ft	47.232143 ft

Geometry

Name: Existing Slope (2)

Settings

View: 2D
Element Thickness: 1 ft

Points

	X	Y
Point 1		
Point 2	2,125.25 ft	32.75 ft
Point 3	2,136 ft	32.25 ft
Point 4	2,142.25 ft	35 ft
Point 5	2,163.75 ft	34.5 ft
Point 6	2,174.5194 ft	36.498555 ft
Point 7	2,232.5 ft	46.5 ft
Point 8	2,253.5 ft	47.25 ft
Point 9	2,262.75 ft	48 ft
Point 10	2,263 ft	47.25 ft
Point 11	2,275 ft	47.25 ft
Point 12	2,275 ft	0 ft
Point 13	2,275 ft	36.5 ft
Point 14	2,275 ft	26.75 ft
Point 15	2,200.5 ft	48.000222 ft
Point 16	2,252.25 ft	47.205357 ft
Point 17	2,240.75 ft	46.794643 ft
Point 18	2,197 ft	41.25 ft
Point 19	2,203 ft	41.25 ft
Point 20	2,203 ft	42 ft
Point 21	2,201.5 ft	42 ft
Point 22	2,201.5 ft	47.869972 ft
Point 23	2,200.5 ft	46.5 ft
Point 24	2,198.5 ft	42 ft
Point 25	2,197 ft	42 ft
Point 26	2,201.5 ft	46.5 ft
Point 27	2,200.5 ft	44.5 ft
Point 28	2,216.75 ft	46.486842 ft
Point 29	2,187.4545 ft	41.249984 ft
Point 30	2,125 ft	0 ft
Point 31	2,125.207 ft	26.928325 ft
Point 32	2,275 ft	40.25 ft
Point 33	2,185.0909 ft	40.249999 ft
Point 34	2,275 ft	32 ft

Point 35	2,125.2464 ft	32 ft
Point 36	2,203 ft	39 ft
Point 37	2,203 ft	40.249999 ft
Point 38	2,197 ft	39 ft
Point 39	2,197.0011 ft	40.249999 ft
Point 40	2,198.5 ft	44.5 ft
Point 41	2,195 ft	39 ft
Point 42	2,195 ft	43.470164 ft
Point 43	2,195 ft	40.249999 ft
Point 44	2,195 ft	41.249997 ft
Point 45	2,205.2957 ft	40.249999 ft
Point 46	2,192 ft	40.75 ft

Regions

	Material	Points	Area
Region 1	Alluvium-Coarse (Top)	6,13,32,45,36,38,41,43,33	345.61 ft²
Region 2	Potomac Group	12,30,31,14	4,023.1 ft²
Region 3	New Compacted Fill	28,7,17,16,22,26,21,20,19,37,36,45	104.2 ft²
Region 4	Concrete	19,20,21,26,22,15,23,27,40,24,25,18,39,38,36,37	28.934 ft²
Region 5	New Compacted Fill	18,25,24,40,42,44,43,41,38,39	12.949 ft²
Region 6	Alluvium-Fine	3,4,5,6,13,34,35,2	564.43 ft²
Region 7	Existing Fill	11,10,9,8,16,17,7,28,45,32	427.24 ft²
Region 8	Alluvium-Coarse (Bottom)	14,31,35,34	772.96 ft²
Region 9	Existing Fill	33,43,44,42,29	17.103 ft²

Slip Results

Slip Surfaces Analysed: 7649 of 13005 converged

Current Slip Surface

Slip Surface: 8,548
Factor of Safety: 1.831
Volume: 362.86775 ft³
Weight: 43,058.884 lbf
Resisting Moment: 839,684.84 lbf·ft
Activating Moment: 458,613.93 lbf·ft
Resisting Force: 18,860.466 lbf
Activating Force: 10,300.564 lbf

Slip Rank: 1 of 13,005 slip surfaces
Exit: (2,158.8478, 34.614005) ft
Entry: (2,211.251, 47.742274) ft
Radius: 39.882868 ft
Center: (2,177.9186, 69.641822) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	2,159.688 ft	34.182003 ft	-26.970012 psf	72.160176 psf	38.368246 psf	0 psf	0 psf	Alluvium-Fine
Slice 2	2,161.3337 ft	33.381615 ft	22.998351 psf	189.72928 psf	88.652406 psf	0 psf	0 psf	Alluvium-Fine
Slice 3	2,162.9446 ft	32.686878 ft	66.370922 psf	277.20989 psf	112.10507 psf	0 psf	0 psf	Alluvium-Fine
Slice 4	2,164.2438 ft	32.180263 ft	97.998986 psf	353.19404 psf	135.68962 psf	0 psf	0 psf	Alluvium-Fine
Slice 5	2,165.698 ft	31.690747 ft	128.55955 psf	452.63769 psf	172.3154 psf	0 psf	0 psf	Alluvium-Coarse (Bottom)
Slice 6	2,167.6188 ft	31.124679 ft	163.89928 psf	566.56833 psf	214.10293 psf	0 psf	0 psf	Alluvium-Coarse (Bottom)
Slice 7	2,169.5396 ft	30.661425 ft	192.82032 psf	661.12522 psf	249.00213 psf	0 psf	0 psf	Alluvium-Coarse (Bottom)
Slice 8	2,171.5048 ft	30.291207 ft	215.93312 psf	739.9264 psf	278.61217 psf	0 psf	0 psf	Alluvium-Coarse (Bottom)
Slice 9	2,173.5145 ft	30.015749 ft	233.12999 psf	803.85726 psf	303.46107 psf	0 psf	0 psf	Alluvium-Coarse (Bottom)
Slice 10	2,175.4004 ft	29.848322 ft	243.58247 psf	869.15421 psf	332.62239 psf	0 psf	0 psf	Alluvium-Coarse (Bottom)
Slice 11	2,177.1623 ft	29.775861 ft	248.10623 psf	937.17079 psf	366.38213 psf	0 psf	0 psf	Alluvium-Coarse (Bottom)
Slice 12	2,178.9242 ft	29.781374 ft	247.76204 psf	992.79234 psf	396.13964 psf	0 psf	0 psf	Alluvium-Coarse (Bottom)
Slice 13	2,180.6861 ft	29.864894 ft	242.54789 psf	1,036.6051 psf	422.20769 psf	0 psf	0 psf	Alluvium-Coarse (Bottom)
Slice 14	2,182.448 ft	30.026915 ft	232.43291 psf	1,069.0603 psf	444.84268 psf	0 psf	0 psf	Alluvium-Coarse (Bottom)
Slice 15	2,184.2099 ft	30.268407 ft	217.35648 psf	1,090.4938 psf	464.25535 psf	0 psf	0 psf	Alluvium-Coarse (Bottom)
Slice 16	2,186.2727 ft	30.66246 ft	192.75574 psf	1,109.8339 psf	487.6191 psf	0 psf	0 psf	

								Alluvium-Coarse (Bottom)
Slice 17	2,187.9772 ft	31.052004 ft	168.43642 psf	1,115.0184 psf	503.30658 psf	0 psf	0 psf	Alluvium-Coarse (Bottom)
Slice 18	2,189.7997 ft	31.594131 ft	134.59131 psf	1,088.1823 psf	507.0333 psf	0 psf	0 psf	Alluvium-Coarse (Bottom)
Slice 19	2,192.0746 ft	32.370364 ft	86.13092 psf	1,043.449 psf	509.01508 psf	0 psf	0 psf	Alluvium-Fine
Slice 20	2,194.0249 ft	33.171373 ft	36.123821 psf	990.43514 psf	507.41633 psf	0 psf	0 psf	Alluvium-Fine
Slice 21	2,195.1544 ft	33.676008 ft	4.6193162 psf	974.56936 psf	515.73159 psf	0 psf	0 psf	Alluvium-Fine
Slice 22	2,196.1544 ft	34.184901 ft	-27.150982 psf	939.92497 psf	499.76697 psf	0 psf	0 psf	Alluvium-Fine
Slice 23	2,197.75 ft	35.049774 ft	-81.145139 psf	954.05744 psf	507.28134 psf	0 psf	0 psf	Alluvium-Fine
Slice 24	2,199.302 ft	35.989334 ft	-139.80205 psf	924.05279 psf	491.32758 psf	0 psf	0 psf	Alluvium-Fine
Slice 25	2,200.302 ft	36.633206 ft	-179.99911 psf	834.12222 psf	481.58069 psf	50 psf	0 psf	Alluvium-Coarse (Top)
Slice 26	2,201 ft	37.122376 ft	-210.53808 psf	1,173.7141 psf	677.64415 psf	50 psf	0 psf	Alluvium-Coarse (Top)
Slice 27	2,202.25 ft	38.05499 ft	-268.76136 psf	928.81072 psf	536.24912 psf	50 psf	0 psf	Alluvium-Coarse (Top)
Slice 28	2,203.6156 ft	39.151564 ft	-337.22067 psf	742.48037 psf	428.67124 psf	50 psf	0 psf	Alluvium-Coarse (Top)
Slice 29	2,205.1087 ft	40.488802 ft	-420.7047 psf	602.72549 psf	347.98372 psf	50 psf	0 psf	New Compacted Fill
Slice 30	2,206.8637 ft	42.233878 ft	-529.65009 psf	432.60854 psf	249.76665 psf	50 psf	0 psf	New Compacted Fill
Slice 31	2,208.6186 ft	44.220228 ft	-653.65832 psf	255.91595 psf	147.75314 psf	50 psf	0 psf	New Compacted Fill
Slice 32	2,210.3735 ft	46.511084 ft	-796.6769 psf	73.398366 psf	42.376567 psf	50 psf	0 psf	New Compacted Fill

Circular, Undrained (Short-Term)

File Information

File Version: 10.02
Title: Shirlington Pedestrian Bridge
Created By: Mathson, Braque D
Last Edited By: Mathson, Braque D
Revision Number: 76
Date: 02/08/2021
Time: 06:31:42 PM
Tool Version: 10.2.2.20559
File Name: Existing Slope.gsz
Directory: C:\Users\bdmathson\OneDrive - Terracon Consultants Inc\Desktop\66\JD205151\Working Files\Calculations-Analyses\
Last Solved Date: 02/08/2021
Last Solved Time: 10:43:51 PM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

Circular, Undrained (Short-Term)

Kind: SLOPE/W
Method: Spencer
Settings
- PWP Conditions from: Piezometric Line
  - Apply Phreatic Correction: No
  - Use Staged Rapid Drawdown: No
- Unit Weight of Water: 62.430189 pcf

Slip Surface
- Direction of movement: Right to Left
- Use Passive Mode: No
- Slip Surface Option: Entry and Exit
- Critical slip surfaces saved: 1
- Optimize Critical Slip Surface Location: No
- Tension Crack Option: (none)

Distribution
- F of S Calculation Option: Constant

Advanced
- Geometry Settings
  - Minimum Slip Surface Depth: 0.1 ft
  - Number of Slices: 30
- Factor of Safety Convergence Settings
  - Maximum Number of Iterations: 100
  - Tolerable difference in F of S: 0.001
- Solution Settings
  - Search Method: Root Finder

Tolerable difference between starting and converged F of S: 3
Maximum iterations to calculate converged lambda: 20
Max Absolute Lambda: 2

Materials

Existing Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 50 psf
Phi': 28 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

Potomac Group

Model: Mohr-Coulomb
Unit Weight: 125 pcf
Cohesion': 0 psf
Phi': 34 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

Alluvium-Fine (Undrained)

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 500 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

New Compacted Fill

Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion': 50 psf
Phi': 30 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

Concrete

Model: High Strength
Unit Weight: 150 pcf
Pore Water Pressure
- Piezometric Line: 1

Alluvium-Coarse (Top)

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 50 psf
Phi': 30 °

Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Alluvium-Coarse (Bottom)

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 0 psf
Phi': 28 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Slip Surface Entry and Exit

Left Type: Range
Left-Zone Left Coordinate: (2,125.75, 32.726744) ft
Left-Zone Right Coordinate: (2,175.9325, 37.000013) ft
Left-Zone Increment: 50
Right Type: Range
Right-Zone Left Coordinate: (2,183.582, 39.714545) ft
Right-Zone Right Coordinate: (2,240.7332, 47.356179) ft
Right-Zone Increment: 50
Radius Increments: 4

Slip Surface Limits

Left Coordinate: (2,125, 0) ft
Right Coordinate: (2,275, 47.25) ft

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	2,139.25 ft	33.75 ft
Coordinate 2	2,170.5 ft	33.75 ft
Coordinate 3	2,188.5 ft	33.75 ft
Coordinate 4	2,275 ft	33.75 ft

Surcharge Loads

Surcharge Load 1

Surcharge (Unit Weight): 75 pcf
Direction: Vertical

Coordinates

	X	Y

	2,200.5 ft	48.000222 ft
	2,253 ft	47.232143 ft

Geometry

Name: Existing Slope (2)

Settings

View: 2D
Element Thickness: 1 ft

Points

	X	Y
Point 1		
Point 2	2,125.25 ft	32.75 ft
Point 3	2,136 ft	32.25 ft
Point 4	2,142.25 ft	35 ft
Point 5	2,163.75 ft	34.5 ft
Point 6	2,174.5194 ft	36.498555 ft
Point 7	2,232.5 ft	46.5 ft
Point 8	2,253.5 ft	47.25 ft
Point 9	2,262.75 ft	48 ft
Point 10	2,263 ft	47.25 ft
Point 11	2,275 ft	47.25 ft
Point 12	2,275 ft	0 ft
Point 13	2,275 ft	36.5 ft
Point 14	2,275 ft	26.75 ft
Point 15	2,200.5 ft	48.000222 ft
Point 16	2,252.25 ft	47.205357 ft
Point 17	2,240.75 ft	46.794643 ft
Point 18	2,197 ft	41.25 ft
Point 19	2,203 ft	41.25 ft
Point 20	2,203 ft	42 ft
Point 21	2,201.5 ft	42 ft
Point 22	2,201.5 ft	47.869972 ft
Point 23	2,200.5 ft	46.5 ft
Point 24	2,198.5 ft	42 ft
Point 25	2,197 ft	42 ft
Point 26	2,201.5 ft	46.5 ft
Point 27	2,200.5 ft	44.5 ft
Point 28	2,216.75 ft	46.486842 ft
Point 29	2,187.4545 ft	41.249984 ft
Point 30	2,125 ft	0 ft
Point 31	2,125.207 ft	26.928325 ft
Point 32	2,275 ft	40.25 ft
Point 33	2,185.0909 ft	40.249999 ft
Point 34	2,275 ft	32 ft

Point 35	2,125.2464 ft	32 ft
Point 36	2,203 ft	39 ft
Point 37	2,203 ft	40.249999 ft
Point 38	2,197 ft	39 ft
Point 39	2,197.0011 ft	40.249999 ft
Point 40	2,198.5 ft	44.5 ft
Point 41	2,195 ft	39 ft
Point 42	2,195 ft	43.470164 ft
Point 43	2,195 ft	40.249999 ft
Point 44	2,195 ft	41.249997 ft
Point 45	2,205.2957 ft	40.249999 ft
Point 46	2,192 ft	40.75 ft

Regions

	Material	Points	Area
Region 1	Alluvium-Coarse (Top)	6,13,32,45,36,38,41,43,33	345.61 ft²
Region 2	Potomac Group	12,30,31,14	4,023.1 ft²
Region 3	New Compacted Fill	28,7,17,16,22,26,21,20,19,37,36,45	104.2 ft²
Region 4	Concrete	19,20,21,26,22,15,23,27,40,24,25,18,39,38,36,37	28.934 ft²
Region 5	New Compacted Fill	18,25,24,40,42,44,43,41,38,39	12.949 ft²
Region 6	Alluvium-Fine (Undrained)	3,4,5,6,13,34,35,2	564.43 ft²
Region 7	Existing Fill	11,10,9,8,16,17,7,28,45,32	427.24 ft²
Region 8	Alluvium-Coarse (Bottom)	14,31,35,34	772.96 ft²
Region 9	Existing Fill	33,43,44,42,29	17.103 ft²

Slip Results

Slip Surfaces Analysed: 7488 of 13005 converged

Current Slip Surface

Slip Surface: 7,798
Factor of Safety: 1.975
Volume: 482.24195 ft³
Weight: 56,893.508 lbf
Resisting Moment: 1,199,341.8 lbf·ft
Activating Moment: 607,198.17 lbf·ft
Resisting Force: 24,663.001 lbf
Activating Force: 12,491.64 lbf

Slip Rank: 1 of 13,005 slip surfaces
Exit: (2,155.7857, 34.685216) ft
Entry: (2,214.9363, 47.694012) ft
Radius: 43.752104 ft
Center: (2,178.578, 72.031676) ft

Slip Slices

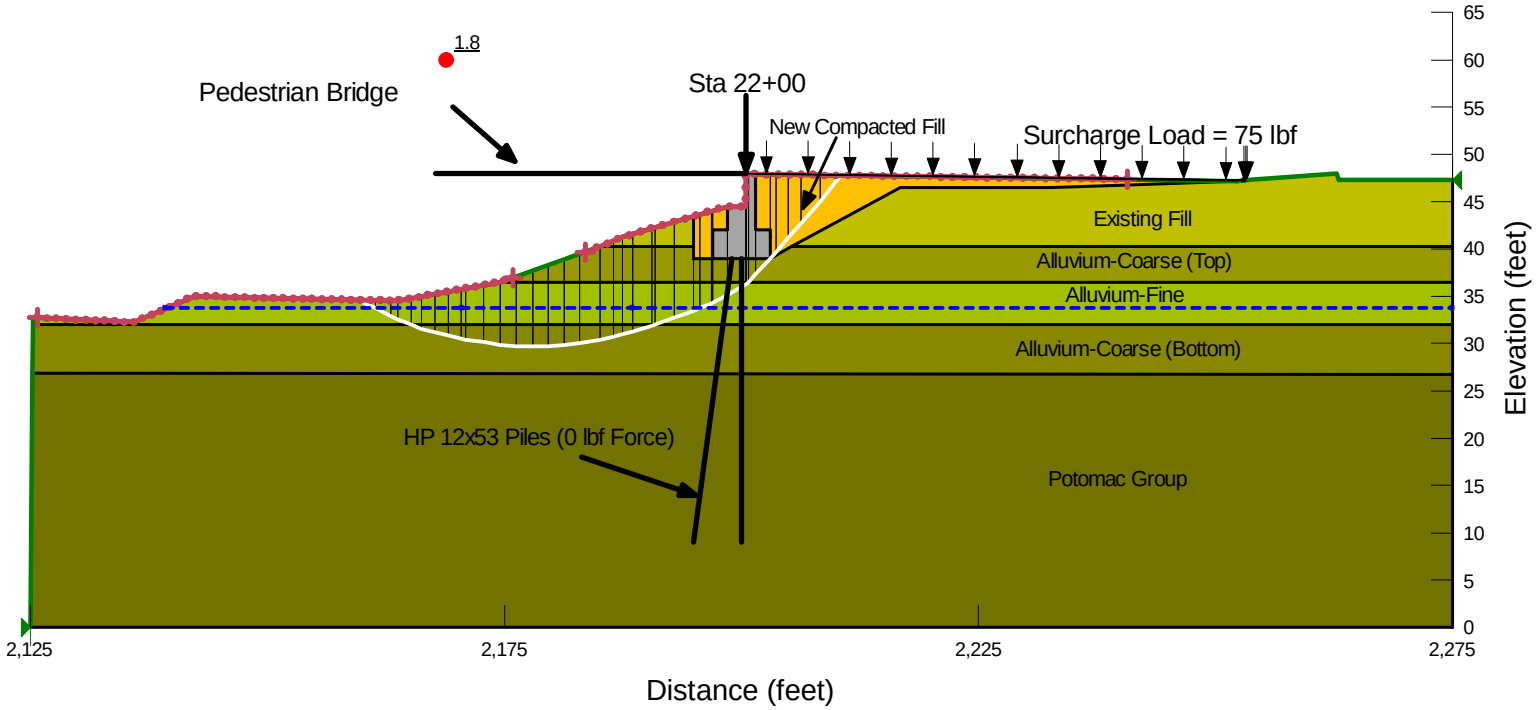
	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	2,156.5899 ft	34.217608 ft	-29.192848 psf	268.53729 psf	0 psf	500 psf	0 psf	Alluvium-Fine (Undrained)
Slice 2	2,158.2762 ft	33.287754 ft	28.858123 psf	362.13319 psf	0 psf	500 psf	0 psf	Alluvium-Fine (Undrained)
Slice 3	2,160.0405 ft	32.412754 ft	83.484538 psf	447.15113 psf	0 psf	500 psf	0 psf	Alluvium-Fine (Undrained)
Slice 4	2,162.3363 ft	31.434435 ft	144.56117 psf	429.29573 psf	151.39605 psf	0 psf	0 psf	Alluvium-Coarse (Bottom)
Slice 5	2,164.875 ft	30.497706 ft	203.04131 psf	564.71358 psf	192.30456 psf	0 psf	0 psf	Alluvium-Coarse (Bottom)
Slice 6	2,167.125 ft	29.821295 ft	245.26981 psf	695.80231 psf	239.55238 psf	0 psf	0 psf	Alluvium-Coarse (Bottom)
Slice 7	2,169.375 ft	29.273906 ft	279.44338 psf	805.12651 psf	279.51068 psf	0 psf	0 psf	Alluvium-Coarse (Bottom)
Slice 8	2,171.5048 ft	28.867106 ft	304.83999 psf	890.87006 psf	311.59772 psf	0 psf	0 psf	Alluvium-Coarse (Bottom)
Slice 9	2,173.5145 ft	28.585336 ft	322.43096 psf	956.53377 psf	337.15845 psf	0 psf	0 psf	Alluvium-Coarse (Bottom)
Slice 10	2,175.5766 ft	28.395511 ft	334.28178 psf	1,031.9943 psf	370.98035 psf	0 psf	0 psf	Alluvium-Coarse (Bottom)
Slice 11	2,177.6908 ft	28.301349 ft	340.16029 psf	1,115.7589 psf	412.3931 psf	0 psf	0 psf	Alluvium-Coarse (Bottom)
Slice 12	2,179.8052 ft	28.309574 ft	339.64685 psf	1,184.1225 psf	449.0157 psf	0 psf	0 psf	Alluvium-Coarse (Bottom)
Slice 13	2,181.9194 ft	28.420242 ft	332.73783 psf	1,237.6765 psf	481.16444 psf	0 psf	0 psf	Alluvium-Coarse (Bottom)
Slice 14	2,184.0338 ft	28.634139 ft	319.38418 psf	1,276.8443 psf	509.09059 psf	0 psf	0 psf	Alluvium-Coarse (Bottom)
						0 psf	0 psf	

Slice 15	2,186.2727 ft	28.978255 ft	297.90094 psf	1,311.5392 psf	538.96105 psf			Alluvium-Coarse (Bottom)
Slice 16	2,187.9772 ft	29.304467 ft	277.53545 psf	1,327.6485 psf	558.355 psf	0 psf	0 psf	Alluvium-Coarse (Bottom)
Slice 17	2,189.5833 ft	29.701114 ft	252.77274 psf	1,316.2125 psf	565.44096 psf	0 psf	0 psf	Alluvium-Coarse (Bottom)
Slice 18	2,191.75 ft	30.324907 ft	213.82922 psf	1,290.1851 psf	572.30859 psf	0 psf	0 psf	Alluvium-Coarse (Bottom)
Slice 19	2,193.9167 ft	31.072745 ft	167.14152 psf	1,249.8377 psf	575.67976 psf	0 psf	0 psf	Alluvium-Coarse (Bottom)
Slice 20	2,195.6167 ft	31.739221 ft	125.53334 psf	1,229.5838 psf	587.03407 psf	0 psf	0 psf	Alluvium-Coarse (Bottom)
Slice 21	2,196.6172 ft	32.173734 ft	98.406583 psf	1,213.5723 psf	0 psf	500 psf	0 psf	Alluvium-Fine (Undrained)
Slice 22	2,197.7506 ft	32.712913 ft	64.745515 psf	1,261.4992 psf	0 psf	500 psf	0 psf	Alluvium-Fine (Undrained)
Slice 23	2,199.131 ft	33.414179 ft	20.965346 psf	1,261.4544 psf	0 psf	500 psf	0 psf	Alluvium-Fine (Undrained)
Slice 24	2,200.131 ft	33.958901 ft	-13.04172 psf	1,189.8656 psf	0 psf	500 psf	0 psf	Alluvium-Fine (Undrained)
Slice 25	2,201 ft	34.466241 ft	-44.715049 psf	1,595.8277 psf	0 psf	500 psf	0 psf	Alluvium-Fine (Undrained)
Slice 26	2,202.25 ft	35.247331 ft	-93.478634 psf	1,328.0748 psf	0 psf	500 psf	0 psf	Alluvium-Fine (Undrained)
Slice 27	2,203.553 ft	36.114481 ft	-147.61499 psf	1,132.9405 psf	0 psf	500 psf	0 psf	Alluvium-Fine (Undrained)
Slice 28	2,204.7008 ft	36.941849 ft	-199.26776 psf	992.77146 psf	573.17687 psf	50 psf	0 psf	Alluvium-Coarse (Top)
Slice 29	2,206.1336 ft	38.06449 ft	-269.35445 psf	866.19292 psf	500.09672 psf	50 psf	0 psf	Alluvium-Coarse (Top)
Slice 30	2,207.8095 ft	39.497131 ft	-358.79446 psf	712.95506 psf	411.6248 psf	50 psf	0 psf	Alluvium-Coarse (Top)
Slice 31	2,209.5258 ft	41.129612 ft	-460.71059 psf	556.47057 psf	295.88065 psf	50 psf	0 psf	Existing Fill
Slice 32	2,211.2824 ft	42.998606 ft	-577.39221 psf	379.54383 psf	201.80703 psf	50 psf	0 psf	Existing Fill
						50 psf	0 psf	

Slice 33	2,213.5485 ft	45.840999 ft	-754.84335 psf	129.08335 psf	74.526309 psf			New Compacted Fill

Project: Shirlington Pedestrian Bridge
Project Number: JD205151
Title: Shirlington Pedestrian Bridge
Name: Optimized, Drained (Long-Term)

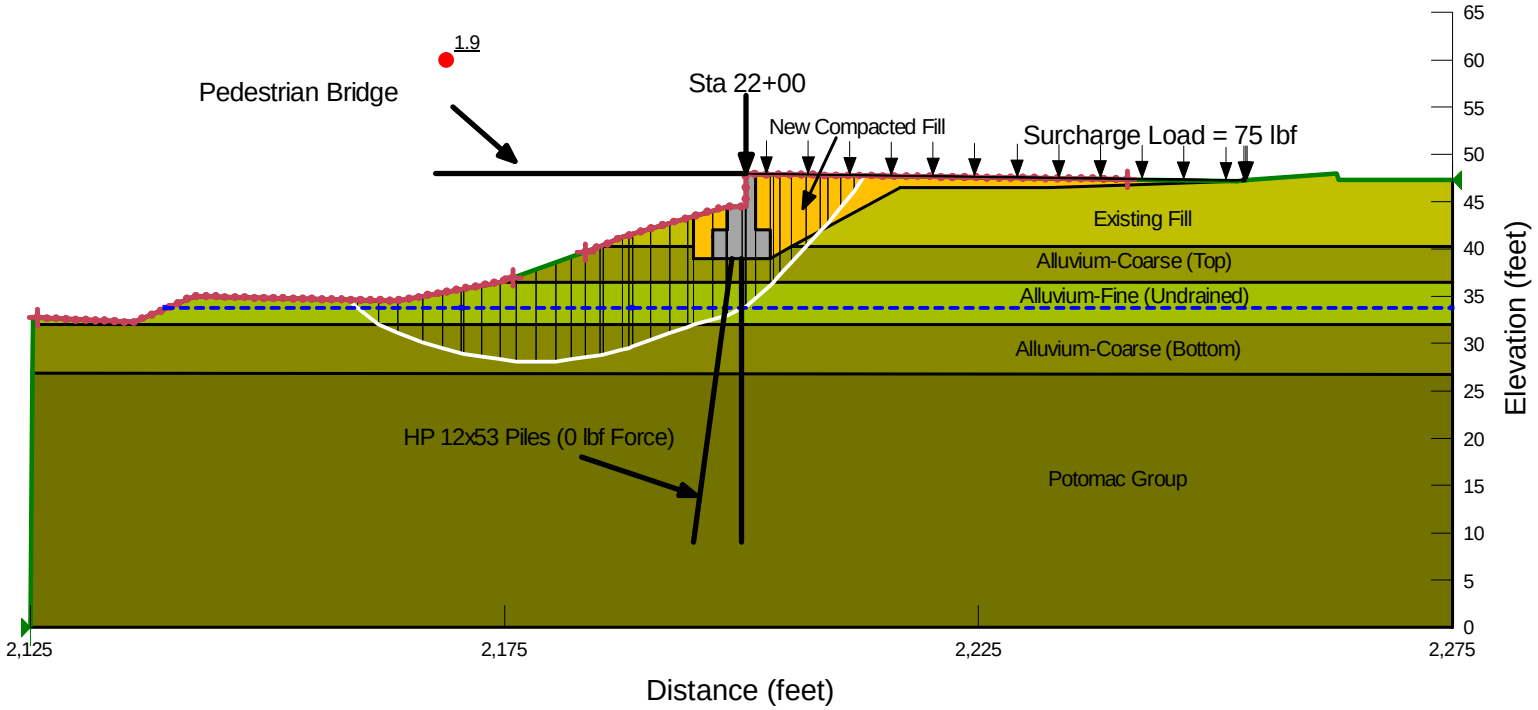
Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Alluvium-Coarse (Bottom)	Mohr-Coulomb	115	0	28
	Alluvium-Coarse (Top)	Mohr-Coulomb	115	50	30
	Alluvium-Fine	Mohr-Coulomb	115	0	28
	Concrete	High Strength	150		
	Existing Fill	Mohr-Coulomb	115	50	28
	New Compacted Fill	Mohr-Coulomb	120	50	30
	Potomac Formation	Mohr-Coulomb	125	0	34



Note: Data point is randomly placed to show factor of safety value only and does not represent the true center of the critical slip surface. Actual coordinates of the center of critical slip surface are: (2,177.9186, 69.641822) ft

Project: Shirlington Pedestrian Bridge
Project Number: JD205151
Title: Shirlington Pedestrian Bridge
Name: Optimized, Undrained (Short-Term)

Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Alluvium-Coarse (Bottom)	Mohr-Coulomb	115	0	28
	Alluvium-Coarse (Top)	Mohr-Coulomb	115	50	30
	Alluvium-Fine (Undrained)	Mohr-Coulomb	115	500	0
	Concrete	High Strength	150		
	Existing Fill	Mohr-Coulomb	115	50	28
	New Compacted Fill	Mohr-Coulomb	120	50	30
	Potomac Formation	Mohr-Coulomb	125	0	34



Note: Data point is randomly placed to show factor of safety value only and does not represent the true center of the critical slip surface. Actual coordinates of the center of critical slip surface are: (2,178.578, 72.031676) ft

Optimized, Drained (Long-Term)

File Information

File Version: 10.02
Title: Shirlington Pedestrian Bridge
Created By: Mathson, Braque D
Last Edited By: Mathson, Braque D
Revision Number: 67
Date: 02/02/2021
Time: 02:40:42 PM
Tool Version: 10.2.2.20559
File Name: Existing Slope.gsz
Directory: \\dcmetrowest1\Data\Projects\2020\JD205151\Working Files\Calculations-Analyses\Slope Stability\
Last Solved Date: 02/02/2021
Last Solved Time: 02:41:02 PM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

Optimized, Drained (Long-Term)

Kind: SLOPE/W
Method: Spencer
Settings
PWP Conditions from: Piezometric Line
Apply Phreatic Correction: No
Use Staged Rapid Drawdown: No
Unit Weight of Water: 62.430189 pcf
Slip Surface
Direction of movement: Right to Left
Use Passive Mode: No
Slip Surface Option: Entry and Exit
Critical slip surfaces saved: 1
Optimize Critical Slip Surface Location: Yes
Optimizations Settings
Maximum Iterations: 2,000
Starting Points: 8
Ending Points: 16
Driving Side Maximum Convex Angle: 5 °
Resisting Side Maximum Convex Angle: 1 °
Tension Crack Option: (none)
Distribution
F of S Calculation Option: Constant
Advanced
Geometry Settings
Minimum Slip Surface Depth: 0.1 ft
Number of Slices: 30

Factor of Safety Convergence Settings
Maximum Number of Iterations: 100
Tolerable difference in F of S: 0.001
Solution Settings
Search Method: Root Finder
Tolerable difference between starting and converged F of S: 3
Maximum iterations to calculate converged lambda: 20
Max Absolute Lambda: 2

Materials

Existing Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 50 psf
Phi': 28 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Alluvium-Fine

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 50 psf
Phi': 28 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Potomac Group

Model: Mohr-Coulomb
Unit Weight: 125 pcf
Cohesion': 50 psf
Phi': 34 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

New Compacted Fill

Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion': 50 psf
Phi': 30 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Concrete

Model: High Strength
Unit Weight: 150 pcf
Pore Water Pressure
Piezometric Line: 1

Alluvium-Coarse (Top)

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 50 psf
Phi': 30 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Slip Surface Entry and Exit

Left Type: Range
Left-Zone Left Coordinate: (2,125.75, 32.726744) ft
Left-Zone Right Coordinate: (2,175.9325, 37.000013) ft
Left-Zone Increment: 50
Right Type: Range
Right-Zone Left Coordinate: (2,183.582, 39.714545) ft
Right-Zone Right Coordinate: (2,240.7332, 47.356179) ft
Right-Zone Increment: 50
Radius Increments: 4

Slip Surface Limits

Left Coordinate: (2,125, 0) ft
Right Coordinate: (2,275, 47.25) ft

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	2,139.25 ft	33.75 ft
Coordinate 2	2,170.5 ft	33.75 ft
Coordinate 3	2,188.5 ft	33.75 ft
Coordinate 4	2,275 ft	33.75 ft

Surcharge Loads

Surcharge Load 1

Surcharge (Unit Weight): 75 pcf
Direction: Vertical

Coordinates

	X	Y
	2,200.5 ft	48.000222 ft
	2,253 ft	47.232143 ft

Geometry

Name: Existing Slope

Settings

View: 2D
Element Thickness: 1 ft

Points

	X	Y
Point 1		
Point 2	2,125.25 ft	32.75 ft
Point 3	2,136 ft	32.25 ft
Point 4	2,142.25 ft	35 ft
Point 5	2,163.75 ft	34.5 ft
Point 6	2,174.5194 ft	36.498555 ft
Point 7	2,232.5 ft	46.5 ft
Point 8	2,253.5 ft	47.25 ft
Point 9	2,262.75 ft	48 ft
Point 10	2,263 ft	47.25 ft
Point 11	2,275 ft	47.25 ft
Point 12	2,275 ft	0 ft
Point 13	2,275 ft	36.5 ft
Point 14	2,275 ft	26.75 ft
Point 15	2,200.5 ft	48.000222 ft
Point 16	2,252.25 ft	47.205357 ft
Point 17	2,240.75 ft	46.794643 ft
Point 18	2,197 ft	41.25 ft
Point 19	2,203 ft	41.25 ft
Point 20	2,203 ft	42 ft
Point 21	2,201.5 ft	42 ft
Point 22	2,201.5 ft	47.869972 ft
Point 23	2,200.5 ft	46.5 ft
Point 24	2,198.5 ft	42 ft
Point 25	2,197 ft	42 ft
Point 26	2,201.5 ft	46.5 ft
Point 27	2,200.5 ft	44.5 ft
Point 28	2,216.75 ft	46.486842 ft
Point 29	2,187.4545 ft	41.249984 ft
Point 30	2,125 ft	0 ft
Point 31	2,125.207 ft	26.928325 ft
Point 32	2,275 ft	40.25 ft
Point 33	2,185.0909 ft	40.249999 ft
Point 34	2,275 ft	32 ft
Point 35	2,125.2464 ft	32 ft
Point 36	2,203 ft	39 ft
Point 37	2,203 ft	40.249999 ft
Point 38	2,197 ft	39 ft
Point 39	2,197.0011 ft	40.249999 ft

Point 40	2,198.5 ft	44.5 ft
Point 41	2,195 ft	39 ft
Point 42	2,195 ft	43.470164 ft
Point 43	2,195 ft	40.249999 ft
Point 44	2,195 ft	41.249997 ft
Point 45	2,205.2957 ft	40.249999 ft

Regions

	Material	Points	Area
Region 1	Alluvium-Coarse (Top)	6,13,32,45,36,38,41,43,33	345.61 ft²
Region 2	Potomac Group	12,30,31,14	4,023.1 ft²
Region 3	New Compacted Fill	28,7,17,16,22,26,21,20,19,37,36,45	104.2 ft²
Region 4	Concrete	19,20,21,26,22,15,23,27,40,24,25,18,39,38,36,37	28.934 ft²
Region 5	New Compacted Fill	18,25,24,40,42,44,43,41,38,39	12.949 ft²
Region 6	Alluvium-Fine	3,4,5,6,13,34,35,2	564.43 ft²
Region 7	Existing Fill	11,10,9,8,16,17,7,28,45,32	427.24 ft²
Region 8	Alluvium-Coarse (Top)	14,31,35,34	772.96 ft²
Region 9	Existing Fill	29,33,43,44	8.7272 ft²
Region 10	Existing Fill	29,44,42	8.3761 ft²

Slip Results

Slip Surfaces Analysed: 7647 of 13006 converged

Current Slip Surface

Slip Surface: 13,006
Factor of Safety: 2.083
Volume: 327.22727 ft³
Weight: 38,939.702 lbf
Resisting Moment: 863,673.44 lbf·ft
Activating Moment: 414,547.55 lbf·ft
Resisting Force: 20,337.502 lbf
Activating Force: 9,761.1756 lbf
Slip Rank: 1 of 13,006 slip surfaces
Exit: (2,161.8405, 34.544407) ft
Entry: (2,211.1828, 47.743168) ft
Radius: 24.892475 ft
Center: (2,178.8085, 68.910578) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
						50 psf	0 psf	

Slice 1	2,162.5587 ft	34.147204 ft	-24.797504 psf	96.079749 psf	51.086509 psf			Alluvium-Fine
Slice 2	2,163.5134 ft	33.61916 ft	8.1683883 psf	182.17541 psf	92.521176 psf	50 psf	0 psf	Alluvium-Fine
Slice 3	2,163.8275 ft	33.445429 ft	19.014416 psf	210.79058 psf	101.96919 psf	50 psf	0 psf	Alluvium-Fine
Slice 4	2,164.9194 ft	32.983012 ft	47.883205 psf	285.20171 psf	126.18449 psf	50 psf	0 psf	Alluvium-Fine
Slice 5	2,166.9415 ft	32.281743 ft	91.663593 psf	407.22692 psf	167.788 psf	50 psf	0 psf	Alluvium-Fine
Slice 6	2,169.0103 ft	31.703451 ft	127.76644 psf	546.47823 psf	241.74336 psf	50 psf	0 psf	Alluvium-Coarse (Top)
Slice 7	2,170.2856 ft	31.369679 ft	148.60391 psf	586.76799 psf	252.97415 psf	50 psf	0 psf	Alluvium-Coarse (Top)
Slice 8	2,171.4722 ft	31.163665 ft	161.46535 psf	643.40013 psf	278.24518 psf	50 psf	0 psf	Alluvium-Coarse (Top)
Slice 9	2,173.4166 ft	30.826086 ft	182.54051 psf	736.19934 psf	319.65507 psf	50 psf	0 psf	Alluvium-Coarse (Top)
Slice 10	2,174.4541 ft	30.651789 ft	193.42193 psf	746.17736 psf	319.1335 psf	50 psf	0 psf	Alluvium-Coarse (Top)
Slice 11	2,175.7118 ft	30.545713 ft	200.04427 psf	815.75191 psf	355.47897 psf	50 psf	0 psf	Alluvium-Coarse (Top)
Slice 12	2,177.8257 ft	30.470409 ft	204.74547 psf	868.67145 psf	383.31784 psf	50 psf	0 psf	Alluvium-Coarse (Top)
Slice 13	2,179.6689 ft	30.52094 ft	201.59084 psf	942.32633 psf	427.66383 psf	50 psf	0 psf	Alluvium-Coarse (Top)
Slice 14	2,181.5697 ft	30.686589 ft	191.24933 psf	947.12674 psf	436.40603 psf	50 psf	0 psf	Alluvium-Coarse (Top)
Slice 15	2,183.5282 ft	30.967357 ft	173.72093 psf	994.99252 psf	474.16137 psf	50 psf	0 psf	Alluvium-Coarse (Top)
Slice 16	2,184.7992 ft	31.172148 ft	160.93581 psf	985.06308 psf	475.8101 psf	50 psf	0 psf	Alluvium-Coarse (Top)
Slice 17	2,185.4929 ft	31.325304 ft	151.37426 psf	998.36441 psf	489.00999 psf	50 psf	0 psf	Alluvium-Coarse (Top)
Slice 18	2,186.6746 ft	31.623891 ft	132.73337 psf	996.94977 psf	498.95557 psf	50 psf	0 psf	Alluvium-Coarse (Top)
Slice 19	2,187.7635 ft	31.916865 ft	114.44298 psf	1,010.5746 psf	517.38182 psf	50 psf	0 psf	Alluvium-Coarse (Top)
						50 psf	0 psf	

Slice 20	2,188.2862 ft	32.057524 ft	105.66161 psf	1,012.2798 psf	482.05743 psf			Alluvium-Fine
Slice 21	2,189.3778 ft	32.351255 ft	87.323904 psf	1,015.147 psf	493.33227 psf	50 psf	0 psf	Alluvium-Fine
Slice 22	2,191.1336 ft	32.82367 ft	57.830932 psf	1,019.7583 psf	511.46587 psf	50 psf	0 psf	Alluvium-Fine
Slice 23	2,192.9939 ft	33.404939 ft	21.542223 psf	976.68591 psf	507.85891 psf	50 psf	0 psf	Alluvium-Fine
Slice 24	2,194.4882 ft	33.92974 ft	-11.221172 psf	967.40192 psf	514.37673 psf	50 psf	0 psf	Alluvium-Fine
Slice 25	2,195.9824 ft	34.454517 ft	-43.98313 psf	979.97938 psf	521.06428 psf	50 psf	0 psf	Alluvium-Fine
Slice 26	2,196.983 ft	34.808829 ft	-66.102922 psf	905.32573 psf	481.37023 psf	50 psf	0 psf	Alluvium-Fine
Slice 27	2,197.7506 ft	35.202123 ft	-90.656283 psf	965.45426 psf	513.34114 psf	50 psf	0 psf	Alluvium-Fine
Slice 28	2,199.4349 ft	36.06521 ft	-144.539 psf	967.30065 psf	514.32288 psf	50 psf	0 psf	Alluvium-Fine
Slice 29	2,200.4349 ft	36.60461 ft	-178.21383 psf	763.48526 psf	440.79842 psf	50 psf	0 psf	Alluvium-Coarse (Top)
Slice 30	2,201 ft	37.128668 ft	-210.93088 psf	1,086.9315 psf	627.54017 psf	50 psf	0 psf	Alluvium-Coarse (Top)
Slice 31	2,201.9227 ft	37.98443 ft	-264.35627 psf	889.30239 psf	513.43898 psf	50 psf	0 psf	Alluvium-Coarse (Top)
Slice 32	2,202.6727 ft	38.703298 ft	-309.23534 psf	807.29799 psf	466.09371 psf	50 psf	0 psf	Alluvium-Coarse (Top)
Slice 33	2,203.7318 ft	39.760904 ft	-375.26187 psf	658.6415 psf	380.26685 psf	50 psf	0 psf	New Compacted Fill
Slice 34	2,205.1955 ft	41.22245 ft	-466.50644 psf	536.62677 psf	309.82161 psf	50 psf	0 psf	New Compacted Fill
Slice 35	2,206.6591 ft	42.683995 ft	-557.75101 psf	414.61204 psf	239.37637 psf	50 psf	0 psf	New Compacted Fill
Slice 36	2,208.0341 ft	44.117075 ft	-647.21843 psf	283.91764 psf	163.91992 psf	50 psf	0 psf	New Compacted Fill
Slice 37	2,209.3204 ft	45.521688 ft	-734.90872 psf	170.62207 psf	98.508697 psf	50 psf	0 psf	New Compacted Fill
Slice 38	2,210.5732 ft	46.983581 ft	-826.17497 psf	47.777115 psf	27.58413 psf	50 psf	0 psf	New Compacted Fill

Optimized, Undrained (Short-Term) (2)

File Information

File Version: 10.02
Title: Shirlington Pedestrian Bridge
Created By: Mathson, Braque D
Last Edited By: Mathson, Braque D
Revision Number: 67
Date: 02/02/2021
Time: 02:40:42 PM
Tool Version: 10.2.2.20559
File Name: Existing Slope.gsz
Directory: \\dcmetrowest1\Data\Projects\2020\JD205151\Working Files\Calculations-Analyses\Slope Stability\
Last Solved Date: 02/02/2021
Last Solved Time: 02:41:08 PM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

Optimized, Undrained (Short-Term) (2)

Kind: SLOPE/W
Method: Spencer
Settings
PWP Conditions from: Piezometric Line
Apply Phreatic Correction: No
Use Staged Rapid Drawdown: No
Unit Weight of Water: 62.430189 pcf
Slip Surface
Direction of movement: Right to Left
Use Passive Mode: No
Slip Surface Option: Entry and Exit
Critical slip surfaces saved: 1
Optimize Critical Slip Surface Location: Yes
Optimizations Settings
Maximum Iterations: 2,000
Starting Points: 8
Ending Points: 16
Driving Side Maximum Convex Angle: 5 °
Resisting Side Maximum Convex Angle: 1 °
Tension Crack Option: (none)
Distribution
F of S Calculation Option: Constant
Advanced
Geometry Settings
Minimum Slip Surface Depth: 0.1 ft
Number of Slices: 30

Factor of Safety Convergence Settings
Maximum Number of Iterations: 100
Tolerable difference in F of S: 0.001
Solution Settings
Search Method: Root Finder
Tolerable difference between starting and converged F of S: 3
Maximum iterations to calculate converged lambda: 20
Max Absolute Lambda: 2

Materials

Existing Fill

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 50 psf
Phi': 28 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Potomac Group

Model: Mohr-Coulomb
Unit Weight: 125 pcf
Cohesion': 50 psf
Phi': 34 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Alluvium-Fine (Undrained)

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 500 psf
Phi': 0 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

New Compacted Fill

Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion': 50 psf
Phi': 30 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Concrete

Model: High Strength
Unit Weight: 150 pcf
Pore Water Pressure
Piezometric Line: 1

Alluvium-Coarse (Top)

Model: Mohr-Coulomb
Unit Weight: 115 pcf
Cohesion': 50 psf
Phi': 30 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Slip Surface Entry and Exit

Left Type: Range
Left-Zone Left Coordinate: (2,125.75, 32.726744) ft
Left-Zone Right Coordinate: (2,175.9325, 37.000013) ft
Left-Zone Increment: 50
Right Type: Range
Right-Zone Left Coordinate: (2,183.582, 39.714545) ft
Right-Zone Right Coordinate: (2,240.7332, 47.356179) ft
Right-Zone Increment: 50
Radius Increments: 4

Slip Surface Limits

Left Coordinate: (2,125, 0) ft
Right Coordinate: (2,275, 47.25) ft

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	2,139.25 ft	33.75 ft
Coordinate 2	2,170.5 ft	33.75 ft
Coordinate 3	2,188.5 ft	33.75 ft
Coordinate 4	2,275 ft	33.75 ft

Surcharge Loads

Surcharge Load 1

Surcharge (Unit Weight): 75 pcf
Direction: Vertical

Coordinates

	X	Y
	2,200.5 ft	48.000222 ft
	2,253 ft	47.232143 ft

Geometry

Name: Existing Slope

Settings

View: 2D
Element Thickness: 1 ft

Points

	X	Y
Point 1		
Point 2	2,125.25 ft	32.75 ft
Point 3	2,136 ft	32.25 ft
Point 4	2,142.25 ft	35 ft
Point 5	2,163.75 ft	34.5 ft
Point 6	2,174.5194 ft	36.498555 ft
Point 7	2,232.5 ft	46.5 ft
Point 8	2,253.5 ft	47.25 ft
Point 9	2,262.75 ft	48 ft
Point 10	2,263 ft	47.25 ft
Point 11	2,275 ft	47.25 ft
Point 12	2,275 ft	0 ft
Point 13	2,275 ft	36.5 ft
Point 14	2,275 ft	26.75 ft
Point 15	2,200.5 ft	48.000222 ft
Point 16	2,252.25 ft	47.205357 ft
Point 17	2,240.75 ft	46.794643 ft
Point 18	2,197 ft	41.25 ft
Point 19	2,203 ft	41.25 ft
Point 20	2,203 ft	42 ft
Point 21	2,201.5 ft	42 ft
Point 22	2,201.5 ft	47.869972 ft
Point 23	2,200.5 ft	46.5 ft
Point 24	2,198.5 ft	42 ft
Point 25	2,197 ft	42 ft
Point 26	2,201.5 ft	46.5 ft
Point 27	2,200.5 ft	44.5 ft
Point 28	2,216.75 ft	46.486842 ft
Point 29	2,187.4545 ft	41.249984 ft
Point 30	2,125 ft	0 ft
Point 31	2,125.207 ft	26.928325 ft
Point 32	2,275 ft	40.25 ft
Point 33	2,185.0909 ft	40.249999 ft
Point 34	2,275 ft	32 ft
Point 35	2,125.2464 ft	32 ft
Point 36	2,203 ft	39 ft
Point 37	2,203 ft	40.249999 ft
Point 38	2,197 ft	39 ft
Point 39	2,197.0011 ft	40.249999 ft
Point 40	2,198.5 ft	44.5 ft
Point 41	2,195 ft	39 ft

Point 42	2,195 ft	43.470164 ft
Point 43	2,195 ft	40.249999 ft
Point 44	2,195 ft	41.249997 ft
Point 45	2,205.2957 ft	40.249999 ft

Regions

	Material	Points	Area
Region 1	Alluvium-Coarse (Top)	6,13,32,45,36,38,41,43,33	345.61 ft²
Region 2	Potomac Group	12,30,31,14	4,023.1 ft²
Region 3	New Compacted Fill	28,7,17,16,22,26,21,20,19,37,36,45	104.2 ft²
Region 4	Concrete	19,20,21,26,22,15,23,27,40,24,25,18,39,38,36,37	28.934 ft²
Region 5	New Compacted Fill	18,25,24,40,42,44,43,41,38,39	12.949 ft²
Region 6	Alluvium-Fine (Undrained)	3,4,5,6,13,34,35,2	564.43 ft²
Region 7	Existing Fill	11,10,9,8,16,17,7,28,45,32	427.24 ft²
Region 8	Alluvium-Coarse (Top)	14,31,35,34	772.96 ft²
Region 9	Existing Fill	29,33,43,44	8.7272 ft²
Region 10	New Compacted Fill	29,44,42	8.3761 ft²

Slip Results

Slip Surfaces Analysed: 7497 of 13006 converged

Current Slip Surface

Slip Surface: 13,006
Factor of Safety: 2.126
Volume: 402.43994 ft³
Weight: 47,694.012 lbf
Resisting Moment: 1,076,639.9 lbf·ft
Activating Moment: 506,296.57 lbf·ft
Resisting Force: 23,110.585 lbf
Activating Force: 10,868.568 lbf
Slip Rank: 1 of 13,006 slip surfaces
Exit: (2,160.4286, 34.577241) ft
Entry: (2,212.8934, 47.720766) ft
Radius: 26.19093 ft
Center: (2,179.4937, 71.294543) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	2,160.9535 ft	34.163621 ft	-25.822412 psf	328.73144 psf	0 psf	500 psf	0 psf	Alluvium-Fine (Undrained)
Slice 2	2,162.591 ft	32.873275 ft	54.734107 psf	499.18335 psf	0 psf	500 psf	0 psf	Alluvium-Fine (Undrained)

Slice 3	2,163.7268 ft	31.988316 ft	109.98224 psf	365.74599 psf	147.66527 psf	50 psf	0 psf	Alluvium-Coarse (Top)
Slice 4	2,164.5973 ft	31.679381 ft	129.26911 psf	430.66552 psf	174.0113 psf	50 psf	0 psf	Alluvium-Coarse (Top)
Slice 5	2,166.2919 ft	31.077978 ft	166.81481 psf	558.43415 psf	226.10153 psf	50 psf	0 psf	Alluvium-Coarse (Top)
Slice 6	2,168.4138 ft	30.444251 ft	206.37853 psf	668.59605 psf	266.86141 psf	50 psf	0 psf	Alluvium-Coarse (Top)
Slice 7	2,170.0943 ft	30.044568 ft	231.33082 psf	728.57824 psf	287.08593 psf	50 psf	0 psf	Alluvium-Coarse (Top)
Slice 8	2,171.4415 ft	29.823241 ft	245.14834 psf	789.35262 psf	314.19649 psf	50 psf	0 psf	Alluvium-Coarse (Top)
Slice 9	2,173.3245 ft	29.5139 ft	264.46055 psf	874.29466 psf	352.08789 psf	50 psf	0 psf	Alluvium-Coarse (Top)
Slice 10	2,174.3927 ft	29.34748 ft	274.85013 psf	891.20564 psf	355.85302 psf	50 psf	0 psf	Alluvium-Coarse (Top)
Slice 11	2,175.763 ft	29.220416 ft	282.78279 psf	965.88331 psf	394.38827 psf	50 psf	0 psf	Alluvium-Coarse (Top)
Slice 12	2,177.9443 ft	29.138633 ft	287.88853 psf	1,014.5867 psf	419.55938 psf	50 psf	0 psf	Alluvium-Coarse (Top)
Slice 13	2,179.8197 ft	29.205698 ft	283.70162 psf	1,086.2198 psf	463.33407 psf	50 psf	0 psf	Alluvium-Coarse (Top)
Slice 14	2,181.8219 ft	29.403393 ft	271.35949 psf	1,091.3131 psf	473.40045 psf	50 psf	0 psf	Alluvium-Coarse (Top)
Slice 15	2,183.9508 ft	29.731717 ft	250.86217 psf	1,139.764 psf	513.20769 psf	50 psf	0 psf	Alluvium-Coarse (Top)
Slice 16	2,185.0531 ft	29.906535 ft	239.94824 psf	1,104.6799 psf	499.25306 psf	50 psf	0 psf	Alluvium-Coarse (Top)
Slice 17	2,186.2727 ft	30.250349 ft	218.4839 psf	1,122.3024 psf	521.81986 psf	50 psf	0 psf	Alluvium-Coarse (Top)
Slice 18	2,187.9068 ft	30.711013 ft	189.72456 psf	1,140.6863 psf	549.03803 psf	50 psf	0 psf	Alluvium-Coarse (Top)
Slice 19	2,188.4295 ft	30.861441 ft	180.3333 psf	1,121.4238 psf	543.33885 psf	50 psf	0 psf	Alluvium-Coarse (Top)
Slice 20	2,189.2296 ft	31.121738 ft	164.08289 psf	1,119.3733 psf	551.53717 psf	50 psf	0 psf	Alluvium-Coarse (Top)

Slice 21	2,190.6887 ft	31.596489 ft	134.44408 psf	1,115.6334 psf	566.48992 psf	50 psf	0 psf	Alluvium-Coarse (Top)
Slice 22	2,191.7611 ft	31.916933 ft	114.43875 psf	1,156.2615 psf	601.49664 psf	50 psf	0 psf	Alluvium-Coarse (Top)
Slice 23	2,192.8279 ft	32.175462 ft	98.298721 psf	1,166.9305 psf	0 psf	500 psf	0 psf	Alluvium-Fine (Undrained)
Slice 24	2,194.276 ft	32.526385 ft	76.390503 psf	1,177.2133 psf	0 psf	500 psf	0 psf	Alluvium-Fine (Undrained)
Slice 25	2,196 ft	32.944185 ft	50.307188 psf	1,200.1935 psf	0 psf	500 psf	0 psf	Alluvium-Fine (Undrained)
Slice 26	2,197.3245 ft	33.265149 ft	30.269312 psf	1,295.5003 psf	0 psf	500 psf	0 psf	Alluvium-Fine (Undrained)
Slice 27	2,198.0745 ft	33.536289 ft	13.342041 psf	1,196.6502 psf	0 psf	500 psf	0 psf	Alluvium-Fine (Undrained)
Slice 28	2,198.5234 ft	33.739401 ft	0.66172006 psf	1,257.8662 psf	0 psf	500 psf	0 psf	Alluvium-Fine (Undrained)
Slice 29	2,199.5234 ft	34.191786 ft	-27.580791 psf	1,210.0961 psf	0 psf	500 psf	0 psf	Alluvium-Fine (Undrained)
Slice 30	2,200.5163 ft	34.640946 ft	-55.621934 psf	1,644.6032 psf	0 psf	500 psf	0 psf	Alluvium-Fine (Undrained)
Slice 31	2,201.0163 ft	35.090968 ft	-83.716884 psf	1,377.0334 psf	0 psf	500 psf	0 psf	Alluvium-Fine (Undrained)
Slice 32	2,202.0274 ft	36.016287 ft	-141.48473 psf	1,132.4404 psf	0 psf	500 psf	0 psf	Alluvium-Fine (Undrained)
Slice 33	2,202.6585 ft	36.593825 ft	-177.54054 psf	1,033.2921 psf	596.57147 psf	50 psf	0 psf	Alluvium-Coarse (Top)
Slice 34	2,202.8811 ft	36.81811 ft	-191.5427 psf	954.93158 psf	551.33001 psf	50 psf	0 psf	Alluvium-Coarse (Top)
Slice 35	2,204.1478 ft	38.196921 ft	-277.6221 psf	780.64073 psf	450.70314 psf	50 psf	0 psf	Alluvium-Coarse (Top)
Slice 36	2,205.6649 ft	39.848156 ft	-380.70903 psf	645.6569 psf	372.77019 psf	50 psf	0 psf	Alluvium-Coarse (Top)
Slice 37	2,206.4036 ft	40.652236 ft	-430.90788 psf	587.64763 psf	312.45779 psf	50 psf	0 psf	Existing Fill
Slice 38	2,206.8932 ft	41.18511 ft	-464.17534 psf	536.1405 psf	309.54086 psf	50 psf	0 psf	New Compacted Fill
						50 psf	0 psf	

Slice 39	2,207.6944 ft	42.061609 ft	-518.8953 psf	461.91322 psf	266.68572 psf			New Compacted Fill
Slice 40	2,209.0566 ft	43.55333 ft	-612.02376 psf	337.68039 psf	194.95986 psf	50 psf	0 psf	New Compacted Fill
Slice 41	2,210.5267 ft	45.154585 ft	-711.99038 psf	205.19394 psf	118.46878 psf	50 psf	0 psf	New Compacted Fill
Slice 42	2,212.1045 ft	46.865372 ft	-818.79516 psf	62.207925 psf	35.915762 psf	50 psf	0 psf	New Compacted Fill

REVISED ON 1/24/2022

EXHIBIT G

ARLINGTON
VIRGINIA

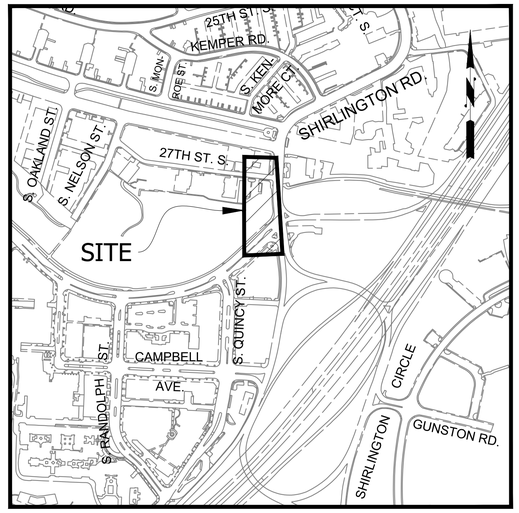
ENGINEER
DEPARTMENT OF
ENVIRONMENTAL SERVICES

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

OWNER
DES/OD/WSS

CONTRACTOR
TO BE DETERMINED

LOCATION MAP



0 600 1200
GRAPHIC SCALE

CONSTRUCTION DRAWINGS FOR:

SHIRLINGTON ROAD PEDESTRIAN BRIDGE
SHIRLINGTON ROAD

PROJECT NUMBER: BR02

GENERAL NOTES:

GENERAL CONSTRUCTION NOTES

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

STORMWATER AND ENVIRONMENTAL PROTECTION

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

TREE PROTECTION

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

TRAFFIC CONTROL

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

WATER DISTRIBUTION, STORM AND SANITARY SEWER SYSTEMS

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

FIRE DEPARTMENT NOTES:

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

SHEET LIST

SWM#

SWM# 22-0124

ADT

18,000 - SHIRLINGTON ROAD (FROM QUAKER LANE TO FOUR MILES RUN DRIVE) - 2018 - SOURCE OF COUNT (VDOT)
11,000 - S. ARLINGTON MILLS DRIVE (FROM WALTER REED DRIVE TO SHIRLINGTON ROAD) - 2018 - SOURCE OF COUNT (VDOT)

STREET CLASSIFICATION

SHIRLINGTON ROAD - PRINCIPAL ARTERIAL
S. ARLINGTON MILL DRIVE - MINOR ARTERIAL

POSTED SPEED

SHIRLINGTON ROAD - 25 MPH
S. ARLINGTON MILL DRIVE - 30 MPH

ARLINGTON VIRGINIA

Approved: 10/3/2022
Subject to field inspection
LDA22115

DEPARTMENT OF
ENVIRONMENTAL SERVICES
FACILITIES & ENGINEERING DIVISION
ENGINEERING BUREAU
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ARLINGTON, VA 22201
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FAX: 703.228.3606

SEAL

COMMONWEALTH OF VIRGINIA
BRIAN C. GRAHAM
Lic. No. 037140
05-19-2022
PROFESSIONAL ENGINEER

APPROVALS	DATE
DESIGN TEAM ENGINEER SUPERVISOR	9/28/2022
CONSTRUCTION MANAGEMENT SUPERVISOR	10/13/22
WATER/SEWER, STREETS BUREAU CHIEF	10/5/22
TRANSPORTATION DIRECTOR	Dennis M. Leach 10/5/22
PROJECT MANAGER	René Harris 9/27/2022

REVISIONS	DATE

SHIRLINGTON ROAD PEDESTRIAN BRIDGE
BR02
SHIRLINGTON ROAD
COVER

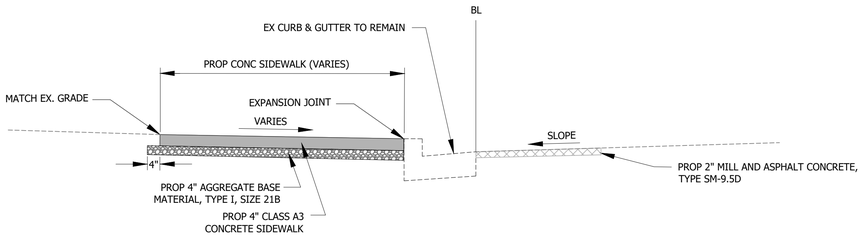
DESIGNED: BD
DRAWN: BD
CHECKED: BG

PLOTTED: JULY 13 2022

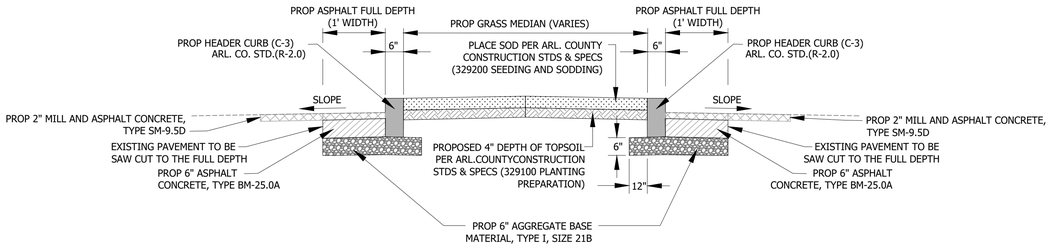
SCALE:

C000.1

FILENAME: BR02-200-COVER.DWG PATH: T:\1009400 - MASTER-ARLINGTON COUNTY ON-CALL\1009450 - SHIRLINGTON RD PEDESTRIAN BRIDGE\07 DESIGN\DWG PLOTTED BY: BRENDA.DUONG

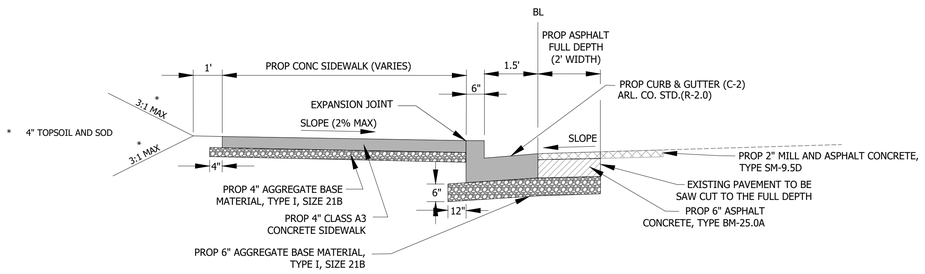


S ARLINGTON MILL ROAD EOP
TYPICAL SECTION
STA. 20+00 TO STA. 20+63
SCALE: NTS

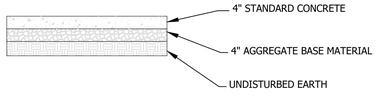


TYPICAL GRASS MEDIAN SECTION
TYPICAL SECTION

SCALE: NTS



S ARLINGTON MILL ROAD EOP
TYPICAL SECTION
STA. 20+63 TO STA. 20+81.75
SCALE: NTS



CONCRETE SIDEWALK ARL STD (R -2.0)
TYPICAL SECTION

SCALE: NTS

PERMIT REQUIREMENTS

THE FOLLOWING PERMITS WILL BE REQUIRED FOR THIS PROJECT.

1. ARLINGTON COUNTY LAND DISTURBING ACTIVITY (LDA) PERMIT
2. ARLINGTON COUNTY PUBLIC RIGHT-OF-WAY (PROW) PERMIT
3. ARLINGTON COUNTY TRANSPORTATION RIGHT-OF-WAY (TROW) PERMIT
4. VDOT PERMITS
5. RPA AND FLOODPLAIN

ARLINGTON VIRGINIA

Approved: 10/3/2022
Subject to field inspection
LDA22115

ARLINGTON VIRGINIA
DEPARTMENT OF ENVIRONMENTAL SERVICES
FACILITIES & ENGINEERING DIVISION
ENGINEERING BUREAU
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SEAL

COMMONWEALTH OF VIRGINIA
BRENDA DUONG
Lic. No. 052964
05-19-2022
PROFESSIONAL ENGINEER

APPROVALS	DATE
DESIGN TEAM ENGINEER SUPERVISOR	9/28/2022
CONSTRUCTION MANAGEMENT SUPERVISOR	10/13/22
WATER, SEWER, STREETS BUREAU CHIEF	10/5/22
TRANSPORTATION DIRECTOR	10/5/22
PROJECT MANAGER	9/27/2022

REVISIONS	DATE

SHIRLINGTON ROAD PEDESTRIAN BRIDGE
BR02
SHIRLINGTON ROAD

TYPICAL SECTIONS

DESIGNED: BD
DRAWN: BD
CHECKED: BG

PLOTTED: JULY 13 2022

SCALE:

AS SHOWN

C004.1

LINETYPE LEGEND

FEATURE	EXISTING	PROPOSED
BUILDING		
CENTERLINE / BASELINE		
COMMUNICATIONS CABLE	COM COM	COM COM
CONTOURS MAJOR; MINOR	250 250	250 250
CRITICAL ROOT ZONE	CRZ CRZ	CRZ CRZ
EASEMENT		
ELECTRIC (UNDERGROUND)	UGE UGE	UGE UGE
FENCE (MATERIAL NOTED)	X X X X X	X X X X X
FIBER OPTIC	FO FO	FO FO
GAS LINE	GAS GAS	GAS GAS
X" GAS LINE (SIZE INCLUDED IF AVAILABLE)		
GUARDRAIL		
HARDSCAPE FEATURE (MATERIAL NOTED)		
LIMITS OF DISTURBANCE	LOD LOD	LOD LOD
LIMITS OF WORK	LOW LOW	LOW LOW
OVERHEAD WIRES		
PAVEMENT MINI SKIP LINE		
PAVEMENT SKIP LINE		
PROPERTY LINE		
RIGHT-OF-WAY LINE		
ROOT PRUNING	RP RP	RP RP
SANITARY SEWER	SAN SAN	SAN SAN
X" SANITARY SEWER (SIZE INCLUDED IF AVAILABLE)		
SILT FENCE	X X X X X	X X X X X
STORM (SIZE NOTED)	STM STM	
STREAM		
STREET LIGHT CONDUIT	SL SL	SL SL
TELEPHONE (UNDERGROUND)	UGT UGT	UGT UGT
TREE LINE		
TREE PROTECTION FENCE	TP TP	TP TP
WALL		
WATER	6"w	
X" WATER (SIZE INCLUDED IF AVAILABLE)		

SYMBOL LEGEND

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

LABEL LEGEND

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

HATCH LEGEND

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

ARLINGTON VIRGINIA

Approved: 10/3/2022
Subject to field inspection
LDA22115

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

SEAL

COMMONWEALTH OF VIRGINIA
BRENDA DUONG
Lic. No. 052964
05-19-2022
PROFESSIONAL ENGINEER

APPROVALS	DATE
DESIGN TEAM ENGINEER SUPERVISOR	9/28/2022
CONSTRUCTION MANAGEMENT SUPERVISOR	10/13/22
WATER/SEWER, STREETS BUREAU CHIEF	10/5/22
TRANSPORTATION DIRECTOR	10/5/22
PROJECT MANAGER	9/27/2022

REVISIONS	DATE

SHIRLINGTON ROAD PEDESTRIAN BRIDGE
BR02
SHIRLINGTON ROAD

LEGEND

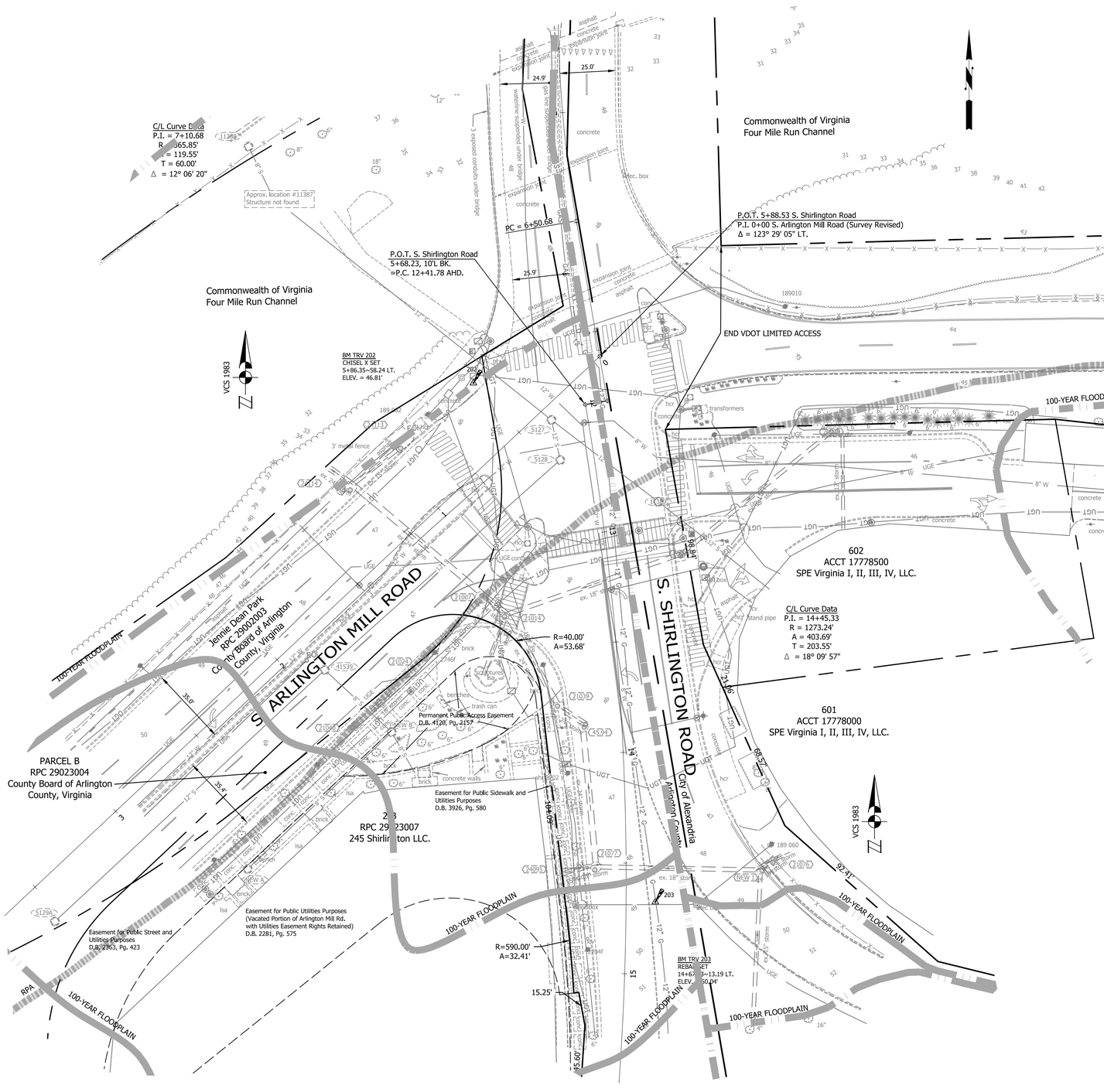
DESIGNED: BD
DRAWN: BD
CHECKED: BG

PLOTTED: JULY 13 2022

SCALE:

N/A

C006.1



SANITARY SEWER

NEW "A"
TOP = 50.82
C/L INV. = 45.33

NEW "B"
TOP = 48.34
C/L INV. = 40.09

#628
TOP = 51.07
C/L INV. = 39.87

#629
TOP = 50.29
C/L INV. = 40.29

#630
TOP = 54.62
C/L INV. = 41.78

#952
TOP = 51.22
C/L INV. = 42.42

#953
TOP = 51.42
C/L INV. = 43.08

#5127
TOP = 46.39
C/L INV. = 31.36

#5128
TOP = 46.09
C/L INV. = 31.39

#5129A
TOP = 52.15
C/L INV. = 34.69

#10215
TOP = 51.77
C/L INV. = 38.28

#11388
TOP = 46.14
C/L INV. = 33.12

#11389
TOP = 45.17
C/L INV. = 32.52

#41539
TOP = 48.04
C/L INV. = 33.22

STORM SEWER

NEW 1
TOP = 48.08
18" RCP INV. IN= 44.20 (21076)
15" RCP INV. IN= 43.97 (SOUTH)
18" RCP INV. OUT= 43.73 (21077)

#20976
TOP=45.77
8" RCP INV. IN= 42.83 (BUILDING)
15" RCP INV. OUT= 42.69 (20994)

#20981 (PIPE OUTFALL)
24" RCP INV. OUT = 38.70

#20994
TOP=45.50
15" RCP INV. IN= 42.37 (20976)
18" RCP INV. OUT= 42.34 (21014)

#21007
TOP=46.24
24" RCP INV. IN= 40.34 (21014)
18" RCP INV. IN= 40.28 (21024)
24" RCP INV. OUT= 40.24 (24114)

#21014 TOP=45.97
24" RCP INV. IN= 40.97 (21039)
15" RCP INV. IN= 41.25 (21032)
18" RCP INV. IN= 41.13 (20994)
24" RCP INV. OUT= 40.82 (21007)

#21024
TOP = 47.18
18" RCP INV. IN = 42.99 (21040)
18" RCP INV. OUT = 42.93 (21007)

#21039
TOP = 46.10
24" RCP INV. IN= 41.85 (24096)
24" RCP INV. OUT= 41.83 (21014)

#21040
TOP = 48.21
18" RCP INV. OUT = 43.55 (21024)

#21076
TOP=48.50
15" RCP INV. IN= 44.49 (POL)
18" RCP INV. OUT= 44.41 (NEW)

#21077
TOP = 47.67
15" RCP INV. IN = 43.03 (24095)
18" RCP INV. IN = 42.38 (NEW)
24" RCP INV. OUT= 42.32 (24096)

#24095
TOP = 47.93
15" RCP INV. IN = 43.55 (BUILDING)
15" RCP INV. OUT = 43.31 (21077)

#24096
TOP=45.94
24" RCP INV. IN= 42.04 (21077)
24" RCP INV. OUT= 41.96 (21039)

#24113
TOP = 46.18
15" RCP INV. OUT= 41.56 (24114)

#24114
TOP=46.83
24" RCP INV. IN= 39.23 (21007)
15" RCP INV. IN= 39.71 (24113)
24" RCP INV. OUT= 38.88 (20981)

NEW 2
TOP = 51.53
15" RCP INV. IN = 47.95 (WEST)
15" RCP INV. OUT = 47.45 (20704)

NEW 3
TOP = 50.01
24" RCP INV. IN = 38.19 (20742)
24" RCP INV. OUT = 38.12 (25511)

#20665
TOP = 50.78
24" RCP INV. OUT = 44.45 (20699)

#20699
TOP = 50.51
24" RCP INV. IN = 43.77 (20665)
15" RCP INV. IN = 45.91 (20704)
15" RCP INV. IN = 45.41 (20705)
24" RCP INV. OUT = 43.58 (20742)

#20704 TOP = 50.84
15" RCP INV. IN = 47.39 (NEW)
15" RCP INV. OUT = 46.71 (20699)

#20705
TOP = 50.68
15" RCP INV. OUT = 46.15 (20699)

#20717
TOP = 50.39
18" RCP INV. IN = 44.95 (WEST)
18" RCP INV. OUT = 44.72 (20729)

#20729
TOP = 50.07
18" RCP INV. IN = 44.31 (20717)
18" RCP INV. OUT = 41.71 (20742)

#20742
TOP = 50.52
24" RCP INV. IN = 39.07 (20699)
18" RCP INV. IN = 41.38 (20729)
24" RCP INV. OUT = 38.27 (NEW 3)

#20837
TOP = 46.77
18" RCP INV. IN = 41.34 (25517)
15" RCP INV. IN = 42.72 (25513)
15" RCP INV. IN = 40.93 (25514)
18" RCP INV. OUT = 38.10 (20838)

#20838
TOP = 47.06
24" RCP INV. IN = 37.21 (25511)
18" RCP INV. IN = 37.81 (20837)
15" RCP INV. IN = 42.73 (25512)
24" RCP INV. OUT = 37.18 (20841)

#20841
TOP = 46.92
24" RCP INV. IN = CAN'T READ (20838)
24" RCP INV. OUT = 36.81 (20885)

#20885 (PIPE OUTFALL)
24" RCP INV. OUT = 28.11

#25511
TOP = 47.73
24" RCP INV. IN = 37.60 (NEW 3)
24" RCP INV. OUT = 37.58 (20838)

#25512
TOP = 47.90
15" RCP INV. OUT = 44.57 (20838)

#25513
TOP = 46.95 (DOMED GRATE TOP)
12" RCP INV OUT = 43.77 (20837)

#25514
TOP = 46.93
15" RCP INV. OUT = 41.57 (20837)

#25517
TOP = 45.89
18" RCP INV. OUT = 42.56 (20837)

SURVEY CONTROL

PT	NORTHING	EASTING	ELEVATION	DESCRIPTION
415	6993642.9208	11885498.0078	56.68	TRV 415
700	6993493.1659	11885775.5839	50.95	TRV 700
201	6993308.14789	11885686.46761	48.00	TRV 201
202	6993150.94474	11885677.80146	46.81	TRV 202
203	6992916.4597	11885759.9601	50.04	TRV 203
204	6993153.47155	11885981.73055	44.61	TRV 204

NOTES:
1) GPS COORDINATES ESTABLISHED ON POINTS 415 AND 700 BY ARLINGTON COUNTY ON MAY 14, 2015.
2) POINTS WERE SCALED BY A FACTOR OF 1.00006 USING A BASE POINT WITH COORDINATES N7009718, E11878491.
3) POINT 700 WAS HELD FOR POSITION AND POINT 415 WAS HELD FOR LINE.
4) THE GPS ELEVATION OF POINT 700 (50.95') WAS HELD.
5) ALL OTHER CONTROL POINT COORDINATES ESTABLISHED BY CONVENTIONAL TRAVERSE AND DIFFERENTIAL LEVELLING.
6) ALL PAINTED UTILITIES LOCATED BY MAUL ON 06/05/2015 BASED ON THEIR OWN DESIGNATIONS.
7) BUILDING LOCATIONS ARE SHOWN FROM A COMBINATION OF AVAILABLE GIS RECORDS AND FIELD LOCATIONS.

GENERAL SURVEY NOTES:

1. THIS TOPOGRAPHIC SURVEY WAS COMPLETED UNDER THE DIRECT AND RESPONSIBLE CHARGE OF THE COUNTY SURVEY SECTION FROM AN ACTUAL GROUND SURVEY; THE IMAGE AND/OR ORIGINAL DATA WAS OBTAINED IN MAY AND JUNE 2015; AND THIS PLAT, MAP OR DIGITAL GEOSPATIAL DATA INCLUDING METADATA MEETS MINIMUM ACCURACY STANDARDS UNLESS OTHERWISE NOTED.
2. HORIZONTAL DATUM: VIRGINIA COORDINATE SYSTEM 1983.
3. VERTICAL DATUM: NORTH AMERICA VERTICAL DATUM 1988.
4. CONTOUR INTERVAL: 1'
5. BOUNDARY INFORMATION SHOWN HEREON WAS COMPILED FROM EXISTING LAND RECORDS AND DOES NOT REPRESENT A FIELD RUN BOUNDARY SURVEY.

ARLINGTON VIRGINIA

Approved: 10/3/2022
Subject to field inspection
LDA22115

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

SEAL

APPROVALS DATE

9/28/2022
DESIGN TEAM ENGINEER SUPERVISOR

10/13/22
CONSTRUCTION MANAGEMENT SUPERVISOR

10/5/22
WATER, SEWER, STREETS BUREAU CHIEF

Dennis M. Leach 10/5/22
TRANSPORTATION DIRECTOR

Rene Harris 9/27/2022
PROJECT MANAGER

REVISIONS DATE

SHIRLINGTON ROAD PEDESTRIAN BRIDGE
BR02
SHIRLINGTON ROAD

EXISTING CONDITIONS PLAN - 1

DESIGNED: BD
DRAWN: BD
CHECKED: BG

PLOTTED: JULY 13 2022

SCALE:

0 25 50
GRAPHIC SCALE

C011.1

SANITARY SEWER

NEW "A"
TOP = 50.82
C/L INV. = 45.33

NEW "B"
TOP = 48.34
C/L INV. = 40.09

#628
TOP = 51.07
C/L INV. = 39.87

#629
TOP = 50.29
C/L INV. = 40.29

#630
TOP = 54.62
C/L INV. = 41.78

#952
TOP = 51.22
C/L INV. = 42.42

#953
TOP = 51.42
C/L INV. = 43.08

#5127
TOP = 46.39
C/L INV. = 31.36

#5128
TOP = 46.09
C/L INV. = 31.39

#5129A
TOP = 52.15
C/L INV. = 34.69

#10215
TOP = 51.77
C/L INV. = 38.28

#11388
TOP = 46.14
C/L INV. = 33.12

#11389
TOP = 45.17
C/L INV. = 32.52

#41539
TOP = 48.04
C/L INV. = 33.22

STORM SEWER

NEW 1
TOP = 48.08
18" RCP INV. IN= 44.20 (21076)
15" RCP INV. IN= 43.97 (SOUTH)
18" RCP INV. OUT= 43.73 (21077)

#20976
TOP=45.77
8" RCP INV. IN= 42.83 (BUILDING)
15" RCP INV. OUT= 42.69 (20994)

#20981 (PIPE OUTFALL)
24" RCP INV. OUT = 38.70

#20994
TOP=45.50
15" RCP INV. IN= 42.37 (20976)
18" RCP INV. OUT= 42.34 (21014)

#21007
TOP=46.24
24" RCP INV. IN= 40.34 (21014)
18" RCP INV. IN= 40.28 (21024)
24" RCP INV. OUT= 40.24 (24114)

#21014 TOP=45.97
24" RCP INV. IN= 40.97 (21039)
15" RCP INV. IN= 41.25 (21032)
18" RCP INV. IN= 41.13 (20994)
24" RCP INV. OUT= 40.82 (21007)

#21024
TOP = 47.18
18" RCP INV. IN = 42.99 (21040)
18" RCP INV. OUT = 42.93 (21007)

#21039
TOP = 46.10
24" RCP INV. IN= 41.85 (24096)
24" RCP INV. OUT= 41.83 (21014)

#21040
TOP = 48.21
18" RCP INV. OUT = 43.55 (21024)

#21076
TOP=48.50
15" RCP INV. IN= 44.49 (POL)
18" RCP INV. OUT= 44.41 (NEW)

#21077
TOP = 47.67
15" RCP INV. IN = 43.03 (24095)
18" RCP INV. IN = 42.38 (NEW)
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#24095
TOP = 47.93
15" RCP INV. IN = 43.55 (BUILDING)
15" RCP INV. OUT = 43.31 (21077)

#24096
TOP=45.94
24" RCP INV. IN= 42.04 (21077)
24" RCP INV. OUT= 41.96 (21039)

#24113
TOP = 46.18
15" RCP INV. OUT= 41.56 (24114)

#24114
TOP=46.83
24" RCP INV. IN= 39.23 (21007)
15" RCP INV. IN= 39.71 (24113)
24" RCP INV. OUT= 38.88 (20981)

NEW 2
TOP = 51.53
15" RCP INV. IN = 47.95 (WEST)
15" RCP INV. OUT = 47.45 (20704)

NEW 3
TOP = 50.01
24" RCP INV. IN = 38.19 (20742)
24" RCP INV. OUT = 38.12 (25511)

#20665
TOP = 50.78
24" RCP INV. OUT = 44.45 (20699)

#20699
TOP = 50.51
24" RCP INV. IN = 43.77 (20665)
15" RCP INV. IN = 45.91 (20704)
15" RCP INV. IN = 45.41 (20705)
24" RCP INV. OUT = 43.58 (20742)

#20704 TOP = 50.84
15" RCP INV. IN = 47.39 (NEW)
15" RCP INV. OUT = 46.71 (20699)

#20705
TOP = 50.68
15" RCP INV. OUT = 46.15 (20699)

#20717
TOP = 50.39
18" RCP INV. IN = 44.95 (WEST)
18" RCP INV. OUT = 44.72 (20729)

#20729
TOP = 50.07
18" RCP INV. IN = 44.31 (20717)
18" RCP INV. OUT = 41.71 (20742)

#20742
TOP = 50.52
24" RCP INV. IN = 39.07 (20699)
18" RCP INV. IN = 41.38 (20729)
24" RCP INV. OUT = 38.27 (NEW 3)

#20837
TOP = 46.77
18" RCP INV. IN = 41.34 (25517)
15" RCP INV. IN = 42.72 (25513)
15" RCP INV. IN = 40.93 (25514)
18" RCP INV. OUT = 38.10 (20838)

#20838
TOP = 47.06
24" RCP INV. IN = 37.21 (25511)
18" RCP INV. IN = 37.81 (20837)
15" RCP INV. IN = 42.73 (25512)
24" RCP INV. OUT = 37.18 (20841)

#20841
TOP = 46.92
24" RCP INV. IN = CAN'T READ (20838)
24" RCP INV. OUT = 36.81 (20885)

#20885 (PIPE OUTFALL)
24" RCP INV. OUT = 28.11

#25511
TOP = 47.73
24" RCP INV. IN = 37.60 (NEW 3)
24" RCP INV. OUT = 37.58 (20838)

#25512
TOP = 47.90
15" RCP INV. OUT = 44.57 (20838)

#25513
TOP = 46.95 (DOMED GRATE TOP)
12" RCP INV OUT = 43.77 (20837)

#25514
TOP = 46.93
15" RCP INV. OUT = 41.57 (20837)

#25517
TOP = 45.89
18" RCP INV. OUT = 42.56 (20837)

SURVEY CONTROL				
PT	NORTHING	EASTING	ELEVATION	DESCRIPTION
415	6993642.9208	11885498.0078	56.68	TRV 415
700	6993493.1659	11885775.5839	50.95	TRV 700
201	6993308.14789	11885686.46761	48.00	TRV 201
202	6993150.94474	11885677.80146	46.81	TRV 202
203	6992916.4597	11885759.9601	50.04	TRV 203
204	6993153.47155	11885981.73055	44.61	TRV 204

NOTES:
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3) POINT 700 WAS HELD FOR POSITION AND POINT 415 WAS HELD FOR LINE.
4) THE GPS ELEVATION OF POINT 700 (50.95') WAS HELD.
5) ALL OTHER CONTROL POINT COORDINATES ESTABLISHED BY CONVENTIONAL TRAVERSE AND DIFFERENTIAL LEVELLING.
6) ALL PAINTED UTILITIES LOCATED BY MAUL ON 06/05/2015 BASED ON THEIR OWN DESIGNATIONS.
7) BUILDING LOCATIONS ARE SHOWN FROM A COMBINATION OF AVAILABLE GIS RECORDS AND FIELD LOCATIONS.

GENERAL SURVEY NOTES:

1. THIS TOPOGRAPHIC SURVEY WAS COMPLETED UNDER THE DIRECT AND RESPONSIBLE CHARGE OF THE COUNTY SURVEY SECTION FROM AN ACTUAL GROUND SURVEY; THE IMAGE AND/OR ORIGINAL DATA WAS OBTAINED IN MAY AND JUNE 2015; AND THIS PLAT, MAP OR DIGITAL GEOSPATIAL DATA INCLUDING METADATA MEETS MINIMUM ACCURACY STANDARDS UNLESS OTHERWISE NOTED.
2. HORIZONTAL DATUM: VIRGINIA COORDINATE SYSTEM 1983.
3. VERTICAL DATUM: NORTH AMERICA VERTICAL DATUM 1988.
4. CONTOUR INTERVAL: 1'
5. BOUNDARY INFORMATION SHOWN HEREON WAS COMPILED FROM EXISTING LAND RECORDS AND DOES NOT REPRESENT A FIELD RUN BOUNDARY SURVEY.

ARLINGTON VIRGINIA
Approved: 10/3/2022
Subject to field inspection
LDA22115

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

SEAL

APPROVALS	DATE
PESIGN TEAM ENGINEER SUPERVISOR	9/28/2022
CONSTRUCTION MANAGEMENT SUPERVISOR	10/13/22
WATER, SEWER, STREETS BUREAU CHIEF	10/5/22
TRANSPORTATION DIRECTOR Dennis M. Leach	10/5/22
PROJECT MANAGER Rene Harris	9/27/2022

REVISIONS DATE

SHIRLINGTON ROAD PEDESTRIAN BRIDGE
BR02
SHIRLINGTON ROAD
EXISTING CONDITIONS PLAN - 2

DESIGNED: BD
DRAWN: BD
CHECKED: BG

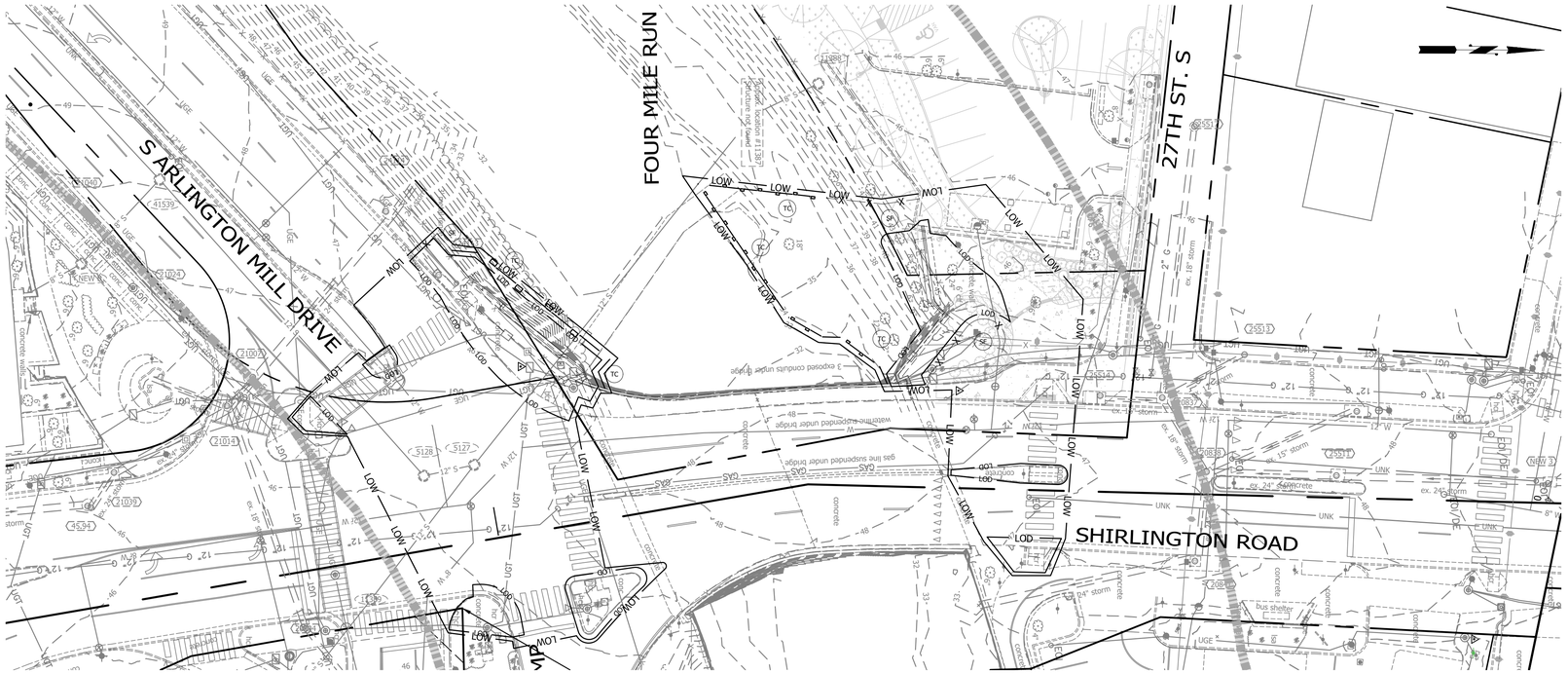
PLOTTED: JULY 13 2022

SCALE:
0 25 50
GRAPHIC SCALE

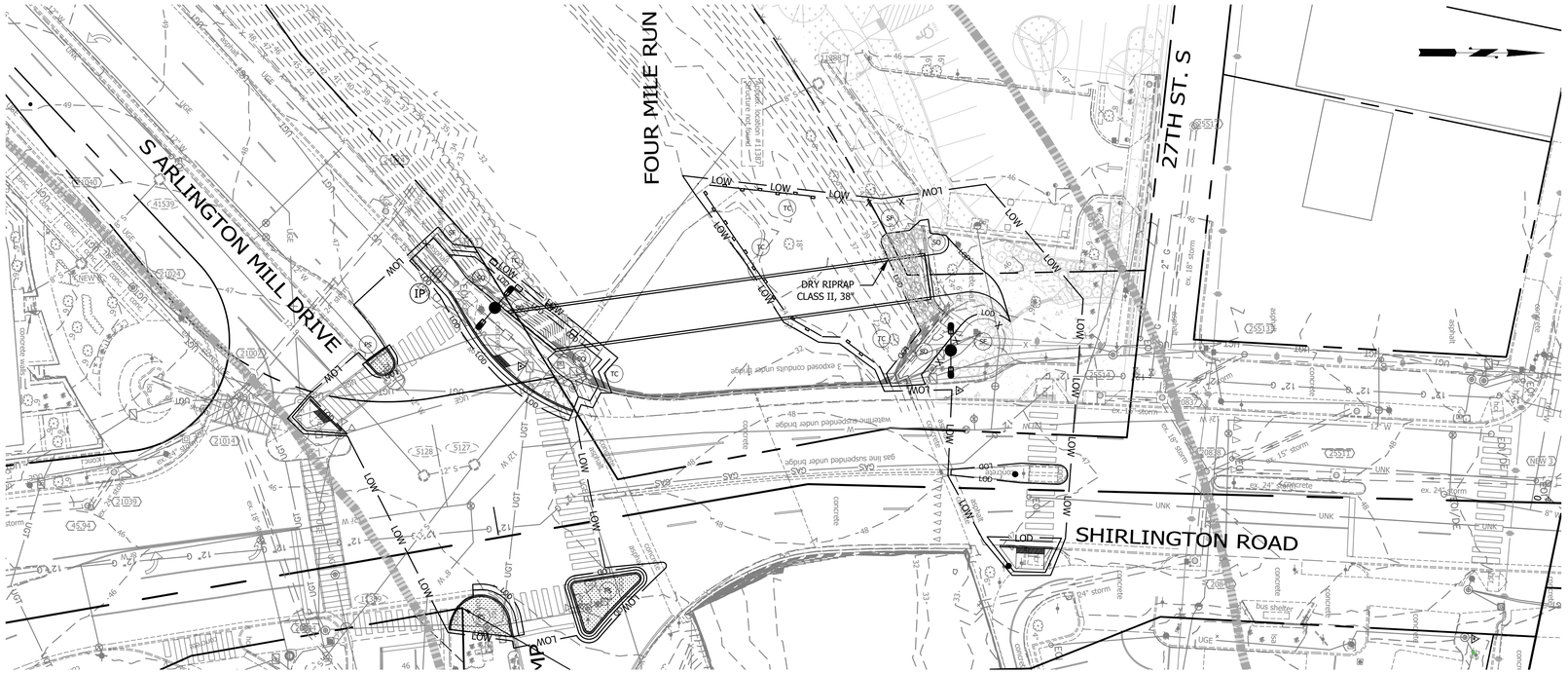
C011.2

REVISED ON 1/24/2022

FILENAME: BR02-214- EXISTING_CONDITIONS.DWG PATH: T:\1009400 - MASTER-ARLINGTON COUNTY ON-CALL\1009450 - SHIRLINGTON RD PEDESTRIAN BRIDGE\07 DESIGN\DWG PLOTTED BY: BRENDA.DJONG



EROSION & SEDIMENT CONTROL PLAN - PHASE ONE



EROSION & SEDIMENT CONTROL PLAN - PHASE TWO

EROSION AND SEDIMENT CONTROL LEGEND

3.05	TEMPORARY SILT FENCE	SF	—X—X—
3.27	TURBIDITY CURTAIN	TC	· —— ·
3.07	STORM DRAIN INLET PROTECTION	IP	
3.32	PERMANENT SEEDING	PS	
3.33	SODDING	SO	
LIMITS OF DISTURBANCE		— LOD —	
LIMITS OF WORK		— LOW —	

NOT FOR CONSTRUCTION
THIS SHEET FOR CALCULATION PURPOSES ONLY

ARLINGTON VIRGINIA

Approved: 10/3/2022
Subject to field inspection
LDA22115

ARLINGTON VIRGINIA
DEPARTMENT OF ENVIRONMENTAL SERVICES
FACILITIES & ENGINEERING DIVISION
ENGINEERING BUREAU
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ARLINGTON, VA 22201
PHONE: 703.228.3629
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SEAL

COMMONWEALTH OF VIRGINIA
ADANE M. BOBO
Lic. No. 055443
05-19-2022
PROFESSIONAL ENGINEER

APPROVALS	DATE
DESIGN TEAM ENGINEER SUPERVISOR	9/28/2022
CONSTRUCTION MANAGEMENT SUPERVISOR	10/13/22
WATER, SEWER, STREETS BUREAU CHIEF	10/5/22
TRANSPORTATION DIRECTOR Dennis M. Leach	10/5/22
PROJECT MANAGER Rene Harris	9/27/2022

REVISIONS	DATE

SHIRLINGTON ROAD PEDESTRIAN BRIDGE
BR02
SHIRLINGTON ROAD

EROSION AND SEDIMENT CONTROL PLAN

DESIGNED: BD
DRAWN: BD
CHECKED: BG

PLOTTED: JULY 13 2022

SCALE:

0 25 50
GRAPHIC SCALE

C031.1

REVISED ON 1/24/2022

FILENAME: BR02-224-E_AND_S_PLAN.DWG PATH: T:\1009400 - MASTER-ARLINGTON COUNTY ON-CALL\1009450 - SHIRLINGTON RD PEDESTRIAN BRIDGE\07 DESIGN\DWG PLOTTED BY: BRENDA.DUONG

EROSION AND SEDIMENT CONTROL NARRATIVE

PROJECT DESCRIPTION:

THE SHIRLINGTON ROAD PEDESTRIAN BRIDGE PROJECT CONSISTS OF THE CONSTRUCTION OF A PEDESTRIAN BRIDGE OVER FOUR MILE RUN ADJACENT TO THE EXISTING BRIDGE ON SHIRLINGTON ROAD LOCATED IN ARLINGTON COUNTY, VIRGINIA. THE PROPOSED PEDESTRIAN BRIDGE WILL HELP IMPROVE ACCESS BETWEEN GREEN VALLEY AND SHIRLINGTON FOR CIVILIANS WHO ARE WALKING, BIKING, AND ROLLING. THE TOTAL PROJECT WORK AREA IS 18,856 SF (0.43 AC), WITH 4,567 SF (0.11 AC) SUBJECT TO LAND DISTURBING ACTIVITY. THE IMPERVIOUS AREA WILL NOT BE INCREASED BY THE PROPOSED IMPROVEMENT.

PROJECT WORK INCLUDES:

- INSTALLING THE PROPOSED PEDESTRIAN BRIDGE
- SIDEWALK TIE-IN FROM THE EXISTING SIDWALK FROM THE JEANIE DEAN PROJECT
- REMOVING AND INSTALLING OF NEW CURB & GUTTER
- SIGNING AND PAVEMENT MARKINGS

EXISTING SITE CONDITIONS:

THE PROJECT IS LOCATED AROUND WHERE THE SHIRLINGTON ROAD CROSSES OVER THE FOUR MILE RUN. THE ROADWAY IS A PRIMARY ROAD WITH THE CLASSIFICATION OF URBAN PRINCIPAL ARTERIAL. THE SITE IS LOCATED WITH IN POTOMAC RIVER-FOUR MILE RUN SUB- WATERSHED WITH THE 8 DIGIT HYDROLOGIC UNIT CODE (HUC) OF 02070010 AND IT HAS HYDROLOGY SOIL GROUP OF MAINLY B/D. THE SOIL TYPE IS "URBAN LAND-UDORTHENTS COMPLEX," THE SITE HAVE A SLOPES BETWEEN 2% AND 15%.

ADJACENT PROPERTIES:

THERE IS A SMALL PARK ON THE NORTH WEST SIDE ALONG WITH SEVERAL COMMERCIAL INFRASTRUCTURES SURROUNDING THE PROJECT SITE. WHERE ADJACENT AREAS ARE AT A LOWER ELEVATION, SILT FENCE IS PROPOSED TO BE USED AS A PERIMETER CONTROL.

OFF-SITE AREAS:

A MINIMAL AMOUNT OF OFFSITE BORROW MAY BE REQUIRED FOR TOPSOIL IN PROJECT SITE. THE LOCATION AND ENSURING MAINTENANCE OF THE BORROW AREAS IS THE CONTRACTOR'S RESPONSIBILITY.

CRITICAL AREAS:

THERE IS DELINEATED FLOODPLAIN AND RESOURCE PROTECTION AREA WITHIN THE PROJECT LIMIT. DISTURBED AREAS SHALL BE MONITORED ROUTINELY FOR SIGNS OF EROSION, AND TEMPORARY STABILIZATION SHALL BE PUT IN PLACE AS NEEDED. PERIMETER CONTROLS, PARTICULARLY INLET PROTECTION, SHALL BE MONITORED FREQUENTLY AND CLEARED AS NEEDED. THE PROJECT AREA IS HIGHLY DEVELOPED AND WELL GRADED AND THE PROPOSED IMPROVEMENT WILL NOT INCREASE THE EXISTING IMPERVIOUS FOOT PRINT.

EROSION AND SEDIMENT CONTROL MEASURES:

THE EROSION AND SEDIMENT CONTROL MEASURES FOR THIS PROJECT AREA SHALL INCLUDE PERIMETER CONTROLS SUCH AS SILT FENCE TO PREVENT SILTY WATER FROM LEAVING THE SITE, INLET PROTECTION TO PREVENT SEDIMENT FROM ENTERING THE EXISTING STORM SEWER SYSTEM, AND STABILIZATION WITH SOD, MULCH, OR SEEDING AND STRAW OR HAY. FOR SPECIFICS REGARDING INSTALLATION, MAINTENANCE, INSPECTION, AND REMOVAL, REFER TO OTHER SECTIONS OF THIS NARRATIVE AND THE PLANS.

PERMANENT STABILIZATION:

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

STORMWATER RUNOFF CONSIDERATIONS:

THERE WILL BE A MINOR INCREASE IN IMPERVIOUS AREA TO THIS PROJECT.

TOTAL LAND DISTURBANCE......................= 4,567 SF (0.11 ACRES)
PRE-IMPROVEMENT IMPERVIOUS AREA......= 2,852 SF (0.07 ACRES)
PRE-IMPROVEMENT PERVIOUS AREA..........= 1,715 SF (0.04 ACRES)
POST-IMPROVEMENT IMPERVIOUS AREA....= 3,037 SF (0.07 ACRES)
POST-IMPROVEMENT PERVIOUS AREA..........= 1,530 SF (0.04 ACRES)
INCREASED IMPERVIOUS AREA..................= 185 SF (0.0042 ACRES)

SOILS INFORMATION:

THE FOLLOWING SOIL INFORMATION IS LISTED BELOW

SOIL#:	SOIL NAME:	HYDROLOGIC GROUP:	ERODABILITY:
12	URBAN LAND-UDORTHENTS	VARIES	N/A

FLOODPLAIN AND RESOURCE PROTECTION AREA (RPA):

THERE ARE FLOODPLAIN OR RESOURCE PROTECTION AREAS LOCATED WITHIN THIS PROJECT SITE

EROSION & SEDIMENT CONTROL PROJECT PHASING

1. **EXISTING CONDITION:**
   - a. PRE-CONSTRUCTION MEETING WITH THE PROJECT OFFICER, CONTRACTOR, AND COUNTY INSPECTOR.
   - b. INSTALL INLET PROTECTION (IP) AT STORM DRAIN INLET NEAR THE SOUTH SIDE OF THE PROPOSED BRIDGE.
   - c. PERFORM INITIAL PERIMETER CLEARING TO INSTALL REMAINDER OF PERIMETER CONTROLS SUCH AS SILT FENCE (SF) PER THE PHASE I PLAN.
   - d. SEED AND MULCH ALL EARTHEN CONTROLS.
   - e. CONTACT ARLINGTON COUNTY PROJECT OFFICER FOR A PERIMETER INSPECTION PRIOR TO CLEARING THE REMAINDER OF THE SITE IN ORDER TO OBTAIN PHASE II GRADING PERMIT.
   - f. REMOVE EXISTING VEGETATION AS REQUIRED WITHIN THE LIMITS OF WORK SHOWN IN THE PLANS. TREE REMOVAL, OTHER THAN WHAT IS SHOW IN THE PLANS, WILL NOT BE PERMITTED WITHOUT APPROVAL FROM THE URBAN FORESTER & EROSION CONTROL INSPECTOR.
2. **PROPOSED CONDITION:**
   - a. EXCAVATE, CONSTRUCT & BACKFILL PROPOSED ABUTMENTS.
   - b. SET PEDESTRIAN BRIDGE BEGIN SITE GRADING.
   - c. INLET PROTECTION (IP) SHALL BE PROVIDED AT STORM DRAIN INLETS AFTER INLET MODIFICATIONS ARE COMPLETED.
   - d. ONCE THE SITE IS BROUGHT TO NEAR FINAL GRADE, COMMENCE CONSTRUCTION OF CURB & GUTTER, SIDEWALKS, AND OTHER IMPROVEMENTS
   - e. THE CONTROL MEASURES MAY NOT BE REMOVED UNTIL ALL OF THE DISTURBED AREAS HAVE BEEN STABILIZED AND ONLY AS APPROVED AND DIRECTED BY THE INSPECTOR.

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

EROSION AND SEDIMENT CONTROL MEASURES

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

1. STRUCTURAL PRACTICES

a. SILT FENCE - VESCH 3.05

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

b. STORM DRAIN INLET PROTECTION - VESCH 3.07

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

c. TURBIDITY CURTAIN-VESCH 3.27

- c.a. TURBIDITY CURTAIN WILL BE INSTALLED WITH THE E&S PLAN TO PROVIDE SEDIMENTATION PROTECTION FOR A WATERCOURSE FROM UP-SLOPE LAND DISTURBANCE OR FROM DREDGING OR FILLING WITHIN THE WATERCOURSE.
- c.b. SHOULD REPAIRS TO THE GEOTEXTILE FABRIC BECOME NECESSARY, MANUFACTURER'S INSTRUCTIONS MUST BE FOLLOWED TO ENSURE THE ADEQUACY OF THE REPAIR.
- c.c. WHEN THE CURTAIN IS NO LONGER REQUIRED AS DETERMINED BY THE INSPECTOR, THE CURTAIN AND RELATED COMPONENTS SHALL BE REMOVED IN SUCH A MANNER AS TO MINIMIZE TURBIDITY.

2. VEGETATIVE PRACTICES

a. TOPSOILING (STOCKPILE) - VESCH 3.30

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

b. TEMPORARY SEEDING - VESCH 3.31

- b.a. ALL DENUDED AREAS, WHICH WILL BE LEFT DORMANT FOR EXTENDED PERIODS OF TIME SHALL BE SEEDED WITH FAST GERMINATING TEMPORARY VEGETATION IMMEDIATELY FOLLOWING GRADING. SELECTION OF THE SEED MIXTURE WILL DEPEND ON THE TIME OF YEAR IT IS APPLIED.
- b.b. USE TEMPORARY SEEDING SPECIFICATIONS OF THE DEQ EROSION & SEDIMENT CONTROL TECHNICAL BULLETIN NO. 4 -TABLE 3.31-B SEE FOR ALLOWABLE PLANTING MATERIAL, SEEDING RATES, AND DATES.

TABLE 3.31-B
(Revised June 2003)
TEMPORARY SEEDING SPECIFICATIONS QUICK REFERENCE FOR ALL REGIONS

SEED		
APPLICATION DATES	SPECIES	APPLICATION RATES
Sep. 1-Feb. 15	50/50 Mix oF Annual Ryegrass (lolium multi-florum) & Cereal (Winter) Rye (Secale cereale)	50-100 (lbs/acre)
Feb. 16-Apr.30	Annual Ryegrass (lolium multi-florum)	60-100 (lbs/acre)
May 1 Aug. 31	German Millet	50 (lbs/acre)
FERTILIZER & LIME		
. Apply 10-10-10 fertilizer at a rate of 450 lbs./acre (or 10 lbs/ 1,000 sq.ft.)		
. Apply Pulverized Agricultual Limestone at a rate of 2 tons/acre (or 90 lbs./ 1,000 sq. ft)		
NOTE:		
1- A soil test is necessary to detmine the actual amount of lime required to adjust the soil pH of site.		
2. Incorporate the lime and fertizer into the top 4-6 inches of the soil by disking or by other means.		
3. When applying Slowly Available Nitrogen, use rates available in Erosion & Sediment Control Technical Bulletin #4, 2003 Nutrient management for Development Sites at http://www.dcr.state.va.us/sw/e&s.htm#pubs		

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

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

d. DUST CONTROL - VESCH 3.39

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

e. PERMANENT SEEDING - VESCH 3.32

- e.a. SINCE THE SUBJECT SITE IS LOCATED WITHIN THE RESOURCE PROTECTED AREA (RPA), A NATIVE SEED MIX SPECIFIED IN THE TABLE SHOWN AT THE END OF SHEET C032.2 SHALL BE FOLLOWED FOR FINAL SEEDING MATERIAL, SEEDING RATES, AND DATES OF APPLICATION.

f. SODDING - VESCH 3.33

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

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

EROSION AND SEDIMENT CONTROL MANAGEMENT MEASURES

LANDSCAPE / TREE PRESERVATION NOTES

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

LAND CONSERVATION NOTES:

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

EROSION & SEDIMENT CONTROL PROGRAM:

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

GENERAL EROSION AND SEDIMENT CONTROL NOTES

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

PRE-STORM EROSION & SEDIMENTATION CHECKLIST:

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

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

1. PERIMETER CONTROLS
   - a. SILT FENCE SHALL BE CHECKED FOR UNDERMINING, HOLES, OR DETERIORATION OF THE FABRIC. FENCING SHALL BE REPLACED IMMEDIATELY IF THE FABRIC IS DAMAGED OR WON. SILT FENCE MUST BE TRENCHED INTO THE GROUND PER STATE SPECIFICATIONS (VESCH STD & SPEC 3.09).
   - b. WOODEN STAKES OR STEEL POSTS SHALL BE PROPERLY SECURED UPRIGHT INTO THE GROUND. DAMAGED POSTS OR STAKES MUST BE REPLACED.
   - c. SEDIMENT THAT HAS ACCUMULATED AGAINST THE SILT FENCE SHALL BE REMOVED. ACCUMULATED SEDIMENT MUST BE REMOVED WHEN THE LEVEL REACHES ONE-HALF THE HEIGHT OF THE FENCING.
   - d. HAY BALES OR A STONE BERM SHALL BE PLACED ACROSS THE CONSTRUCTION ENTRANCE TO PREVENT SEDIMENT FROM LEAVING THE CONSTRUCTION SITE.
2. EXPOSED SLOPES AND SOIL
   - a. EXPOSED SLOPES NOT AT THE FINAL STABILIZATION PHASE SHALL BE COVERED WITH TARPS, PLASTIC SHEETING, OR EROSION CONTROL MATTING. COVERING MATERIAL SHALL BE PROPERLY SECURED/ANCHORED.
   - b. CONTROLS SHALL BE INSTALLED TO PREVENT CONCENTRATED FLOW DOWN AN EXPOSED SLOPE. BERMS OR DIVERSION DIKES SHALL BE INSTALLED AT THE TOP OF CUT/EXPOSED SLOPES TO DIRECT STORM FLOW AROUND THE DISTURBED AREA.
   - c. EXPOSED SLOPES AT THE FINAL STABILIZATION PHASE SHALL BE STABILIZED USING SLOPE STABILIZATION PRACTICES SUCH AS SOIL STABILIZATION BLANKETS OR MATTING AS SPECIFIED IN THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK (VESCH STD & SPEC 3.36). BLANKETS OR MATS MUST BE PROPERLY SECURED AND ANCHORED TO THE SLOPE USING STAPLES, PINS, OR STAKES.
   - d. SEEDED AREAS SHALL BE CHECKED AND RESEEDED AS NECESSARY TO COVER EXPOSED SOIL. RECENTLY SEEDED AREAS SHALL BE PROTECTED BY STRAW OR SOIL STABILIZATION BLANKETS TO PREVENT SEEDING FROM BEING WASHED AWAY.
3. STOCKPILES
   - a. STOCKPILED SOIL AND OTHER LOOSE MATERIALS THAT CAN BE WASHED AWAY SHALL BE COVERED WITH A TARP, PLASTIC SHEETING, OR OTHER STABILIZATION MATTING. THE COVER MUST BE PROPERLY SECURED/ANCHORED DOWN TO PREVENT IT FROM BEING BLOWN OFF AND EXPOSING MATERIALS TO RAIN. CONTROLS SUCH AS HAY BALES OR BOOMS SHALL BE PLACED ALONG THE PERIMETER OF THE STOCKPILE (DOWNHILL SIDE).
4. INLET PROTECTION
   - a. INLET PROTECTION CONTROLS SHALL BE INSPECTED TO ENSURE THEY ARE FUNCTIONING PROPERLY AND FLOODING WILL NOT OCCUR. CLOGGED OR DAMAGED CONTROLS MUST BE REPLACED IMMEDIATELY. ENSURE CONTROLS ALLOW FOR OVERFLOW/BYPASS OF STORMWATER RUNOFF DURING SIGNIFICANT STORM EVENTS.

IN ADDITION TO THESE PRE-STORM ACTIONS, ALL EROSION AND SEDIMENT CONTROL (ESC) MEASURES MUST BE CHECKED DAILY AND AFTER EACH SIGNIFICANT RAINFALL.

POLLUTION PREVENTION PLAN NOTES (STORMWATER MANUAL - SECTION 2.4)

1. ONLY THE FOLLOWING NON-STORMWATER DISCHARGES ARE AUTHORIZED BY ARLINGTON COUNTY'S MS4 PERMIT, UNLESS THE STATE WATER CONTROL BOARD, THE VIRGINIA SOIL AND WATER CONSERVATION BOARD (BOARD), OR ARLINGTON COUNTY DETERMINES THE DISCHARGE TO BE A SIGNIFICANT SOURCE OF POLLUTANTS TO SURFACE WATERS:
   - a. WATER LINE FLUSHING; LANDSCAPE IRRIGATION; DIVERTED STREAM FLOWS; RISING GROUND WATERS; UNCONTAMINATED GROUND WATER INFILTRATION (AS DEFINED AT 40 CFR 35.2005(20)); UNCONTAMINATED PUMPED GROUND WATER; DISCHARGES FROM POTABLE WATER SOURCES; FOUNDATION DRAINS; AIR CONDITIONING CONDENSATION; IRRIGATION WATER; SPRINGS; WATER FROM CRAWL SPACE PUMPS; FOOTING DRAINS; LAWN WATERING; INDIVIDUAL RESIDENTIAL CAR WASHING; FLOWS FROM RIPARIAN HABITATS AND WETLANDS; DECHLORINATED SWIMMING POOL DISCHARGES; DISCHARGES OR FLOWS FROM FIREFIGHTING; AND, OTHER ACTIVITIES GENERATING DISCHARGES IDENTIFIED BY THE DEPARTMENT OF ENVIRONMENTAL QUALITY AS NOT REQUIRING VPDES AUTHORIZATION.
2. APPROPRIATE CONTROLS MUST BE IMPLEMENTED TO PREVENT ANY NON-STORMWATER DISCHARGES NOT INCLUDED ON THE ABOVE LIST (E.G., CONCRETE WASH WATER, PAINT WASH WATER, VEHICLE WASH WATER, DETERGENT WASH WATER, ETC.) FROM BEING DISCHARGED INTO ARLINGTON COUNTY'S MS4 SYSTEM, WHICH INCLUDES THE CURB AND GUTTER SYSTEM, AS WELL AS CATCH BASINS AND OTHER STORM DRAIN INLETS, OR STREAM NETWORK.
3. PER CHAPTER 26 OF THE ARLINGTON COUNTY CODE, IT SHALL BE UNLAWFUL FOR ANY PERSON TO DISCHARGE DIRECTLY OR INDIRECTLY INTO THE STORM SEWER SYSTEM OR STATE WATERS, ANY SUBSTANCE LIKELY, IN THE OPINION OF THE COUNTY MANAGER, TO HAVE AN ADVERSE EFFECT ON THE STORM SEWER SYSTEM OR STATE WATERS.

UTILITY INSTALLATION:

UNDERGROUND UTILITY LINES SHALL BE INSTALLED IN ACCORDANCE WITH THE FOLLOWING STANDARDS IN ADDITION TO OTHER APPLICABLE CRITERIA:

1. NO MORE THAN 100 LINEAR FEET OF TRENCH MAY BE OPENED AT ONE TIME.
2. EXCAVATED MATERIAL SHALL BE PLACED ON THE UPHILL SIDE OF TRENCHES.
3. EFFLUENT FROM DEWATERING OPERATIONS SHALL BE FILTERED OR PASSED THROUGH AN APPROVED SEDIMENT TRAPPING DEVICE, OR BOTH, AND DISCHARGED IN A MANNER THAT DOES NOT ADVERSELY AFFECT FLOWING STREAMS OR OFF-SITE PROPERTY.
4. MATERIAL USED FOR BACKFILLING TRENCHES SHALL BE PROPERLY COMPACTED IN ORDER TO MINIMIZE EROSION AND PROMOTE STABILIZATION.
5. STABILIZATION SHALL BE ACCOMPLISHED IN ACCORDANCE WITH THESE REGULATIONS.
6. APPLICABLE SAFETY REGULATIONS SHALL BE COMPLIED WITH.
9. ANY DISTURBED AREA NOT COVERED BY NOTE #1 ABOVE AND PAVED, SODDED OR BUILT UPON BY NOVEMBER 1ST, OR DISTURBED AFTER THAT DATE, SHALL BE MULCHED WITH HAY OR STRAW AT THE RATE OF 2 TONS PER ACRE AND OVER-SEEDED NO LATER THAN MAY 15TH.
10. AT THE COMPLETION OF THE CONSTRUCTION PROJECT AND PRIOR TO BOND RELEASE, ALL TEMPORARY SEDIMENT CONTROLS SHALL BE REMOVED AND ALL DENUDED AREAS SHALL BE STABILIZED. ARLINGTON COUNTY INSPECTOR TO APPROVE REMOVAL OF ALL TEMPORARY SILTATION MEASURES.

MAINTENANCE PROGRAM:

THE FOLLOWING IS A PROGRAM OF MAINTENANCE FOR THE MECHANICAL CONTROLS SPECIFIED IN THIS NARRATIVE AND ON THE PLAN:

1. THE SITE SUPERINTENDENT OR HIS/HER REPRESENTATIVE SHALL MAKE A VISUAL INSPECTION OF ALL MECHANICAL CONTROLS AND NEWLY STABILIZED AREA (I.E. SEEDED AND MULCHED AND/OR SODDED AREAS) ON A DAILY BASIS; ESPECIALLY AFTER A HEAVY RAINFALL EVENT TO ENSURE THAT ALL CONTROLS ARE MAINTAINED AND PROPERLY FUNCTIONING. ANY DAMAGED CONTROLS SHALL BE REPAIRED PRIOR TO THE END OF THE WORK DAY INCLUDING RE-SEEDING AND MULCHING OR RE-SODDING IF NECESSARY.
2. ALL SEDIMENT TRAPPING DEVICES SHALL BE CLEARED OUT AT 50% TRAP CAPACITY AND THE SEDIMENT SHALL BE DISPOSED OF BY SPREADING ON THE SITE OR IF NOT SUITABLE FOR FILL, HAULING AWAY AND DEPOSITING AT AN ACCEPTABLE DUMP SITE.
3. THE CONTRACTOR SHALL TAKE SPECIAL CARE TO PREVENT MUD AND/OR OTHER DEBRIS FROM BEING ENTERED ONTO EXISTING SWM/BMP FACILITIES OR DOWNSTREAM WATER WAYS. SHOULD OFF-SITE AREAS BECOME POLLUTED BY CONSTRUCTION ACTIVITIES, THE CONTRACTOR SHALL BE RESPONSIBLE FOR CLEANING THE AFFECTED AREAS TO THE SATISFACTION OF THE INSPECTOR.
4. AT THE COMPLETION OF CONSTRUCTION AND PRIOR TO BOND RELEASE, ALL TEMPORARY SEDIMENT CONTROLS SHALL BE REMOVED AND ANY REMAINING DENUDED AREAS SHALL BE STABILIZED. CERTAIN DEVICES MAY BE REMOVED PRIOR TO CONSTRUCTION COMPLETION BUT ONLY WITH THE APPROVAL OF THE COUNTY INSPECTOR.
5. AFTER CONSTRUCTION OPERATIONS HAVE ENDED, ALL DISTURBED AREAS SHALL BE STABILIZED. UPON APPROVAL OF THE COUNTY INSPECTOR, MECHANICAL SEDIMENT CONTROLS SHALL BE REMOVED AND THE GROUND PERMANENTLY STABILIZED WITH VEGETATION WITHIN 30 DAYS.

NOT FOR CONSTRUCTION
THIS SHEET FOR CALCULATION PURPOSES ONLY

ARLINGTON
VIRGINIA

Approved: 10/3/2022
Subject to field inspection
LDA22115

ARLINGTON
VIRGINIA

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

SEAL

ADAME M. BOBO
Lic. No. 055443
05-19-2022

APPROVALS	DATE
DESIGN TEAM ENGINEER SUPERVISOR	9/28/2022
CONSTRUCTION MANAGEMENT SUPERVISOR	10/13/22
WATER, SEWER, STREETS BUREAU CHIEF	10/5/22
Dennis M. Leach TRANSPORTATION DIRECTOR	10/5/22
Rene' Harris PROJECT MANAGER	9/27/2022

REVISIONS	DATE

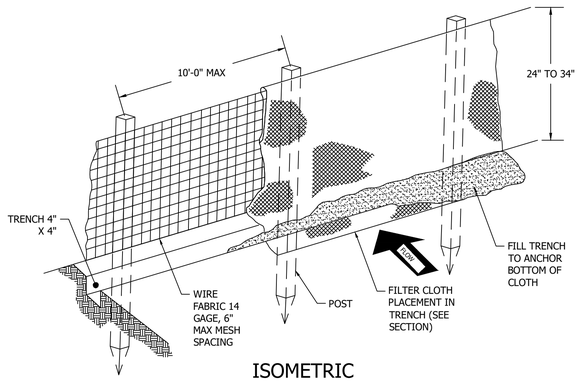
SHIRLINGTON ROAD PEDESTRIAN BRIDGE
BR02
SHIRLINGTON ROAD
EROSION AND SEDIMENT CONTROL NOTES

DESIGNED: BD
DRAWN: BD
CHECKED: BG

PLOTTED: AUGUST 30 2022

SCALE:
N/A

C032.1



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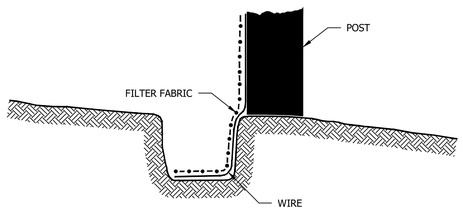


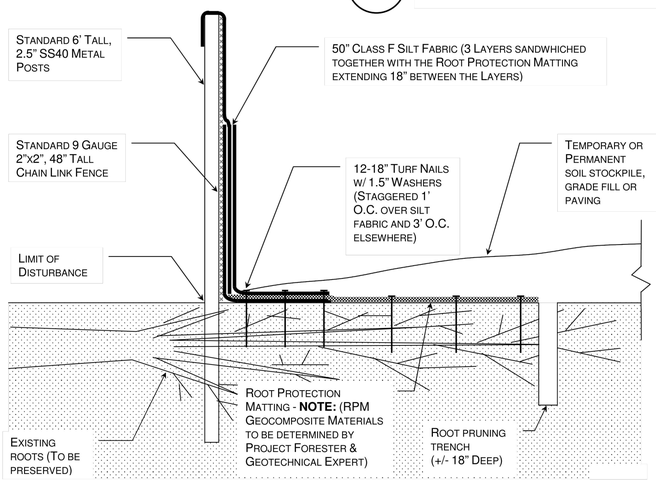
SECTION

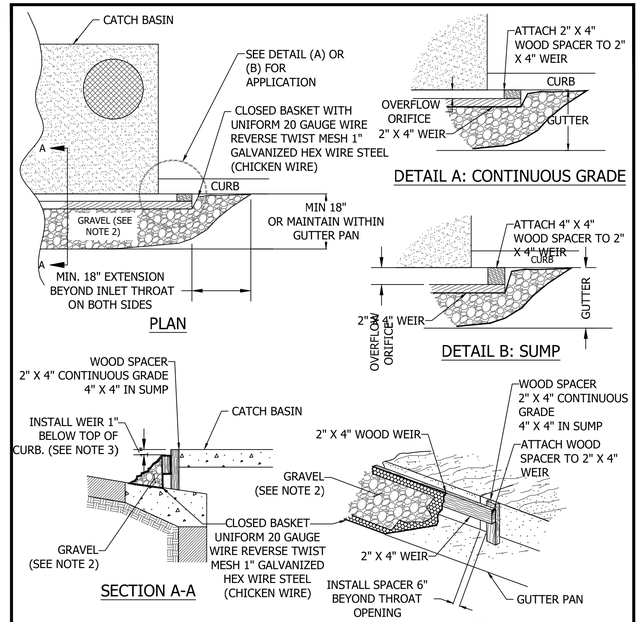
MODIFIED-VESCH 3.05

SILT FENCE NOT TO SCALE

TRENCHLESS SUPER SILT FENCE

SECTION NOT-TO-SCALE





NOTES

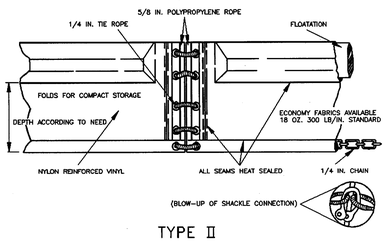
1. DIMENSIONAL LUMBER SIZES SHOW.
2. GRAVEL SHALL BE VDOT COARSE AGGREGATE #3, # 357 OR #5.
3. WEIR HEIGHT MAY BE ADJUSTED BY PROJECT OFFICER OR INSPECTOR IN FLOOD PRONE AREAS.
4. PAINT 2"X4" WEIR, CLOSED BASKET, AND GUTTER WITH HIGH VISIBILITY INCANDESCENT ORANGE PAINT.
5. REMOVE SEDIMENT AFTER EACH RAIN EVENT TO MAINTAIN FUNCTION AND AVOID PREMATURE CLOGGING. IF INLET PROTECTION DOES NOT COMPLETELY DRAIN WITHIN 24 HOURS AFTER A STORM EVENT, IT IS CLOGGED. WHEN THIS OCCURS, REMOVE ACCUMULATED SEDIMENT AND CLEAN, OR REPLACE THE PROTECTION.

CURB INLET PROTECTION	REVISION & DATE
ARLINGTON COUNTY, VIRGINIA DEPARTMENT OF ENVIRONMENTAL SERVICES	DRAWING NO. 3.07-7 (ACG)

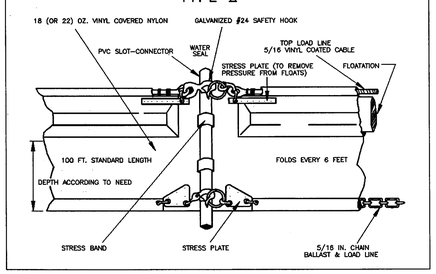
1992 3.27

TURBIDITY CURTAIN

TYPE I



TYPE II

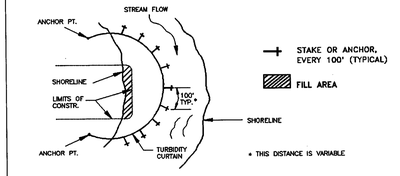


Source: American Boom and Barrier Corp. product literature Plate 3.27-1

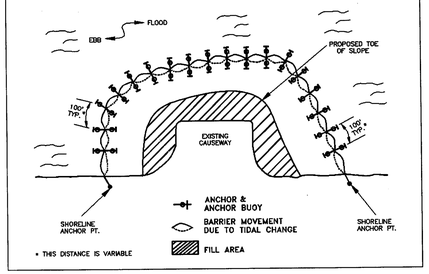
1992 3.27

TURBIDITY CURTAIN

TYPICAL LAYOUTS:
STREAMS, PONDS & LAKES (PROTECTED & NON-TIDAL)



TIDAL WATERS AND/OR HEAVY WIND & WAVE ACTION



Source: Adapted from Florida Department of Transportation Road and Design Specifications Plate 3.27-3

ARLINGTON COUNTY - RESOURCE PROTECTION AREA NATIVE SEED MIX:

Percent of Mix (%)	Latin Name	Common Name
20	*Lalium multiflorum*	Annual rye
30	*Elymus virginicus*	Virginia wild rye
25	*Panicum clandestinum*	Deer-tongue grass
15	*Elymus riparius*	Riverbank wild rye
5	*Elymus hystrix*	Bottlebrush grass
2	*Chamaecrista fasciculata*	Partridge pea
1	*Solidago rugosa*	Rough-stemmed goldenrod
1	*Asclepias syriaca*	Common milkweed
1	*Euthamia graminifolia*	Grass-leaved goldenrod

Apply at 50 lbs/acre (2 lb/1000 sf) between August 15th and May 15th.

NOT FOR CONSTRUCTION
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ARLINGTON VIRGINIA
Approved: 10/3/2022
Subject to field inspection
LDA22115
ARLINGTON VIRGINIA
DEPARTMENT OF ENVIRONMENTAL SERVICES
FACILITIES & ENGINEERING DIVISION
ENGINEERING BUREAU
2100 CLARENDON BOULEVARD, SUITE 813
ARLINGTON, VA 22201
PHONE: 703.228.3629
FAX: 703.228.3606

SEAL

COMMONWEALTH OF VIRGINIA
ADANE M. BOBO
Lic. No. 055443
05-19-2022
PROFESSIONAL ENGINEER

APPROVALS	DATE
DESIGN TEAM ENGINEER SUPERVISOR	9/28/2022
CONSTRUCTION MANAGEMENT SUPERVISOR	10/13/22
WATER/SEWER, STREETS BUREAU CHIEF	10/5/22
TRANSPORTATION DIRECTOR	10/5/22
PROJECT MANAGER	9/27/2022

REVISIONS	DATE

SHIRLINGTON ROAD PEDESTRIAN BRIDGE
BR02
SHIRLINGTON ROAD

EROSION AND SEDIMENT CONTROL
NOTES & DETAILS

DESIGNED: BD
DRAWN: BD
CHECKED: BG

PLOTTED: AUGUST 30 2022

SCALE:

N/A

C032.2

STORMWATER POLLUTION PREVENTION PLAN (SWPPP) COVER PAGE

For Construction Activities At:

BR02 – Shirlington Road Pedestrian Bridge
From Shirlington Road to South Arlington Mill Drive
Arlington, VA 22202

Latitude: 38.8433 N (decimal degrees)

Longitude: -77.0855 W (decimal degrees)

Construction Activity Operator:

Insert Company/Organization Name
Insert Name
Insert Address
Insert City, State, Zip Code
Insert Telephone Number
Insert Email Address
Insert 24-hour Emergency Contact

SWPPP Preparation Date:

January 21, 2022

CERTIFICATION

"I certify under penalty of law that I have read and understand this document and that this document and all attachments were prepared in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Operator Name: _____

Title: _____

Signature: _____

Date: _____

1.0 SWPPP Documents Located Onsite & Available for Review

SWPPP Document Type	Located Onsite & Available for Review?	
Registration Statement	☒ Yes	☐ NA
Notice of Coverage Letter	☒ Yes	☐ NA
Construction General Permit	☒ Yes	☐ NA
Pollution Prevention Plan	☒ Yes	☐ NA
Erosion & Sediment Control Plan (or agreement in lieu of)	☒ Yes	☐ NA
Stormwater Management Plan	☒ Yes	☐ NA

2.0 Authorized Non-Stormwater Discharges

Type of Authorized Non-Stormwater Discharge	Likely Present at Your Project Site?	
External buildings wash down	☐ Yes	☒ No
Uncontaminated foundation or footing drains	☒ Yes	☐ No
Uncontaminated excavation dewatering	☐ Yes	☒ No
Landscape irrigation	☐ Yes	☒ No
Others [describe]	☐ Yes	☐ No

3.0 Pollution Prevention Awareness

Employees will be given a "walk through" of the site identifying areas of possible pollution and will be shown Erosion and Sediment Controls and Pollution Prevention Practices (identified in Sections 4.0 and 5.0 of this SWPPP) that are applicable to their assigned job duties. A refresher meeting and "walk through" will be conducted on an as needed basis.

4.0 Erosion & Sediment Controls

Select all that apply	Erosion & Sediment Control	Estimated Installation Date	Estimated Removal Date	Responsible Party
☒	Construction Entrance (Std. & Spec. 3.02)			Construction Activity Operator (See Cover Page of this SWPPP)
☒	Silt Fence (Std. & Spec. 3.05)			
☐	Culvert Inlet Protection (Std. & Spec. 3.08)			
☐	Outlet Protection (Std. & Spec. 3.18)		NA	
☒	Temporary Seeding (Std. & Spec. 3.31)	As required by 3.31	NA	
☒	Permanent Seeding (Std. & Spec. 3.32)		NA	
☐	Sodding (Std. & Spec. 3.33)		NA	
☐	Mulching (Std. & Spec. 3.35)		NA	
☐	Safety Fence (Std. & Spec 3.01)			

☒	Storm Drain Inlet Protection (Std. & Spec 3.08)			
☐	Dewatering (Std. & Spec 3.26)			
☐	Turbidity Curtain (Std. & Spec 3.27)			
☐	Tree Protection (Arlington County Std. & Spec.)			
☐	Others [describe]			

5.0 Potential Sources of Pollution & Pollution Prevention Practices

Pollutant-Generating Activity	Likely Present at your Project Site?	Pollutants: Sediment	Nutrients	Heavy Metals	pH (acids and bases)	Pesticides & Herbicides	Oil & Grease	Bacteria & Viruses	Trash, Debris, Solids	Other Toxic Chemicals	Pollution Prevention Practice	Responsible Party
Clearing, grading, excavating, and un-stabilized areas	☒ Yes ☐ No	X							X		(1)	Construction Activity Operator (See Cover Page of this SWPPP)
Paving operations	☒ Yes ☐ No	X					X		X		(2)	
Concrete washout and cement waste	☒ Yes ☐ No			X	X				X		(3)	
Structure construction, stucco, painting, and cleaning	☒ Yes ☐ No			X	X				X	X	(4)	
Dewatering operations	☐ Yes ☒ No	X	X						X		(5)	
Material delivery and storage	☒ Yes ☐ No	X	X	X	X		X		X	X	(6)	
Material use during building process	☒ Yes ☐ No		X	X	X		X		X	X	(7)	
Solid waste disposal	☒ Yes ☐ No								X	X	(8)	
Sanitary waste	☒ Yes ☐ No		X		X			X			(9)	
Landscaping operations	☒ Yes ☐ No	X	X			X			X	X	(10)	
Others [describe]	☐ Yes ☐ No	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	[X]	(11)	

Pollution Prevention Practices:

(1) **Clearing, grading, excavating and un-stabilized areas** – Utilize erosion and sediment controls to prevent sediment laden or turbid runoff from leaving the construction site. Dispose of clearing debris at acceptable disposal sites. Apply permanent or temporary stabilization, sodding and/or mulching to denuded areas in accordance with the erosion and sediment control specifications and the general VPDES permit for discharges of stormwater from construction activities.

(2) **Paving operations** – Cover storm drain inlets during paving operations and utilize pollution prevention materials such as drip pans and absorbent/oil dry for all paving machines to limit leaks and spills of paving materials and fluids.

(3) **Concrete washout and cement waste** – Direct concrete wash water into a leak-proof container or leak-proof settling basin that is designed so that no overflows can occur due to inadequate sizing or precipitation. Hardened concrete wastes shall be removed and disposed of in a manner consistent with the handling of other construction wastes.

(4) **Structure construction, stucco, painting and cleaning** – Enclose, cover or berm building material storage areas if susceptible to contaminated stormwater runoff. Conduct painting operations consistent with local air quality and OSHA regulations. Mix paint indoors, in a containment area or in a flat unpaved area. Prevent the discharge of soaps, solvents, detergents and wash water from construction materials, including the clean-up of stucco paint, form release oils and curing compounds.

(5) **Dewatering operations** – Construction site dewatering from building footings or other sources may not be discharged without treatment. Sediment laden or turbid water shall be filtered, settled or similarly treated prior to discharge.

(6) **Material delivery and storage** – Designate areas of the construction site for material delivery and storage. Place near construction entrances, away from waterways, and avoid transport near drainage paths or waterways.

(7) **Material use during building process** – Use materials only where and when needed to complete the construction activity. Follow manufacturer's instructions regarding uses, protective equipment, ventilation, flammability and mixing of chemicals.

(8) **Solid waste disposal** – Designate a waste collection area on the construction site that does not receive a substantial amount of runoff from uplanc areas and does not drain directly to a waterway. Ensure that containers have lids so they can be covered before periods of rain, and keep containers in a covered area whenever possible. Schedule waste collection to prevent the containers from overfilling.

(9) **Sanitary waste** – Prevent the discharge of sanitary waste by providing convenient and well-maintained portable sanitary facilities. Locate sanitary facilities in a convenient location away from waterways.

(10) **Landscaping operations** – Maintain as much existing vegetation as practicable. Apply permanent or temporary stabilization, sodding and/or mulching to denuded areas in accordance with the erosion and sediment control specifications and the general VPDES permit for discharges of stormwater from construction activities. Apply nutrients in accordance with manufacturer's recommendations and not during rainfall events.

(11) **Others** – If applicable, describe your Pollution Prevention Practice.

6.0 Stormwater Management Controls

Select all that apply	Stormwater Management Control	Estimated Installation Date	Responsible Party
☐	Post-development Stormwater Management Controls provided by a Larger Common Plan of Development or Sale	NA	Common Plan Construction Activity Operator
☐	Rooftop Disconnection		Construction Activity Operator (See Cover Page of this SWPPP)
☐	Sheet flow to Vegetated Filter (1 or 2)		
☐	Grass Channel		
☐	Rainwater Harvesting		
☐	Permeable Pavement (1 or 2)		

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ARLINGTON VIRGINIA

Approved: 10/3/2022
Subject to field inspection
LDA22115

ARLINGTON VIRGINIA
DEPARTMENT OF ENVIRONMENTAL SERVICES
FACILITIES & ENGINEERING DIVISION
ENGINEERING BUREAU
2100 CLARENDON BOULEVARD, SUITE 813
ARLINGTON, VA 22201
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SEAL

COMMONWEALTH OF VIRGINIA
ADAM M. BOBO
Lic. No. 055443
05-19-2022
PROFESSIONAL ENGINEER

APPROVALS	DATE
DESIGN TEAM ENGINEER SUPERVISOR	9/28/2022
CONSTRUCTION MANAGEMENT SUPERVISOR	10/13/22
WATER/SEWER, STREETS BUREAU CHIEF	10/5/22
TRANSPORTATION DIRECTOR	10/5/22
PROJECT MANAGER	9/27/2022

REVISIONS	DATE

SHIRLINGTON ROAD PEDESTRIAN BRIDGE
BR02
SHIRLINGTON ROAD

STORMWATER POLLUTION PREVENTION PLAN - 1

DESIGNED: BD
DRAWN: BD
CHECKED: BG

PLOTTED: JULY 13 2022

SCALE:

N/A

C035.1

REVISED ON 1/24/2022

FILENAME: BR02-224-E_AND_S_PLAN.DWG PATH: T:\1009400 - MASTER-ARLINGTON COUNTY ON-CALL\1009450 - SHIRLINGTON RD PEDESTRIAN BRIDGE\07 DESIGN\DWG PLOTTED BY:: BRENDA.DUONG

Best Management Practices (BMPs)	In Compliance with SWPPP?	Corrective Action Needed; Responsible Party & Notes	Date Corrective Action Taken
Are all slopes and disturbed areas not actively being worked properly stabilized?	☐ Yes ☐ No ☐ NA		
Are washout facilities (e.g., concrete, paint, stucco) available, clearly marked and maintained?	☐ Yes ☐ No ☐ NA		
Is trash/litter from work areas collected and contained in dumpsters?	☐ Yes ☐ No ☐ NA		
Are non-stormwater discharges (e.g., wash water, dewatering) properly controlled?	☐ Yes ☐ No ☐ NA		
Are natural resources (e.g., streams, wetlands, mature trees) area protected with barriers or similar BMPs?	☐ Yes ☐ No ☐ NA		
Are vehicle and equipment fueling, cleaning and maintenance areas free of spills, leaks, or other deleterious material?	☐ Yes ☐ No ☐ NA		
Are materials that are potential stormwater contaminants stored inside or under cover?	☐ Yes ☐ No ☐ NA		
Are disturbed areas stabilized within 7 days, if areas denuded will remain undisturbed for 14 days?	☐ Yes ☐ No ☐ NA		

Non – Compliance
Describe any incidents of non-compliance not described above (use another page is necessary)

Certification

"I certify under penalty of law that I have read and understand this document and that this document and all attachments were prepared in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Operator or Assigned Qualified Personnel Name: _____

Signature: _____

Date: _____

Select all that apply	Stormwater Management Control	Estimated Installation Date	Responsible Party
☐	Infiltration (1 or 2)		Construction Activity Operator (See Cover Page of this SWPPP)
☐	Bioretention (1 or 2)		
☐	Others [describe]		
☐	Exempted	NA	NA

7.0 Spill Prevention & Response

Most spills can be cleaned up following manufacturer specifications. Absorbent/oil dry, sealable containers, plastic bags, and shovels/brooms are suggested minimum spill response items that should be available at this location.

1st Priority: Protect all people
2nd Priority: Protect equipment and property
3rd Priority: Protect the environment

1. Check for hazards (flammable material, noxious fumes, cause of spill) – if flammable liquid, turn off engines and nearby electrical equipment. If serious hazards are present leave the area and call 911. LARGE SPILLS ARE LIKELY TO PRESENT A HAZARD.
2. Make Sure the spill area is safe to enter and that it does not pose an immediate threat to health or safety of any person.
3. Stop the spill source.
4. Call co-workers and supervisor for assistance and to make them aware of the spill and potential dangers.
5. If possible, stop spill from entering drains (use absorbent or other material as necessary).
6. Stop spill from spreading (use absorbent or other material)
7. If spilled material has entered a storm sewer; contact locality's storm water department.
8. Clean up spilled material according to manufacturer specifications, for liquid spills use absorbent materials and do not flush area with water.
9. Properly dispose of cleaning materials and used absorbent material according to manufacturer specifications.

Emergency Contacts:

Normal Working Hours

DEQ Northern Regional Office 703-583-3800

Nights, Holidays & Weekends

VA Dept. of Emergency Management 804-674-2400
24 Hour Reporting Service

Local Contacts

Arlington County Fire & Police 703-558-2222
DES Water, Sewer, Streets 24-Hour Emergency 703-228-6555
Washington Gas Emergency 703-750-1400

8.0 Self Inspections Report & Corrective Action Log (make additional copies as necessary)

Qualified Inspector

Company/Organization:
Name:
Telephone Number:
Qualifications:

Inspection Schedule

Discharges to impaired waters, surface waters within a TMDL watershed, or exceptional waters:

☐ Once every 4 business days.

Inspection Date:

Type of Inspection: ☐ Regular ☐ Pre-storm event ☐ During storm event ☐ Post-storm event

Phase of construction: ☐ Pre-Con ☐ DEMO ☐ Clearing ☐ Building ☐ Grading ☐ Final Stabilization

Is a copy of the SWPPP available on site? ☐ Yes ☐ No Is the SWPPP complete? ☐ Yes ☐ No

Are there any discharges at the time of this inspection? ☐ Yes ☐ No If yes, describe:

Have any discharge occurred since the last inspection? ☐ Yes ☐ No If yes, describe:

Best Management Practices (BMPs)	In Compliance with SWPPP?	Corrective Action Needed; Responsible Party & Notes	Date Corrective Action Taken
Are all construction exits preventing sediment from being tracked onto the adjacent streets?	☐ Yes ☐ No ☐ NA		
Are perimeter controls and sediment barriers adequately installed and maintained?	☐ Yes ☐ No ☐ NA		
Are storm drain inlets properly protected? (on-site and adjacent)	☐ Yes ☐ No ☐ NA		
Are discharge points and receiving waters free of any sediment deposits?	☐ Yes ☐ No ☐ NA		

9.0 Grading & Stabilization Activities Log

Date Grading Activity Initiated	Description of the Grading Activity (including location)	Date Grading Activity Ceased	Date Stabilization Measures Initiated	Description of the Stabilization Measure (including location)

10.0 SWPPP Modification & Update Log

Modification Date	Description of the Modification / Update (name & title that request the modification)	Modification Prepared By (name & title)

INSTRUCTIONS for COMPLETING the
SINGLE FAMILY RESIDENCE, COMMON PLAN of DEVELOPMENT or SALE
STORMWATER POLLUTION PREVENTION PLAN (SWPPP)

General
A Stormwater Pollution Prevention Plan (SWPPP) must be developed prior to obtaining locality (e.g., City, County, Town) authorization to commence land disturbance.

SWPPP Cover Page
For a construction activity, enter the project/site name and physical address (if available), including city (or town), state and zip code. Enter the latitude and longitude in decimal degrees of the construction activity.

Enter the Construction Activity Operator's company/organization name, the Operator's name and mailing address, including city (or town), state, and zip code, telephone number, email address (if available), and a 24-hour emergency contact.

Enter the SWPPP preparation date.

The Construction Activity Operator identified on the cover page of the SWPPP is responsible for certifying the information contained therein. Please sign the certification in INK. Please note that state statues require the SWPPP to be signed as follows:
(1) For a corporation: by a responsible corporate officer;
(2) For a partnership or sole proprietorship: by a general partner or the proprietor, respectively;
(3) For a municipality, state, federal, or other public agency: by either a principal executive officer or ranking elected official.

Section 1.0 SWPPP Documents Located Onsite & Available for Review
Utilize the provided checklist to ensure that the required SWPPP documents are located onsite and are available for review, if applicable.

Section 2.0 Authorized Non-Stormwater Discharges
Identify the authorized non-stormwater discharges likely to be present at the project site. If an unlisted authorized non-stormwater discharge is likely to be present at the project site, provide it here.

Section 3.0 Pollution Prevention Awareness
Provide employees with a "walk through" of the project site and identify areas of possible pollution, erosion and sediment controls, and pollution prevention practices which are applicable to their assigned job duties. Conduct refresher meetings and perform additional "walk throughs" on an as needed basis.

Section 4.0 Erosion & Sediment Controls
Identify the erosion and sediment controls to be implemented at the project site. For each erosion and sediment control, enter the estimated installation date and estimated removal date. If an unlisted erosion and sediment control will be implemented at the project site, provide the applicable information here.

Section 5.0 Potential Sources of Pollution & Pollution Prevention Practices
Identify the pollutant-generating activities likely to be present at the project site; implement and maintain the corresponding pollution prevention practices. If an unlisted pollutant-generating activity is likely to be present at the project site, describe it, identify the associated pollutant(s), and provide the corresponding pollution prevention practice(s) to be implemented and maintained.

Section 6.0 Stormwater Management Controls
Identify the stormwater management controls to be implemented at the project site, if applicable. For each stormwater management control, enter the estimated installation date. If an unlisted stormwater management control will be implemented at the project site, provide the applicable information here.

Section 7.0 Spill Prevention & Response
Most spills can be cleaned up following manufacturer specifications. The priority should be to protect all people, equipment, property, and the environment. Enter the telephone number of your local fire and police departments.

Section 8.0 Inspections & Corrective Action Log
Enter the qualified inspector's company/organization name, the inspector's name, telephone number, and qualifications. Select the applicable inspection type, enter the construction activity inspection date, and enter the date and rainfall amount of the last measurable storm event (if applicable). Identify if the implemented best management practices are in compliance with the SWPPP. Enter corrective actions needed; the party responsible for implementing the corrective actions, and the date corrective actions were taken, if applicable. Make additional copies of the inspection and corrective action log as necessary.

Section 9.0 Grading & Stabilization Activities Log
Enter the date grading activities were initiated, a description of the grading activities including location, the date grading activities ceased, the date stabilization measures were initiated, and a description of the stabilization measures including location.

Section 10.0 SWPPP Modification & Update Log
Enter the SWPPP modification date, description of the SWPPP modification/update, and the name and title of the SWPPP modification preparer, if applicable.

NOT FOR CONSTRUCTION
THIS SHEET FOR CALCULATION PURPOSES ONLY

ARLINGTON VIRGINIA

Approved: 10/3/2022
Subject to field inspection
LDA22115

ARLINGTON VIRGINIA
DEPARTMENT OF ENVIRONMENTAL SERVICES
FACILITIES & ENGINEERING DIVISION
ENGINEERING BUREAU
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COMMONWEALTH OF VIRGINIA
ADAM M. BOBO
Lic. No. 055443
05-19-2022
PROFESSIONAL ENGINEER

APPROVALS	DATE
DESIGN TEAM ENGINEER SUPERVISOR	9/28/2022
CONSTRUCTION MANAGEMENT SUPERVISOR	10/13/22
WATER, SEWER, STREETS BUREAU CHIEF	10/5/22
TRANSPORTATION DIRECTOR Dennis M. Leach	10/5/22
PROJECT MANAGER Rens Harris	9/27/2022

REVISIONS	DATE

SHIRLINGTON ROAD PEDESTRIAN BRIDGE
BR02
SHIRLINGTON ROAD

STORMWATER POLLUTION PREVENTION PLAN - 2

DESIGNED: BD
DRAWN: BD
CHECKED: BG

PLOTTED: JULY 13 2022

SCALE:

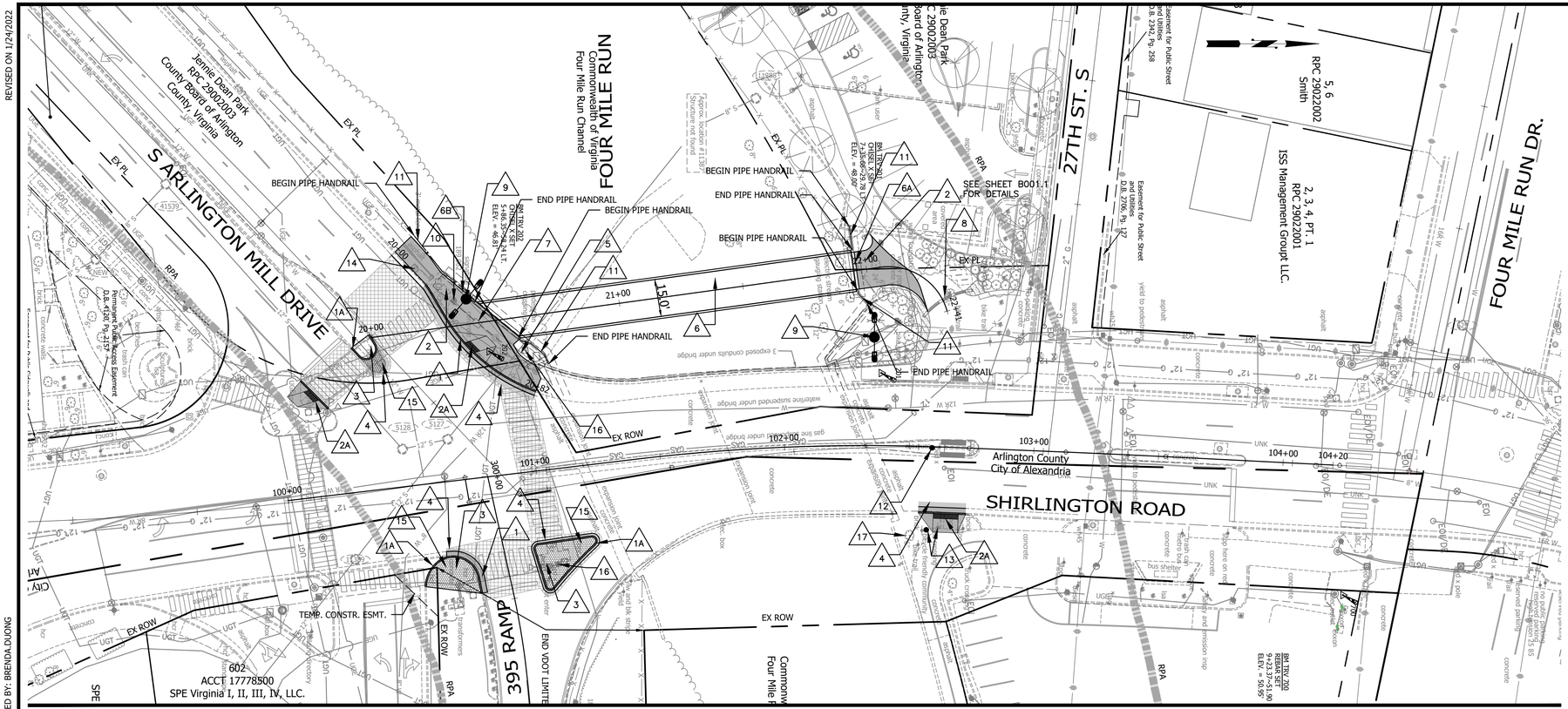
N/A

C035.2

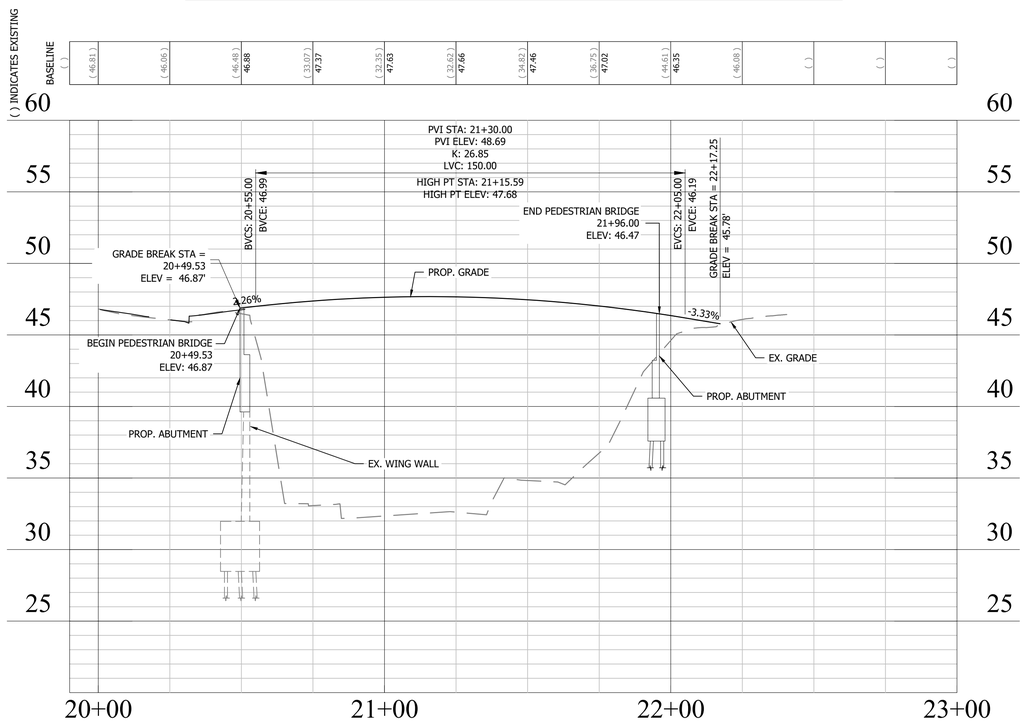
REVISED ON 1/24/2022

FILENAME: BR02-224-E_AND_S_PLAN.DWG PATH: T:\1009400 - MASTER-ARLINGTON COUNTY ON-CALL\1009450 - SHIRLINGTON RD PEDESTRIAN BRIDGE\07 DESIGN\DWG PLOTTED BY:: BRENDA.DUONG

REVISED ON 1/24/2022



SHIRLINGTON ROAD PEDESTRIAN BRIDGE PROFILE



CONSTRUCTION NOTES

1. PROP CURB AND GUTTER (C-2) ARL STD (R-2.0)
1A. PROP HEADER CURB (C-3) ARL STD (R-2.0)
2. PROP SIDEWALK ARL STD (R-2.0).
2A. PROP RAMP (CG-12A) VDOT ROAD & BRIDGE STANDARDS (204.02) SEE CURB RAMP DETAIL SHEET #C042.1
3. PROP SOD AND 4" TOPSOIL PER ARL. DES SUPPLEMENTAL SPECS 329100 AND 329200
4. SAWCUT AND RESTORE FULL DEPTH ASPHALT, SEE TYPICAL SECTIONS AND DETAILS FOR DEPTHS
5. REMOVE EXISTING GUARDRAIL. GUARDRAIL SECTION BETWEEN THE CONCRETE BRIDGE RAILING AND THE FIRST GUARDRAIL POST IS TO REMAIN. INSTALL ROUNDED END SECTION (VDOT STD. GR-HDW) ON END OF REMAINING GUARDRAIL SECTION. SEE SHEET C042.1 FOR DETAILS.
6. PROP PRE-FABRICATED PEDESTRIAN BRIDGE
6A. PROP ABUTMENT FOR PEDESTRIAN BRIDGE
6B. MODIFY EXISTING WING WALL TO ABUTMENT FOR PEDESTRIAN BRIDGE
7. CONTRACTOR SHALL INVESTIGATE THE CIRCUIT FOR THE EXISTING VDH JUNCTION BOX AND REMOVE THE JUNCTION BOX IF IT IS NO LONGER REQUIRED. IF THE JUNCTION BOX IS REQUIRED FOR THE EXISTING CIRCUIT, CONTRACTOR SHALL RELOCATE THE JUNCTION BOX ON THE PROPOSED SIDEWALK AS NECESSARY TO COMPLETE THE WINGALL MODIFICATIONS. COST FOR REMOVING OR RELOCATING THE EXISTING JUNCTION BOX SHALL BE INCIDENTAL TO OTHER ITEMS.
8. EXISTING PARK SIGN SHALL BE TEMPORARILY REMOVED AND REPLACED IF NECESSARY FOR CONSTRUCTION ACCESS. IF THE SIGN IS DAMAGED AS A RESULT OF REMOVING, STORING, OR REINSTALLING THE SIGN, IT SHALL BE REPAIRED OR REPLACED AT THE SOLE EXPENSE OF THE CONTRACTOR. THE CONTRACTOR SHALL RESTORE ALL DISTURBED AREAS IN THE PARK TO THEIR ORIGINAL CONDITION. COST SHALL BE INCLUDED IN THE BID PRICE FOR CONSTRUCTION ACCESS.
9. PROPOSED STREETLIGHT BY OTHERS. FOR CONDUIT AND JUNCTION BOX LOCATIONS, SEE SHEET C111.1.
10. EXISTING STREETLIGHT AND POLE TO BE REMOVED AND DELIVERED TO VDOT AT 8010 MASON KING COURT, MANASSAS, VA 20109. THE EXISTING FOUNDATION SHALL BE REMOVED TO BELOW THE PROPOSED SIDEWALK.
11. PROP PIPE HANDRAIL ARL. STD. (R-3.1) SEE SHEETS B001.4, B001.5, B001.6, AND B001.8 FOR DETAILS.
12. INSTALL FOUNDATION AND RRFB
13. RELOCATE EXISTING RRFB
14. REMOVE AND REPLACE EXISTING DROP INLET STRUCTURE TOP IN KIND
15. REMOVE EXISTING CONCRETE MEDIAN
16. REMOVE EXISTING PEDESTRIAN SIGNAL HEAD FOR NORTH LEG OF SHIRLINGTON ROAD AND ARLINGTON MILL DRIVE INTERSECTION
17. REMOVE AND REPLACE EXISTING TREE. LOCATION OF PROPOSED NEW TREE TO BE DETERMINED.

ARLINGTON VIRGINIA

Approved: 10/3/2022
Subject to field inspection
LDA22115

ARLINGTON
VIRGINIA

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COMMONWEALTH OF VIRGINIA
BRENDA DUONG
Lic. No. 052964
05-19-2022
PROFESSIONAL ENGINEER

APPROVALS	DATE
DESIGN TEAM ENGINEER SUPERVISOR	9/28/2022
CONSTRUCTION MANAGEMENT SUPERVISOR	10/13/22
WATER/SEWER, STREETS BUREAU CHIEF	10/5/22
TRANSPORTATION DIRECTOR	10/5/22
PROJECT MANAGER	9/27/2022

REVISIONS	DATE

SHIRLINGTON ROAD PEDESTRIAN BRIDGE
BR02
SHIRLINGTON ROAD

PLAN AND PROFILE

DESIGNED: BD
DRAWN: BD
CHECKED: BG

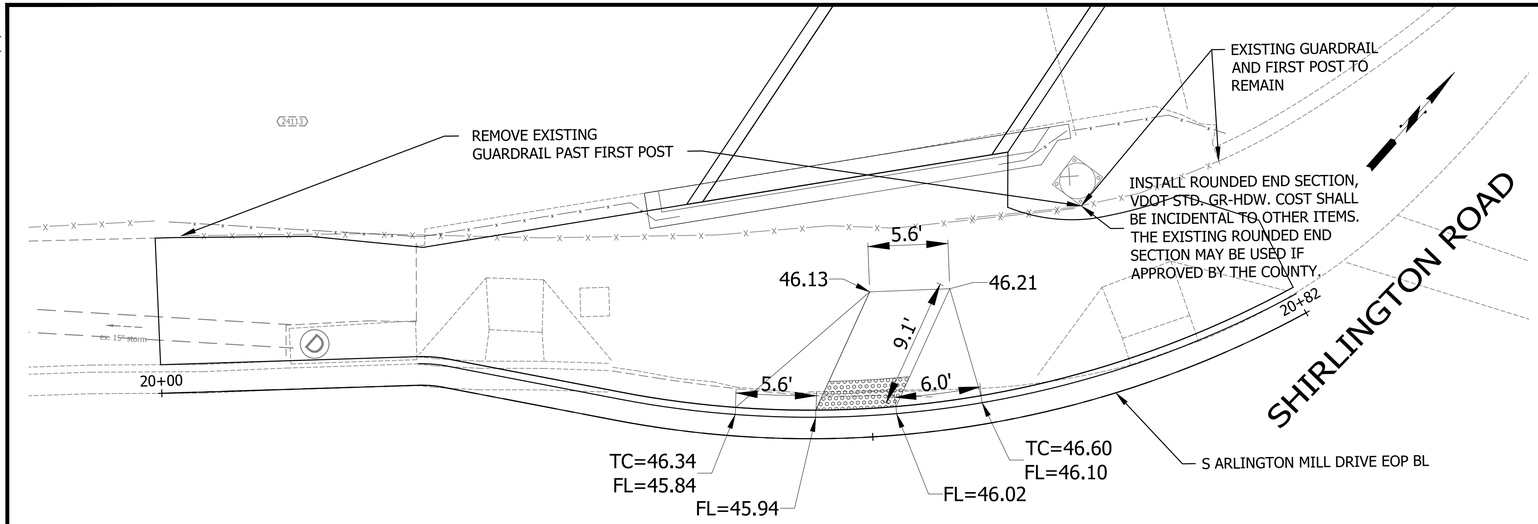
PLOTTED: JULY 13 2022

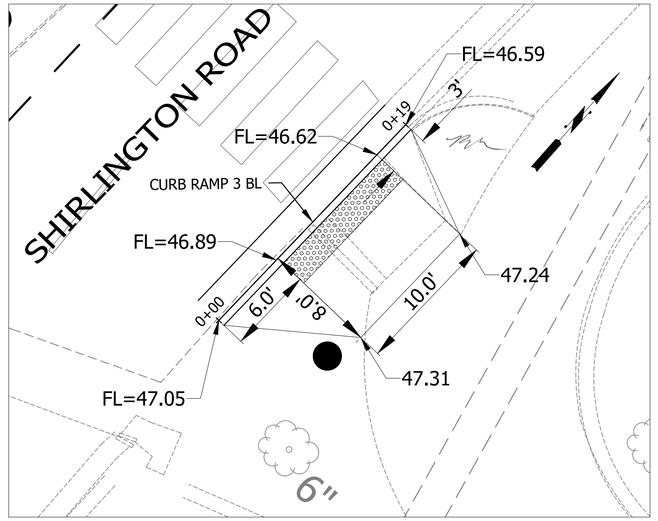
SCALE:
0 5 10
VERT. SCALE
0 25 50
HORIZ. SCALE

C041.1

FILENAME: BR02-230-PLAN_PROFILE.DWG PATH: T:\1009400 - MASTER-ARLINGTON COUNTY ON-CALL\1009450 - SHIRLINGTON RD PEDESTRIAN BRIDGE\07 DESIGN\DWG PLOTTED BY: BRENDA.DUONG

REVISED ON 1/24/2022

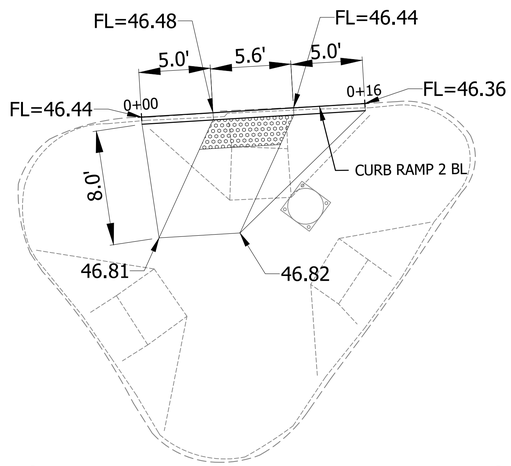




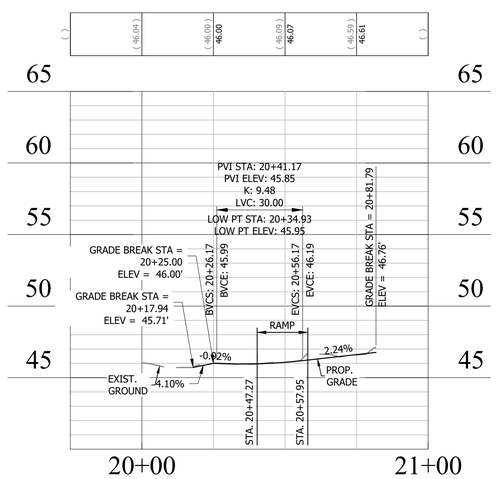
HORIZ. SCALE 0 5 10

HORIZ. SCALE 0 5 10

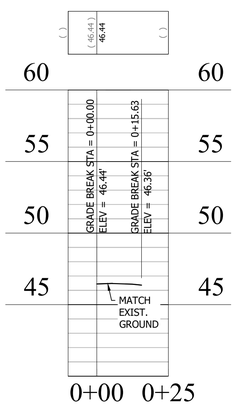
S ARLINGTON MILL DRIVE
MEDIAN NOT SHOWN



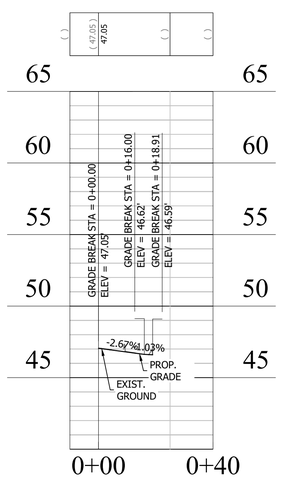
S ARLINGTON MILL DRIVE EOP PROFILE



CURB RAMP 2 PROFILE



CURB RAMP 3 PROFILE

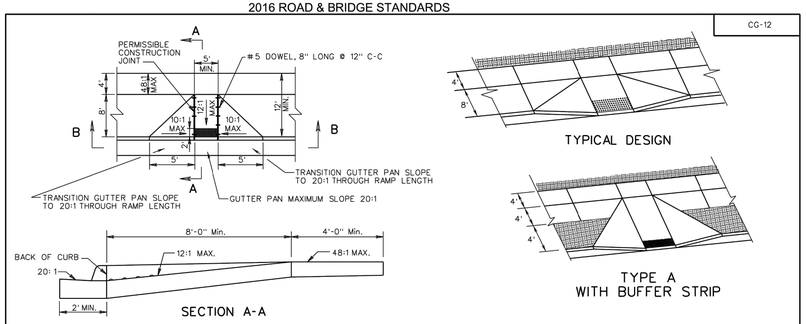


VERT. SCALE 0 5 10

HORIZ. SCALE 0 25 50

2016 ROAD & BRIDGE STANDARDS

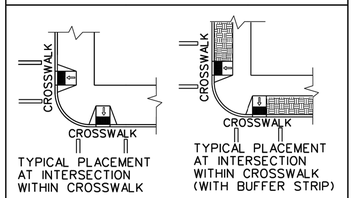
CG-12



NOTES:

1. FOR GENERAL NOTES ON THE DETECTABLE WARNING SURFACE, SEE SHEET 1 OF 5.
2. THIS DESIGN TO BE USED FOR CONSTRUCTION THAT INCORPORATES WIDER SIDEWALK, LANDING (4' WIDE) REQUIRED AT TOP OF CURB RAMP. MINIMUM CURB RAMP LENGTH 8 FEET FOR NEW CONSTRUCTION.
3. GUTTER PAN SHALL BE A MAXIMUM SLOPE OF 20:1 AT THE RAMP OPENING.
4. DIAGONAL PLACEMENT IS NOT PERMITTED.

EXAMPLE INSTALLATION METHODS - SEE PLANS FOR LAYOUT



SPECIFICATION REFERENCE	A COPY OF THE ORIGINAL SEALED AND SIGNED DRAWING IS ON FILE IN THE CENTRAL OFFICE. CG-12 DETECTABLE WARNING SURFACE TYPE A (PERPENDICULAR) APPLICATION VIRGINIA DEPARTMENT OF TRANSPORTATION	VDOT ROAD AND BRIDGE STANDARDS
105 502 504		REVISION DATE 04/19 · SHEET 2 OF 5 · 204.02

2016 ROAD & BRIDGE STANDARDS

ARLINGTON VIRGINIA

Approved: 10/3/2022
Subject to field inspection
ELDA22115

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BRENDA DUONG
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05-19-2022
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APPROVALS	DATE
DESIGN TEAM ENGINEER SUPERVISOR	9/28/2022
CONSTRUCTION MANAGEMENT SUPERVISOR	10/13/22
WATER/SEWER, STREETS BUREAU CHIEF	10/5/22
TRANSPORTATION DIRECTOR	10/5/22
PROJECT MANAGER	9/27/2022

REVISIONS	DATE

SHIRLINGTON ROAD PEDESTRIAN BRIDGE
BR02
SHIRLINGTON ROAD
CURB RAMP DETAILS

DESIGNED: BD
DRAWN: BD
CHECKED: BG

PLOTTED: JULY 13 2022

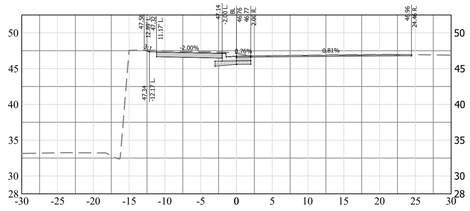
SCALE:

AS SHOWN

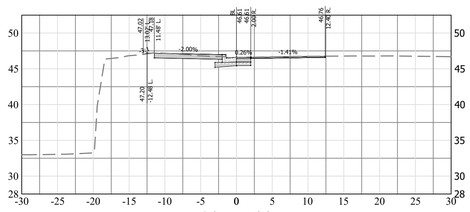
C042.1

FILENAME: BR02-232-CURB_RAMP_DETAILS.DWG PATH: T:\1009400 - MASTER-ARLINGTON COUNTY ON-CALL\1009450 - SHIRLINGTON RD PEDESTRIAN BRIDGE\07 DESIGN\DWG PLOTTED BY: BRENDA.DUONG

S ARLINGTON MILL DRIVE EOP CROSS SECTIONS



20+81.75



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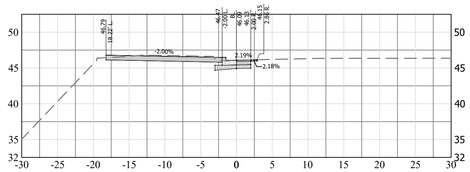
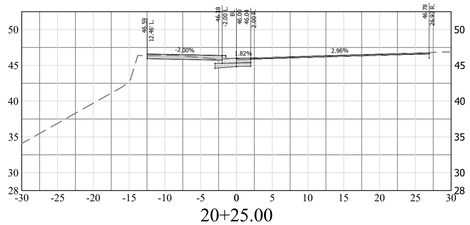
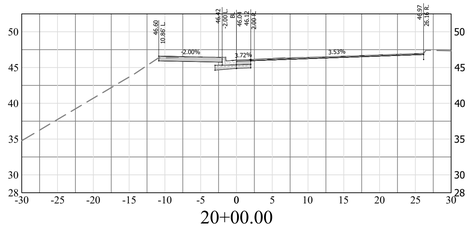


20+50.00



20+25.00



20+00.00

ARLINGTON VIRGINIA

Approved: 10/3/2022
Subject to field inspection
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COMMONWEALTH OF VIRGINIA
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Lic. No. 052964
05-19-2022
PROFESSIONAL ENGINEER

APPROVALS	DATE
DESIGN TEAM ENGINEER SUPERVISOR	9/28/2022
CONSTRUCTION MANAGEMENT SUPERVISOR	10/13/22
WATER/SEWER, STREETS BUREAU CHIEF	10/5/22
TRANSPORTATION DIRECTOR	10/5/22
PROJECT MANAGER	9/27/2022

REVISIONS	DATE

SHIRLINGTON ROAD PEDESTRIAN BRIDGE
BR02
SHIRLINGTON ROAD

CROSS SECTION SHEET

DESIGNED: BD
DRAWN: BD
CHECKED: BG

PLOTTED: JULY 13 2022

SCALE:

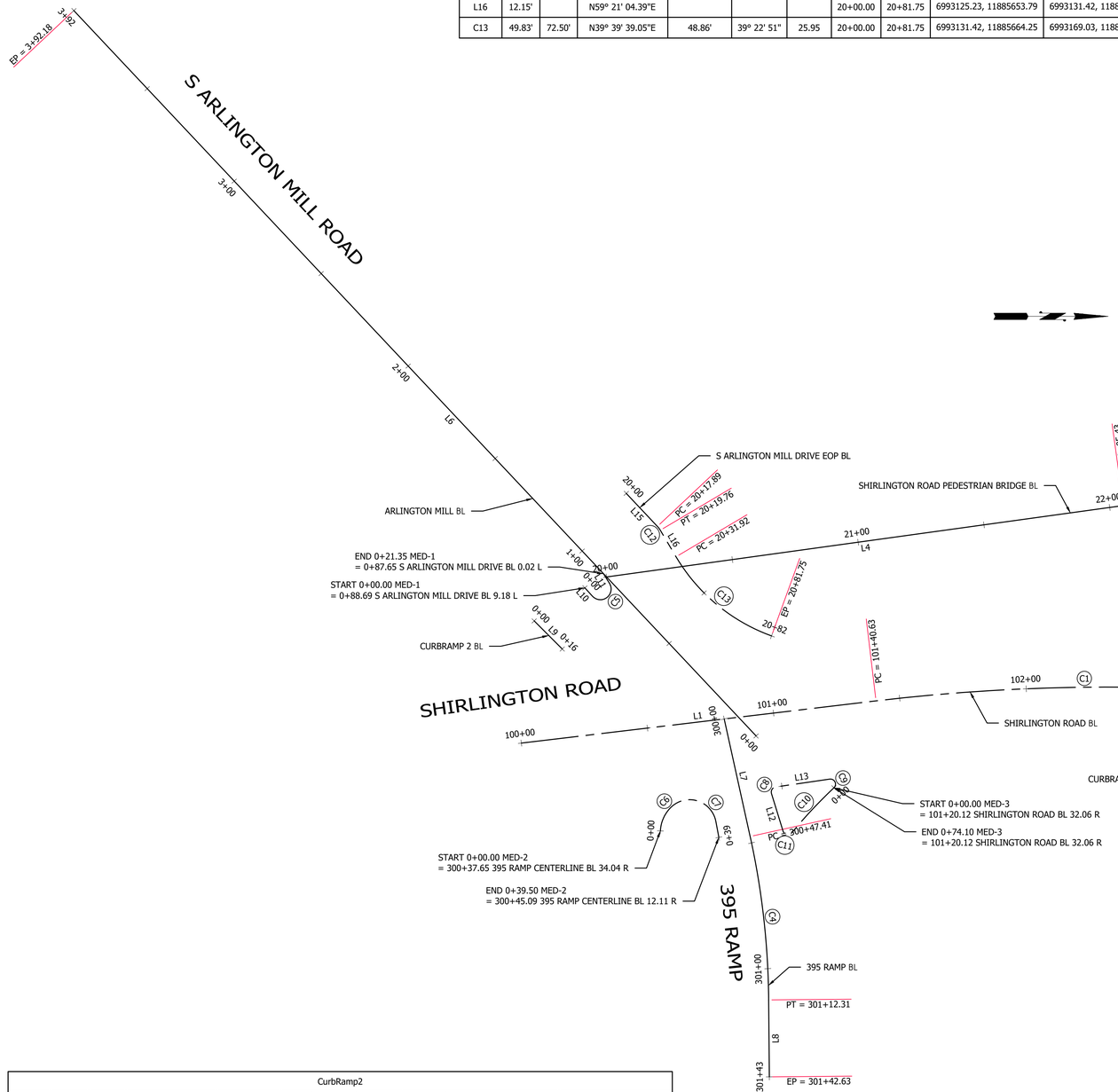
AS SHOWN

C044.1

REVISED ON 1/24/2022

FILENAME: BR02-234-CROSS_SECTIONS.DWG PATH: T:\1009400 - MASTER-ARLINGTON COUNTY ON-CALL\1009450 - SHIRLINGTON RD PEDESTRIAN BRIDGE\07 DESIGN\DWG PLOTTED BY: BRENDA.DUONG

REVISED ON 1/24/2022



S Arlington Mill Drive EOP										
Number	Length	Radius	Line/Chord Direction	Chord Length	Delta	Tangent	STA (Start)	STA (End)	Northing, Easting (Start)	Northing, Easting (End)
L15	17.89'		N46° 42' 14.89"E				20+00.00	20+81.75	6993111.83, 11885639.28	6993124.10, 11885652.29
C12	1.88'	8.50'	N53° 01' 39.64"E	1.87'	12° 38' 50"	0.94	20+00.00	20+81.75	6993124.10, 11885652.29	6993125.23, 11885653.79
L16	12.15'		N59° 21' 04.39"E				20+00.00	20+81.75	6993125.23, 11885653.79	6993131.42, 11885664.25
C13	49.83'	72.50'	N39° 39' 39.05"E	48.86'	39° 22' 51"	25.95	20+00.00	20+81.75	6993131.42, 11885664.25	6993169.03, 11885695.43

Shirlington Road										
Number	Length	Radius	Line/Chord Direction	Chord Length	Delta	Tangent	STA (Start)	STA (End)	Northing, Easting (Start)	Northing, Easting (End)
L1	140.63'		N06° 47' 31.83"W				100+00.00	104+20.00	6993070.52, 11885737.64	6993210.17, 11885721.01
C1	123.89'	776.00'	N02° 13' 07.17"W	123.75'	9° 08' 49"	62.07	100+00.00	104+20.00	6993210.17, 11885721.01	6993333.83, 11885716.22
L2	48.34'		N02° 21' 17.49"E				100+00.00	104+20.00	6993333.83, 11885716.22	6993382.13, 11885718.20
C2	39.99'	4330.00'	N02° 37' 09.99"E	39.99'	0° 31' 45"	20.00	100+00.00	104+20.00	6993382.13, 11885718.20	6993422.08, 11885720.03
L3	67.15'		N02° 53' 02.48"E				100+00.00	104+20.00	6993422.08, 11885720.03	6993489.14, 11885723.41

Shirlington Road Pedestrian Bridge										
Number	Length	Radius	Line/Chord Direction	Chord Length	Delta	Tangent	STA (Start)	STA (End)	Northing, Easting (Start)	Northing, Easting (End)
L4	205.43'		N07° 52' 12.34"W				20+00.00	22+40.52	6993104.07, 11885672.20	6993307.57, 11885644.07
C3	35.09'	24.50'	N33° 09' 28.16"E	32.16'	82° 03' 21"	21.32	20+00.00	22+40.52	6993307.57, 11885644.07	6993334.49, 11885661.67

ARLINGTON MILL										
Number	Length	Radius	Line/Chord Direction	Chord Length	Delta	Tangent	STA (Start)	STA (End)	Northing, Easting (Start)	Northing, Easting (End)
L6	392.18'		S46° 45' 52.57"W				0+00.00	3+92.18	6993162.96, 11885734.83	6992894.31, 11885449.11

395 Ramp										
Number	Length	Radius	Line/Chord Direction	Chord Length	Delta	Tangent	STA (Start)	STA (End)	Northing, Easting (Start)	Northing, Easting (End)
L7	47.41'		N77° 33' 29.40"E				300+00.00	301+42.63	6993150.40, 11885728.13	6993160.61, 11885774.43
C4	64.90'	311.00'	N83° 32' 11.69"E	64.78'	11° 57' 25"	32.57	300+00.00	301+42.63	6993160.61, 11885774.43	6993167.90, 11885838.80
L8	30.32'		N89° 30' 53.97"E				300+00.00	301+42.63	6993167.90, 11885838.80	6993168.16, 11885869.11

MED-1										
Number	Length	Radius	Line/Chord Direction	Chord Length	Delta	Tangent	STA (Start)	STA (End)	Northing, Easting (Start)	Northing, Easting (End)
L10	4.42'		N47° 29' 45.06"E				0+00.00	0+21.35	6993095.52, 11885676.50	6993098.50, 11885679.76
C5	12.51'	4.22'	N36° 41' 11.17"W	8.40'	169° 52' 10"	47.59	0+00.00	0+21.35	6993098.50, 11885679.76	6993105.24, 11885674.74
L11	4.42'		S58° 04' 30.72"W				0+00.00	0+21.35	6993105.24, 11885674.74	6993102.91, 11885670.99

MED-2										
Number	Length	Radius	Line/Chord Direction	Chord Length	Delta	Tangent	STA (Start)	STA (End)	Northing, Easting (Start)	Northing, Easting (End)
C6	10.32'	14.00'	N66° 06' 43.63"W	10.08'	42° 13' 17"	5.41	0+00.00	0+39.50	6993125.27, 11885772.23	6993129.35, 11885763.01
C7	22.77'	10.50'	N17° 08' 07.28"E	18.57'	124° 16' 25"	19.86	0+00.00	0+39.50	6993129.35, 11885763.01	6993147.09, 11885768.48

MED-3										
Number	Length	Radius	Line/Chord Direction	Chord Length	Delta	Tangent	STA (Start)	STA (End)	Northing, Easting (Start)	Northing, Easting (End)
C10	24.26'	185.70'	S46° 53' 56.81"E	24.25'	7° 29' 12"	12.15	0+00.00	0+74.10	6993193.59, 11885755.27	6993177.02, 11885772.97
C11	4.31'	2.00'	S11° 07' 05.97"W	3.52'	123° 31' 17"	3.72	0+00.00	0+74.10	6993177.02, 11885772.97	6993173.57, 11885772.29
L12	15.48'		S72° 52' 44.65"W				0+00.00	0+74.10	6993173.57, 11885772.29	6993169.01, 11885757.50
C8	3.45'	2.00'	N57° 41' 56.47"W	3.04'	98° 50' 38"	2.34	0+00.00	0+74.10	6993169.01, 11885757.50	6993170.63, 11885754.93
L13	21.53'		N08° 16' 37.58"W				0+00.00	0+74.10	6993170.63, 11885754.93	6993191.94, 11885751.83
C9	5.07'	2.00'	N64° 17' 00.76"E	3.82'	145° 07' 17"	6.37	0+00.00	0+74.10	6993191.94, 11885751.83	6993193.59, 11885755.27

CurbRamp2										
Number	Length	Radius	Line/Chord Direction	Chord Length	Delta	Tangent	STA (Start)	STA (End)	Northing, Easting (Start)	Northing, Easting (End)
L9	15.63'		N45° 01' 36.54"E				0+00.00	0+15.63	6993075.58, 11885689.52	6993086.62, 11885700.58

CurbRamp3										
Number	Length	Radius	Line/Chord Direction	Chord Length	Delta	Tangent	STA (Start)	STA (End)	Northing, Easting (Start)	Northing, Easting (End)
L14	18.91'		N02° 11' 03.25"E				0+00.00	0+18.91	6993322.97, 11885742.07	6993341.87, 11885742.79

ARLINGTON VIRGINIA

Approved: 10/3/2022
Subject to field inspection
LDA22115

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BRENDA DUONG
Lic. No. 052964
05-19-2022
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APPROVALS	DATE
DESIGN TEAM ENGINEER SUPERVISOR	9/28/2022
CONSTRUCTION MANAGEMENT SUPERVISOR	10/13/22
WATER/SEWER, STREETS BUREAU CHIEF	10/5/22
TRANSPORTATION DIRECTOR	10/5/22
PROJECT MANAGER	9/27/2022

REVISIONS	DATE

SHIRLINGTON ROAD PEDESTRIAN BRIDGE
BR02
SHIRLINGTON ROAD

GEOMETRIC CONTROL PLAN

DESIGNED: BD
DRAWN: BD
CHECKED: BG

PLOTTED: JULY 13 2022

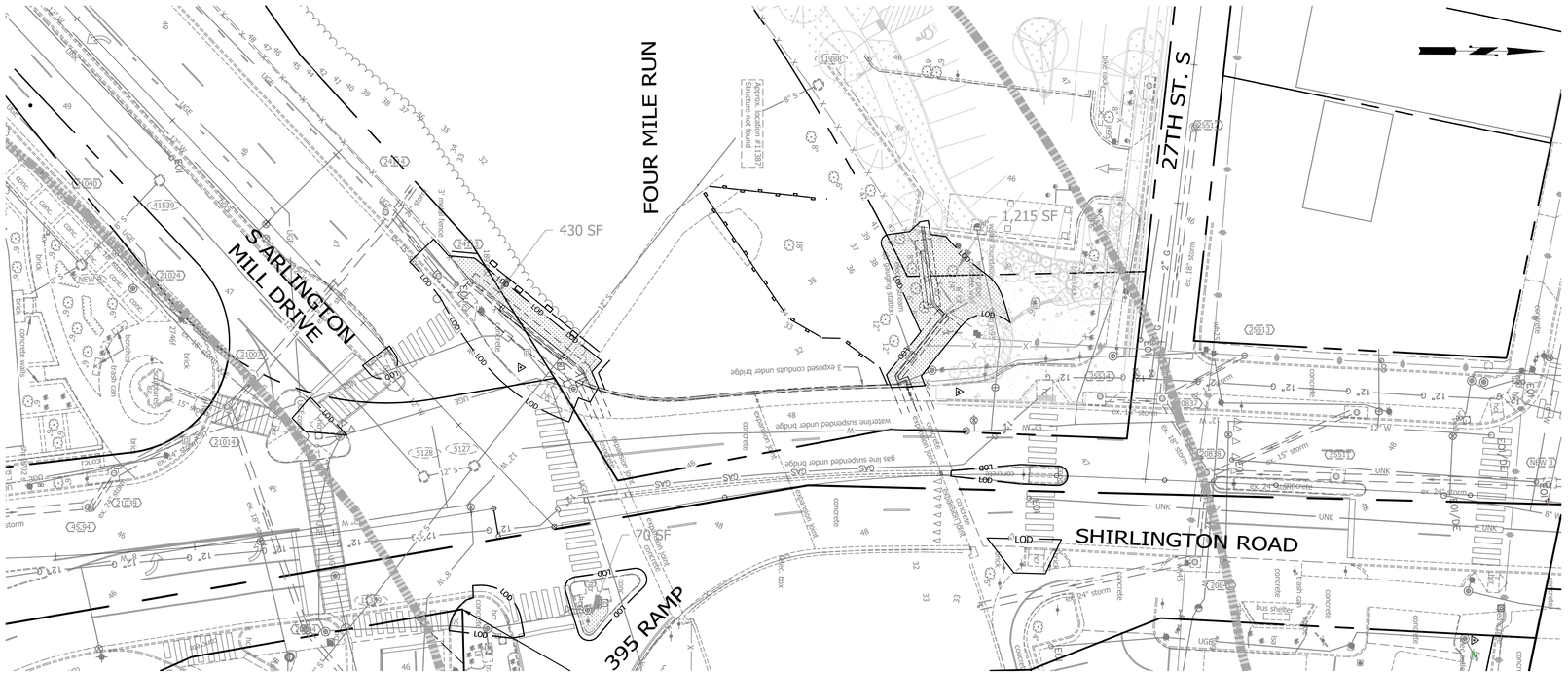
SCALE:

0 25 50
GRAPHIC SCALE

C045.1

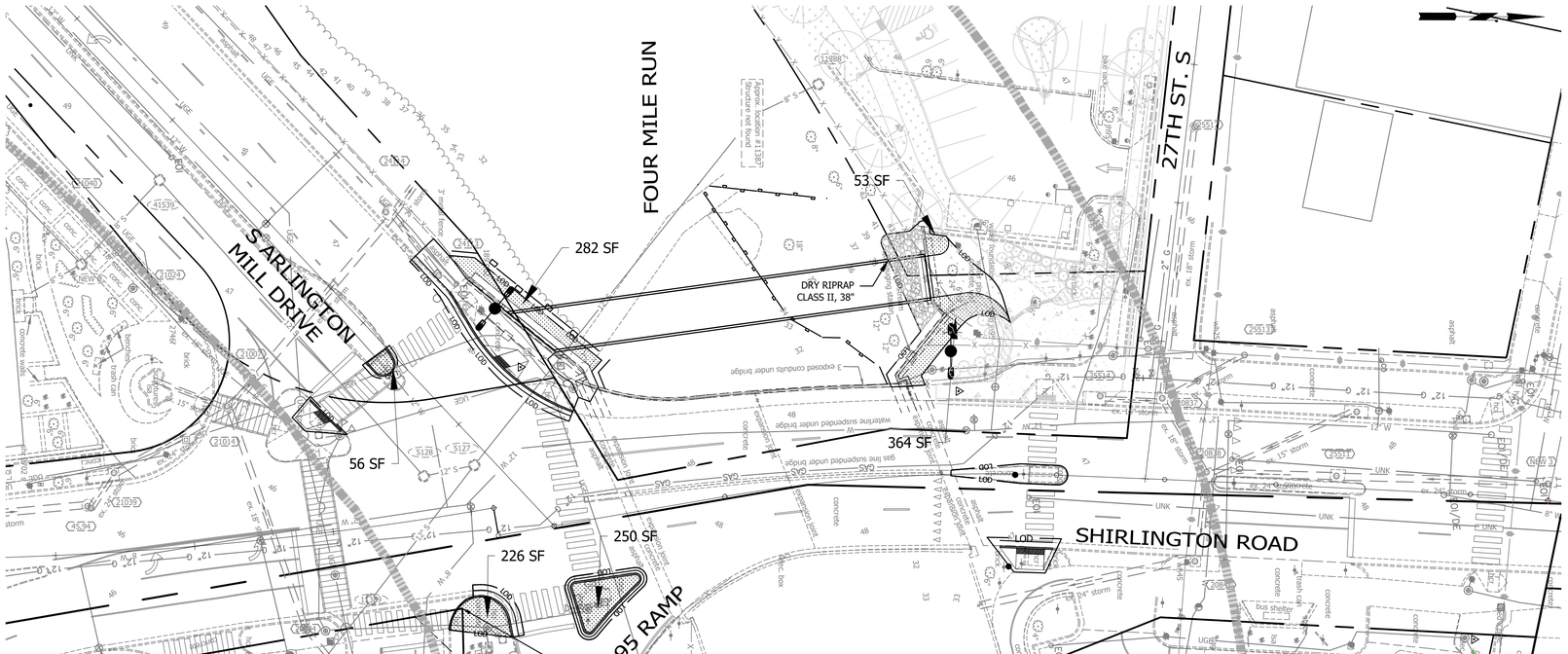
FILENAME: BR02-216-GEOMETRIC_CONTROL_PLAN.DWG PATH: T:\1009400 - MASTER-ARLINGTON COUNTY ON-CALL\1009450 - SHIRLINGTON RD PEDESTRIAN BRIDGE\07 DESIGN\DWG PLOTTED BY: BRENDA.DUONG

REVISED ON 1/24/2022



STORMWATER MANAGEMENT PLAN PRE-DEVELOPMENT CONDITIONS

TOTAL PROJECT AREA					
	PRE		POST		
	sf	ac	sf	ac	Change in impervious
Project Limits of DISTURBANCE	4567	0.1048	4567	0.1048	
Pervious	1715	0.0394	1530	0.0351	
Impervious	2852	0.0655	3037	0.0697	0.0042 ac (6.5%)



STORMWATER MANAGEMENT PLAN POST-DEVELOPMENT CONDITIONS

LEGEND

GRASS AREA FOR PRE-DEVELOPMENT CONDITIONS

GRASS AREA FOR POST-DEVELOPMENT CONDITIONS

NOT FOR CONSTRUCTION
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ARLINGTON VIRGINIA

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05-19-2022
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WATER/SEWER, STREETS BUREAU CHIEF	10/5/22
TRANSPORTATION DIRECTOR	10/5/22
PROJECT MANAGER	9/27/2022

REVISIONS	DATE

SHIRLINGTON ROAD PEDESTRIAN BRIDGE
BR02
SHIRLINGTON ROAD

STORMWATER MANAGEMENT PLAN

DESIGNED: BD
DRAWN: BD
CHECKED: BG

PLOTTED: JULY 13 2022

SCALE:

0 25 50
GRAPHIC SCALE

C081.1

FILENAME: BR02-254-SWM_DIVIDES_COMPS.DWG PATH: T:\1009400 - MASTER-ARLINGTON COUNTY ON-CALL\1009450 - SHIRLINGTON RD PEDESTRIAN BRIDGE\07 DESIGN\DWG PLOTTED BY: BRENDA.DUONG

DEQ Virginia Runoff Reduction Method Re-Development Compliance Spreadsheet - Version 3.0

☐ 2011 BMP Standards and Specifications ☒ 2013 Draft BMP Standards and Specifications

CLEAR ALL (Ctrl+Shift+R)

data input cells | constant values | calculation cells | final results

Project Name: Shirlington Pedestrian Bridge
Date: 2/17/2022
Linear Development Project? Yes

Site Information

Post-Development Project (Treatment Volume and Loads)

Enter Total Disturbed Area *(acres)* → 0.11

Check:
BMP Design Specifications List: 2013 Draft Stds & Specs
Linear project? Yes
Land cover areas entered correctly? ✓
Total disturbed area entered? ✓

Maximum reduction required:	20%
The site's net increase in impervious cover (acres) is:	0
Post-Development TP Load Reduction for Site (lb/yr):	0.03

Pre-ReDevelopment Land Cover (acres)

	A Soils	B Soils	C Soils	D Soils	Totals
Forest/Open Space (acres) -- undisturbed forest/open space				0.04	0.04
Managed Turf (acres) -- disturbed, graded for yards or other turf to be mowed/managed					0.00
Impervious Cover (acres)				0.07	0.07
					0.11

Post-Development Land Cover (acres)

	A Soils	B Soils	C Soils	D Soils	Totals
Forest/Open Space (acres) -- undisturbed, protected forest/open space or reforested land				0.04	0.04 *
Managed Turf (acres) -- disturbed, graded for yards or other turf to be mowed/managed					0.00
Impervious Cover (acres)				0.07	0.07
Area Check	OK.	OK.	OK.	OK.	0.11

** Forest/Open Space areas must be protected in accordance with the Virginia Runoff Reduction Method*

Constants

Annual Rainfall (inches)	43
Target Rainfall Event (inches)	1.00
Total Phosphorus (TP) EMC (mg/L)	0.26
Total Nitrogen (TN) EMC (mg/L)	1.86
Target TP Load (lb/acre/yr)	0.41
Pj (unitless correction factor)	0.90

Runoff Coefficients (Rv)

	A Soils	B Soils	C Soils	D Soils
Forest/Open Space	0.02	0.03	0.04	0.05
Managed Turf	0.15	0.20	0.22	0.25
Impervious Cover	0.95	0.95	0.95	0.95

LAND COVER SUMMARY -- PRE-REDEVELOPMENT

Land Cover Summary-Pre Pre-ReDevelopment	Listed	Adjusted[1]
Forest/Open Space Cover (acres)	0.04	0.04
Weighted Rv(forest)	0.05	0.05
% Forest	36%	36%
Managed Turf Cover (acres)	0.00	0.00
Weighted Rv(turf)	0.00	0.00
% Managed Turf	0%	0%
Impervious Cover (acres)	0.07	0.07
Rv(impervious)	0.95	0.95
% Impervious	64%	64%
Total Site Area (acres)	**0.11**	**0.11**
Site Rv	**0.62**	**0.62**

LAND COVER SUMMARY -- POST DEVELOPMENT

Land Cover Summary-Post (Final) Post ReDev. & New Impervious	
Forest/Open Space Cover (acres)	0.04
Weighted Rv(forest)	0.05
% Forest	36%
Managed Turf Cover (acres)	0.00
Weighted Rv (turf)	0.00
% Managed Turf	0%
Impervious Cover (acres)	0.07
Rv(impervious)	0.95
% Impervious	64%
Final Site Area (acres)	**0.11**
Final Post Dev Site Rv	**0.62**

Land Cover Summary-Post Post-ReDevelopment	
Forest/Open Space Cover (acres)	0.04
Weighted Rv(forest)	0.05
% Forest	36%
Managed Turf Cover (acres)	0.00
Weighted Rv (turf)	0.00
% Managed Turf	0%
ReDev. Impervious Cover (acres)	0.07
Rv(impervious)	0.95
% Impervious	64%
Total ReDev. Site Area (acres)	**0.11**
ReDev Site Rv	**0.62**

Land Cover Summary-Post Post-Development New Impervious	
New Impervious Cover (acres)	0.00
Rv(impervious)	--

Treatment Volume and Nutrient Load

Pre-ReDevelopment Treatment Volume (acre-ft)	0.0057	0.0057
Pre-ReDevelopment Treatment Volume (cubic feet)	249	249
Pre-ReDevelopment TP Load (lb/yr)	**0.16**	**0.16**
Pre-ReDevelopment TP Load per acre (lb/acre/yr)	1.42	1.42
Baseline TP Load (lb/yr) **(0.41 lbs/acre/yr** applied to pre-redevelopment area excluding pervious land proposed for new impervious cover)		*0.05*

Treatment Volume and Nutrient Load

Final Post-Development Treatment Volume (acre-ft)	0.0057	
Final Post-Development Treatment Volume (cubic feet)	249	
Final Post-Development TP Load (lb/yr)	**0.16**	
Final Post-Development TP Load per acre (lb/acre/yr)	1.42	

Treatment Volume and Nutrient Load

Post-ReDevelopment Treatment Volume (acre-ft)	0.0057	
Post-ReDevelopment Treatment Volume (cubic feet)	249	
Post-ReDevelopment Load (TP) (lb/yr)*	**0.16**	
Post-ReDevelopment TP Load per acre (lb/acre/yr)	1.42	
Max. Reduction Required (Below Pre-ReDevelopment Load)	**20%**	
TP Load Reduction Required for Redeveloped Area (lb/yr)	**0.03**	

Post-Development Treatment Volume (acre-ft)	--
Post-Development Treatment Volume (cubic feet)	--
Post-Development TP Load (lb/yr)	--
TP Load Reduction Required for New Impervious Area (lb/yr)	**0**

[1] *Adjusted Land Cover Summary:*
Pre ReDevelopment land cover minus pervious land cover (forest/open space or managed turf) acreage proposed for new impervious cover.

Adjusted total acreage is consistent with Post-ReDevelopment acreage (minus acreage of new impervious cover).

Column I shows load reduction requirement for new impervious cover (based on new development load limit, 0.41 lbs/acre/year).

Post-Development Requirement for Site Area

TP Load Reduction Required (lb/yr)	**0.03**
Linear Project TP Load Reduction Required (lb/yr):	0.03

Nitrogen Loads (Informational Purposes Only)

Pre-ReDevelopment TN Load (lb/yr)	1.12	Final Post-Development TN Load (Post-ReDevelopment & New Impervious) (lb/yr)	1.12

STORMWATER NARRATIVE

The Runoff Reduction Spreadsheet information on this plan is for data tracking purposes to document the area of land disturbance and to characterize pre-and post development land use conditions.

In accordance with Arlington County's Chesapeake Bay Total Maximum Daily Load (TMDL) Action Plan, approved by the Virginia Department of Environmental Quality (DEQ) on September 1, 2015, linear development projects conducted by the County are administered and tracked as follows consistent with 9vac25-870-69.A.4, 9VAC25-870-76, and 9VAC25-870-92:

- Pollutant load changes will be computed as described in Section 3.A of the Action Plan.
- Retrofit opportunities will be evaluated for each project, using the screening and selection criteria applied and described in the adopted Stormwater Master Plan.
- Retrofit projects that meet the screening criteria and are determined by Arlington to be feasible and cost effective will be implemented with specific linear development projects. Pollutant load reductions from retrofit projects will be computed as described in Section 5 of the Action Plan.
- In cases where retrofit projects are not feasible and cost-effective for a particular linear project, any POC load increases that might occur for that project will be addresses by larger overall POC load reductions in place or added through TMDL action plan implementation.

In the above manner Arlington, as the MS4 operator and construction site operator for its linear development projects, implements linear projects and retrofit projects in a manner that achieves the most TMDL POC reduction for the least cost, while fully accounting for load changes occur with linear development project activity consistent with the DEW Cheaspeake Bay TMDL Special Condition Guidance.

NOT FOR CONSTRUCTION
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ARLINGTON VIRGINIA

Approved: 10/3/2022
Subject to field inspection
LDA22115

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SEAL

COMMONWEALTH OF VIRGINIA
ADAM M. ROBO
Lic. No. 055443
05-19-2022
PROFESSIONAL ENGINEER

APPROVALS	DATE
DESIGN TEAM ENGINEER SUPERVISOR	9/28/2022
CONSTRUCTION MANAGEMENT SUPERVISOR	10/13/22
WATER/SEWER, STREETS BUREAU CHIEF	10/5/22
TRANSPORTATION DIRECTOR	10/5/22
PROJECT MANAGER	9/27/2022

REVISIONS	DATE

SHIRLINGTON ROAD PEDESTRIAN BRIDGE
BR02
SHIRLINGTON ROAD
VRRM SPREADSHEET

DESIGNED: BD
DRAWN: BD
CHECKED: BG

PLOTTED: JULY 13 2022

SCALE:

0 25 50
GRAPHIC SCALE

C081.2

Appendix C. Water Quality Impact Assessment Data Sheet

Project Address: S Arlington Mill Drive intersecting Shirlington Road	Date: January 27, 2022
Applicant Name/Affiliation: DES/OD/WSS	Applicant Contact Information (phone and email): Zoran Dragacevac, P.E.: zdragacevac@arlingtonva/us
Owner/Client Name: DES/OD/WSS	Owner/Client Contact Information (phone and email): Zoran Dragacevac, P.E.: 703-228-6509

Section 1: Type of activity proposed

Activity type (check all that apply):	
☐ New construction (residential, commercial, public, etc.)	☐ Deck, patio, or retaining wall
☐ Alteration of non-residential structure	☐ Landscaping (includes tree removal)
☐ Residential addition	☐ Utility work
☐ Detached residential structure	☐ Fence
	X Other (please describe): Public Works Pedestrian Bridge Project PN: BR02

Section 2: Key details of the proposed activity

Complete all that apply		Explanation
Total area of disturbance on parcel (sf)	4,567 SF	Includes building footprint plus a 10 foot buffer. Also includes all soil disturbance, ingress/egress areas, stockpiling areas, etc.
Area of disturbance within RPA (sf)	4,567SF	Includes removal of trees ≥ 3" in diameter
Area of disturbance on slopes greater than or equal to 15 percent located adjacent to landward RPA boundary (sf)	0 SF	Does not apply to RPA parcels along Chain Bridge Road (15 percent and greater slopes are included as part of RPA)

Complete all fields		Existing condition	Proposed condition	Explanation
RPA encroachment (ft)	Left third of the stream	0 LF	0 LF	The **distance** (in feet) from the existing or proposed structure to the designated RPA feature (edge of stream or open channel, wetland, etc.). Encroachments of zero (0) indicate the project will impact the stream or other RPA feature. The measurement was done from the RPA to the edge of the stream.
	Middle third of the stream	N/A	N/A	
	Right third of the stream	0 LF	0 LF	
Total development footprint in RPA (sf)		4,567 SF	4,567 SF	The existing footprint includes the **area** of any existing structures, patios, decks, walkways, etc. Proposed footprint is the anticipated post-project area of all structures, additions, decks, walkways, regraded area behind a retaining wall, etc.
Impervious footprint in RPA (sf)		2,852 SF	3,037 SF	Total **area** of impervious surfaces within the RPA (rooftops, pavement, etc.)

(OVER)

STAFF USE ONLY

Building/demolition/LDA/Fence permit number(s):

Major WQIA required? ☐ Yes ☐ No

Date WQIA/Exception request information complete:

Date Chesapeake Bay Preservation Ordinance and E/S ordinance (if applicable) approvals issued in Permits Plus:

Section 3: Plan and Narrative

Provide a plan showing the location of the proposed activity, along with the RPA boundary. Briefly describe the proposed project, including any potential water quality impacts and mitigation measures proposed.

The narrative must address three impact categories

1. Tree/vegetation impacts
2. Stormwater and runoff
3. Erosion and sediment control. Please refer to the WQIA plan/narrative checklist for additional information.

PROJECT DESCRIPTION

The Shirlington Road Pedestrian Bridge Project proposes to construct a pedestrian bridge over Four Mile Run adjacent to the existing bridge on Shirlington Road along with a sidewalk tie-in from the existing sidewalk from the Jeanie Dean Project and removal and installation of a new curb and gutter along South Arlington Mill Drive.

APPLICABILITY OF SWM CRITERIA

Per the Virginia Stormwater Management Program (VSMP) criteria set forth in 9VAC25-970-66, the developmental regulations and post-construction requirements of Technical Criteria Part IIB are applicable to any re-development or new-development projects with Regulated Land Disturbance Area of one acre or greater, or 2,500 square feet or greater in designated Chesapeake Bay Preservation Areas (CBPA), including Resource Protection Areas (RPA). The RPA Map included in the Appendix B of this document shows that the project is within the limits of the RPA for the Four Mile Run base channel. Therefore, the 2,500 square foot limit of land disturbance area applies to Stormwater Management (SWM) and Erosion and Sediment Control (ESC) requirements.

The proposed pedestrian bridge will have newly constructed components for the superstructure and the substructure. The superstructure will be a prefabricated steel truss bridge with a wooden deck using southern yellow pine with a span of 142' – 4" from the center of bearings. The substructure will have the concrete abutments supported by driven H-piles. All equipment and work activities will be within the designated limits of work and the stream will be protected with erosion and sediment controls. No in-stream work will be permitted. All equipment and materials will be moved to the top of the stream bank during anticipated storm events.

The work area near the stream is provided to give the Contractor enough space for the large equipment that will be needed to set the new bridge in place. Depending on the means and methods, this space can be used for crane placement or to construct a temporary support if the bridge is installed in segments. If the Contractor determines that he needs to set up a crane in this area, it will only be there long enough to set the new bridge in place. Once the equipment is no longer needed, it will be removed and the area will be restored to its original condition. At no point will the Contractor be allowed to set equipment or construct temporary supports outside of the designated LOW.

Tree removal and protection details are included in the construction plans. Trees that are in direct conflict with the proposed bridge abutment and riprap slope protection will be removed. All other trees in the work area will be protected with chain link tree protection fence.

The total regulated land disturbance for the proposed improvement is 4,567 SF, which is greater than the 2,500 SF limit. Therefore, to comply with the VSMP requirements, the stormwater management plan is required to be developed for the project. Based on the Part IIB Technical Criteria, the Total Phosphorus generated by the proposed improvements and that needs to be treated is calculated using the VRRM spreadsheet. The total phosphorus load reduction required for the project is 0.03 lb/yr. The water quality requirements of the VSMP will be achieved through the purchase of nutrient credits. The whole disturbance is located within the Arlington County Right of Way; therefore, the County will use its own nutrient credits available in its database. The stormwater from the disturbed area is discharged into the Four Miles Run. One percent rule is used to meet the water quantity requirements of the VSMP. The regulated land disturbance for the project is 4,567 SF (0.105 ac), which is less than 1% of the total drainage area that drains into the stream immediately upstream of the bridge (8,064 ac). The outfall points are also located within the FEMA regulated floodplain; therefore, the water quantity requirement of the VSMP for the project is met at the project site using the one percent rule.

WATER QUALITY DISCUSSION

The proposed improvement will generate the Total Phosphorus, which will need to be treated using the VRRM spreadsheet to calculate the Total Phosphorus load reduction. As discussed in the previous section, the water quality requirements will be met through the purchase of nutrient credits where Arlington County will use its own nutrient credits available in its database.

EROSION AND SEDIMENT CONTROL

E&C is limited to placement of sod.

Additional Water Quality Impact Assessment Information

The information supplied on this form satisfies the minimum requirements for a Minor Water Quality Impact Assessment. For projects that disturb over 2500 square feet, elements of a Major Water Quality Impact Assessment may also be required, depending on the nature and extent of the proposed RPA encroachment, as outlined in Section 61-12 of the ordinance.

NOT FOR CONSTRUCTION
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ARLINGTON VIRGINIA

Approved: 10/3/2022
Subject to field inspection
LDA22115

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CONSTRUCTION MANAGEMENT SUPERVISOR	10/13/22
WATER/SEWER, STREETS BUREAU CHIEF	10/5/22
TRANSPORTATION DIRECTOR	10/5/22
PROJECT MANAGER	9/27/2022

REVISIONS	DATE

SHIRLINGTON ROAD PEDESTRIAN BRIDGE
BR02
SHIRLINGTON ROAD

WATER QUALITY IMPACT ASSESSMENT
DATA SHEET

DESIGNED: BD
DRAWN: BD
CHECKED: BG

PLOTTED: AUGUST 30 2022

SCALE:

0 25 50
GRAPHIC SCALE

C081.3

REVISED ON 1/24/2022

FILENAME: BR02-120-2D_TREE INVENTORY.DWG PATH: T:\1009400 - MASTER-ARLINGTON COUNTY ON-CALL\1009450 - SHIRLINGTON RD PEDESTRIAN BRIDGE\07 DESIGN\DWG PLOTTED BY: DORIELLE.BRASHEARS

D1
Bradford Pear
Pyrus calleryana 'Bradford'
24" DBH

Good Condition
Priority 4
NOTES: Excellent condition tree. Highest priority for

D2
Black Locust
Robinia pseudoacacia
6" DBH

Poor Condition
Priority 2
NOTES: Poor condition tree will not be missed, not worth special protection measures.

D3
Black Locust
Robinia pseudoacacia
6" DBH

Fair Condition
Priority 3
NOTES: Fair condition tree well worth protecting though not uniquely valuable.

D4
American Sycamore
Platanus occidentalis
8" DBH

Poor Condition
Priority 2
NOTES: Poor condition tree will not be missed, not worth special protection measures.

D5
Silver Maple
Acer saccharinum
6" DBH

Poor Condition
Priority 2
NOTES: Poor condition tree will not be missed, not worth special protection measures.

D6
American Sycamore
Platanus occidentalis
18" DBH

Good Condition
Priority 4
NOTES: Excellent condition tree. Highest priority for protection.Should be protected at all costs. Prune branches to avoid damage during bridge span installation.

D7
American Sycamore
Platanus occidentalis
18" DBH

Fair Condition
Priority 3
NOTES: Fair condition tree well worth protecting though not uniquely valuable. Prune branches to avoid damage during bridge span installation.

D8
American Sycamore
Platanus occidentalis
12" DBH

Good Condition
Priority 4
NOTES: Excellent condition tree. To be removed due to proximity to limit of disturbance.

D9
Catalpa
Catalpa speciosa
8" DBH

Good Condition
Priority 4
NOTES: Excellent condition tree. Highest priority for protection.Should be protected at all costs.

D10
American Elm
Ulmus americana
12" DBH

Poor Condition
Priority 2
NOTES: Poor condition tree will not be missed, not worth special protection measures.

D11
Catalpa
Catalpa speciosa
12" DBH

Good Condition
Priority 4
NOTES: Excellent condition tree. Highest priority for protection.Should be protected at all costs. Prune branches to avoid damage during bridge span installation.

TREE PROTECTION FENCE

EXISTING ROADWAY BRIDGE
WITH NARROW SIDEWALK

LEGEND

&##
Common Name
Latin name
X" DBH
TYPE Condition
Priority #
NOTES

TREE TAG

CRITICAL ROOT ZONE

STRUCTURAL CRITICAL ROOT ZONE

NOTES:

1. TREES MAY NOT BE IN THESE EXACT LOCATIONS AS SHOWN. ADDITIONAL CLEARING SHALL RESULT IN AN UPDATE TO THE PLAN AND TREE REPLACEMENT QUANTITIES. DETERMINED WHEN THE LOW IS LAID OUT IN FIELD.
2. TREE INVENTORY INCLUDES EXISTING TREES 6" IN CALIPER OR GREATER THAT ARE CLOSER THAN 25 FEET FROM THE PROPOSED PEDESTRIAN BRIDGE.
3. PROPOSED PLANTINGS ON THE NORTH SIDE OF FOUR MILE RUN IS BY OTHERS.
4. SEE SHEET LANDSCAPE PLAN AND DETAILS FOR NEW TREE PLANTINGS AS PART OF THIS CONTRACT.
5. PRUNING FOR TREES D6, D7, AND D11 SHALL BE DETERMINED IN THE FIELD BY THE CONTRACTOR AND APPROVED BY COUNTY URBAN FORESTRY. REMOVAL OF ANY TREE NOT LISTED ON THIS SHEET SHALL REQUIRE APPROVAL FROM COUNTY URBAN FORESTRY. ADDITIONAL REMOVAL OF TREES AND REPLACEMENT VALUE SHALL BE THE SAME AS THE OTHER TREES ON THIS PROJECT.

Priority - this is meant to capture a tree's "priority for preservation" relating to tree preservation planning on development projects. The tree is rated using it's condition as a guide, but assesor also takes into account other factors, such as: species desireability, species longevity, uniqueness, aesthetics both of the tree itself and it's relation to the site and other factors as seen fit. This is meant to be a qualitative rating based solely on the site at the time of the inventory (and does not account for any proposed plans).

- Priority 4 = highest priority for protection (i.e. particularly good condition, unique tree and/or should be protected at all reasonable cost).
- Priority 3 = high fair condition tree well worth protecting though not uniquely valuable.
- Priority 2 = poor condition average tree that will not be missed if it were gone, not worth any special protection measures.
- Priority 1 = trees that should be removed under most any curcumstances (invasive/undesireable species, poor or dead trees, particularly high risk situations, etc).

VCS 1983

N

NO ENTRY
TREE PRESERVATION AREA
CALL: 703-228-6557
TO REPORT VIOLATIONS

PROHIBIDO ENTRAR
ZONA DE PROTECTION DEL ARBOL
LLAMAR AL TEL. 703-228-6557
PARA REPORTAR INFRACCIONES

12"
8"

SIGN ENLARGEMENT
2" = 1'-0"

TYPICAL SIGNAGE
30' O.C.
(SEE ENLARGEMENT)

2" CHAIN LINK FABRIC

PIPE 2" O.D. GALVANIZED STEEL

TENSION BAR AT ENDS

6'-0" MIN.

10'-0" MAX.

2'-0" MIN. DEPTH

ELEVATION

NOTES:
1. TREE PROTECTION FENCE (TPF) SHALL BE INSTALLED PRIOR TO ANY SITE WORK, CLEARING OR DEMOLITION. ARLINGTON COUNTY URBAN FORESTER SHALL BE NOTIFIED 72 HOURS PRIOR TO INSTALLATION OR ANY OTHER TREE PRESERVATION MEASURE SPECIFIED IN PLANS AND SHALL APPROVE LAYOUT.
2. NO PERSONNEL, VEHICLES, EQUIPMENT, CONSTRUCTION MATERIALS OR DEBRIS ALLOWED IN TREE PROTECTION AREAS WITHOUT WRITTEN CONSENT OF ARLINGTON COUNTY URBAN FORESTER.
3. REMOVE TPF ONLY WITH APPROVAL FROM ARLINGTON COUNTY URBAN FORESTER AFTER ALL SITE WORK HAS BEEN COMPLETED.
4. SIGN MATERIAL TO BE WEATHER RESISTANT.

6' CHAIN LINK TREE PROTECTION FENCE
311300.1 (2016) (02231.1)

1/2" = 1'-0"

ARLINGTON DPR

TREE PRESERVATION AND REMOVAL TABLE

	Preserve or Remove	Tree #	DBH (Inches)	CRZ (Feet)	S-CRZ (Feet)	Condition Rating %	Species	Common name	Species Rating	Replacement Value	Replacements	Priority (1-4)	Comments
LANDSCAPE PLAN - 1	**Remove**	**D01**	**20**	**20**	**5**	**90%**	**Pyrus calleryana 'Bradford'**	**Bradford Pear**	**80**	**14.4**	**3**	**4**	
	Remove	**D02**	**8**	**12**	**5**	**30%**	**Robinia pseudoacacia**	**Black Locust**	**50**	**1.2**	**1**	**2**	
	Remove	**D03**	**8**	**12**	**5**	**60%**	**Robinia pseudoacacia**	**Black Locust**	**50**	**2.4**	**1**	**3**	
	Remove	**D04**	**12**	**12**	**7**	**30%**	**Platanus occidentalis**	**American Sycamore**	**70**	**2.52**	**1**	**2**	
	Remove	**D05**	**8**	**12**	**5**	**30%**	**Acer saccharinum**	**Silver Maple**	**60**	**1.44**	**1**	**2**	
	Preserve	**D06**	**18**	**18**	**5**	**90%**	**Platanus occidentalis**	**American Sycamore**	**70**			**4**	**See Note Above**
	Preserve	**D07**	**18**	**18**	**5**	**60%**	**Platanus occidentalis**	**American Sycamore**	70			3	**See Note Above**
	Remove	**D08**	**12**	**12**	**9**	**90%**	**Platanus occidentalis**	**American Sycamore**	70	**7.56**	**2**	4	
	Preserve	**D09**	**8**	**12**	**5**	**90%**	**Catalpa speciosa**	**Catalpa**	60			4	
	Preserve	**D10**	**12**	**12**	**0**	30%	**Ulmus americana**	**American Elm**	70			2	
	Preserve	**D11**	**12**	**12**	**0**	90%	**Catalpa speciosa**	**Catalpa**	60			4	**See Note Above**
										TOTAL	9		

0 25 50
HORIZ. SCALE

ARLINGTON VIRGINIA

Approved: 10/3/2022
Subject to field inspection
LDA22115

ARLINGTON VIRGINIA

DEPARTMENT OF ENVIRONMENTAL SERVICES
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ENGINEERING BUREAU
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ARLINGTON, VA 22201
PHONE: 703.228.3629
FAX: 703.228.3606

SEAL

COMMONWEALTH OF VIRGINIA
OLIVER BOEHM
No. 1168
05-19-2022
LANDSCAPE ARCHITECT

APPROVALS	DATE
DESIGN TEAM ENGINEER SUPERVISOR	9/28/2022
CONSTRUCTION MANAGEMENT SUPERVISOR	10/13/22
WATER, SEWER, STREETS BUREAU CHIEF	10/5/22
TRANSPORTATION DIRECTOR	10/5/22
PROJECT MANAGER	9/27/2022

REVISIONS	DATE

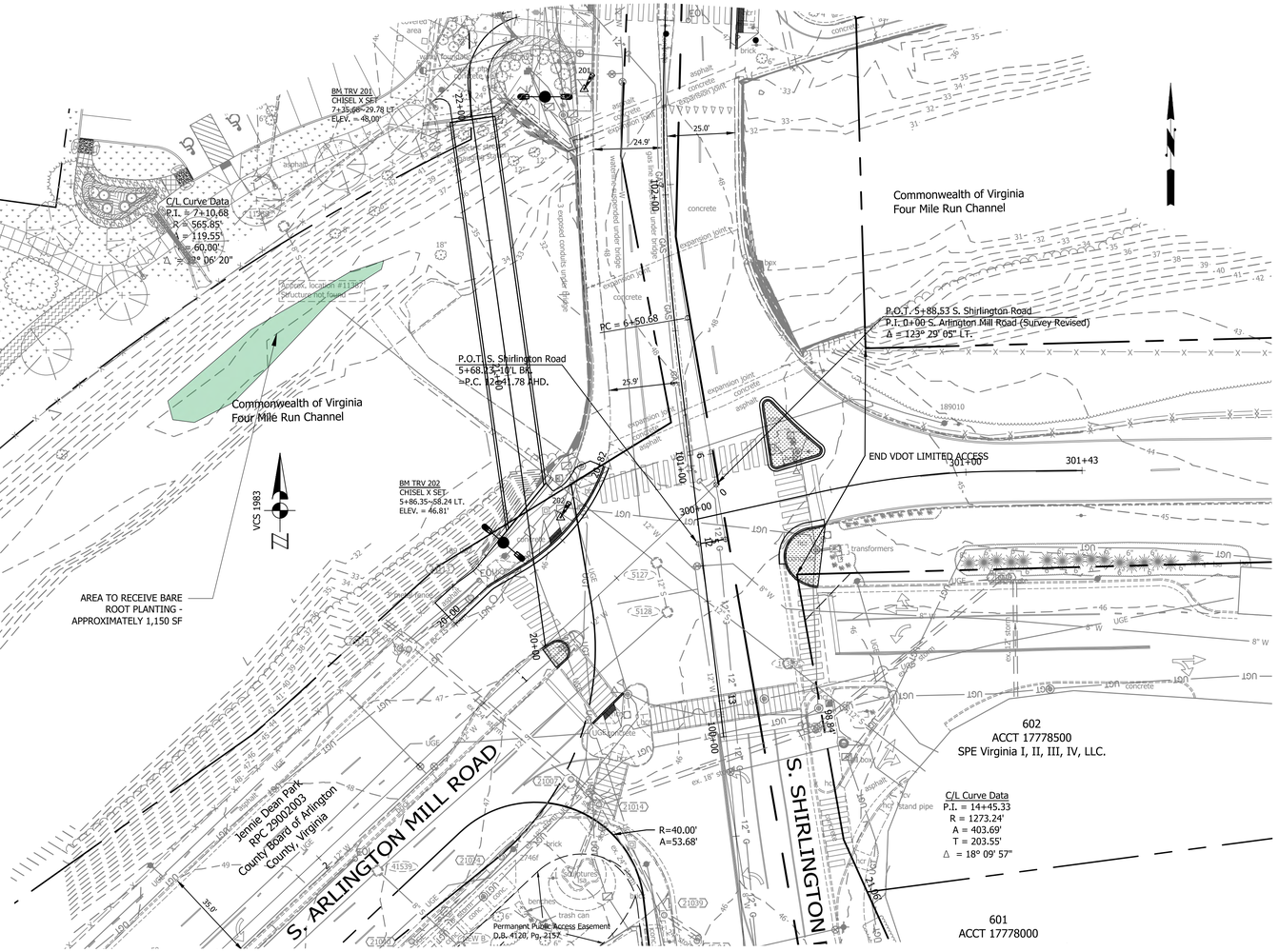
SHIRLINGTON ROAD PEDESTRIAN BRIDGE
BR02
SHIRLINGTON ROAD
TREE INVENTORY

DESIGNED: DB
DRAWN: DB
CHECKED: OB

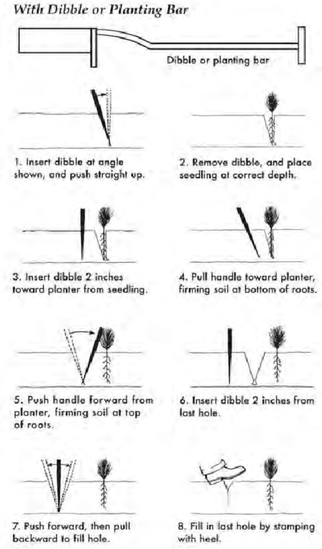
PLOTTED: AUGUST 31 2022

SCALE:

C091.1



CONTRACTOR SHALL FOLLOW THE HAND PLANTING TECHNIQUE SHOWN BELOW FOR THE INSTALLATION OF BARE ROOT PLANTING:



THE CONTRACTOR SHALL PLANT SEEDLINGS IN MIXED SPECIES CLUSTERS OF 6 - 10. TREE REPLACEMENT VALUE FOR THIS PROJECT SHALL BE 1:10. THE TABLE BELOW SHOWS THE TREE PLANTINGS FOR THIS PROJECT.

SPECIES	COMMON NAME	NUMBER OF TREES
Salix nigra	Black Willow	14
Acer negundo	Boxelder Maple	11
Platanus occidentalis	American Sycamore	20
Celtis occidentalis	Hackberry	20
Acer saccharinum	Silver Maple	9
Betula nigra	River Birch	9
Juglans nigra	Eastern Black Walnut	7
	Total	90

NOTES:

1. TREE PLANTINGS SHALL BE INSTALLED RANDOMLY THROUGHOUT THE PLANTING AREA SHOWN IN PLAN.
2. TREE PLANTINGS SHALL BE 12 INCHES TO 24 INCHES IN SIZE AND SPACED 4' TO 5' O.C.
3. CONTRACTOR SHALL PROVIDE A PLANTING PLAN DIAGRAM PRIOR TO INSTALLATION TO THE OWNER FOR APPROVAL.
4. CONTRACTOR SHALL PLANT ROOT SYSTEM DEEP ENOUGH FOR THE PLANT TO BE STRAIGHT AND ROOTS ARE NOT CURLED IN THE PLANTING HOLE. LIFT TREE UP IN THE HOLE SO THE ROOT COLLAR IS SLIGHTLY BELOW THE SOIL LEVEL.
5. DO NOT BEND THE ROOTS WHILE PLANTING. CONTRACTOR SHALL ENSURE HOLE IS DEEP AND WIDE ENOUGH FOR THE ROOTS TO BE PLACED STRAIGHT DOWN. TREE SHALL BE PACKED FIRMLY IN THE SOIL. TEST PLANTING WITH A FIRM PULL. PULL SHALL NOT MOVE THE PLANT.
6. PLANTING SHALL BE DONE WHEN GROUND CONDITIONS HAVE GOOD SOIL MOISTURE. AVOID PLANTING WHEN GROUND IS FROZEN. PLANTING PERIOD SHALL BE BETWEEN LATE DECEMBER AND EARLY APRIL UNLESS ANOTHER PLANTING PERIOD IS APPROVED BY OWNER.
7. CONTRACTOR SHALL PROVIDE A 1 YEAR WARRANTY FOR BARE ROOT PLANTINGS. WARRANTY PERIOD SHALL START ON THE DAY OF THE PLANTING, PROVIDED PLANTING IS ACCEPTED BY THE OWNER. AFTER 1 YEAR PERIOD, THE PLANTING WILL BE EVALUATED FOR FINAL ACCEPTANCE. ACCEPTABLE PLANTINGS SHALL BE DETERMINED BY 75% OF THE TREE SHOWING HEALTHY AND VIGOROUS GROWING HABITS.
8. CONTRACTOR SHALL REPLACE UNACCEPTABLE TREES WITH IN-KIND REPLACEMENTS.
9. LOCATION OF REFORESTATION TREES IS ILLUSTRATIVE ONLY. FINAL LOCATION TO BE DETERMINED IN FIELD AND APPROVED BY URBAN FORESTRY. THE CONTRACTOR SHOULD NOTE THAT TREES MAY NOT BE EXACTLY IN THESE LOCATIONS. CONTRACTOR SHALL BE RESPONSIBLE FOR ADDITIONAL TREE REPLACEMENTS IF CLEARING AND DISTURBANCE OCCURS OUTSIDE THE LIMIT OF WORK AS SHOWN IN THE PLANS.
10. CONTRACTOR SHALL NOT PERFORM ANY WORK INCLUDING SOIL PREPARATION OR SOIL INSTALLATION WITHIN CRITICAL ROOT ZONE OF TREES TO BE PRESERVED, EXCEPT WHERE APPROVED OR DIRECTED BY URBAN FORESTRY.

ARLINGTON VIRGINIA

Approved: 10/3/2022
Subject to field inspection
LDA22115

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SEAL

COMMONWEALTH OF VIRGINIA
OLIVER BOEHM
LANDSCAPE ARCHITECT
05-19-2022

APPROVALS	DATE
PESIGN TEAM ENGINEER SUPERVISOR	9/28/2022
CONSTRUCTION MANAGEMENT SUPERVISOR	10/13/22
WATER/SEWER, STREETS BUREAU CHIEF	10/5/22
TRANSPORTATION DIRECTOR	10/5/22
PROJECT MANAGER	9/27/2022

REVISIONS	DATE

SHIRLINGTON ROAD PEDESTRIAN BRIDGE
BR02
SHIRLINGTON ROAD

LANDSCAPE PLAN AND DETAILS

DESIGNED: DB
DRAWN: DB
CHECKED: OB

PLOTTED: JULY 13 2022

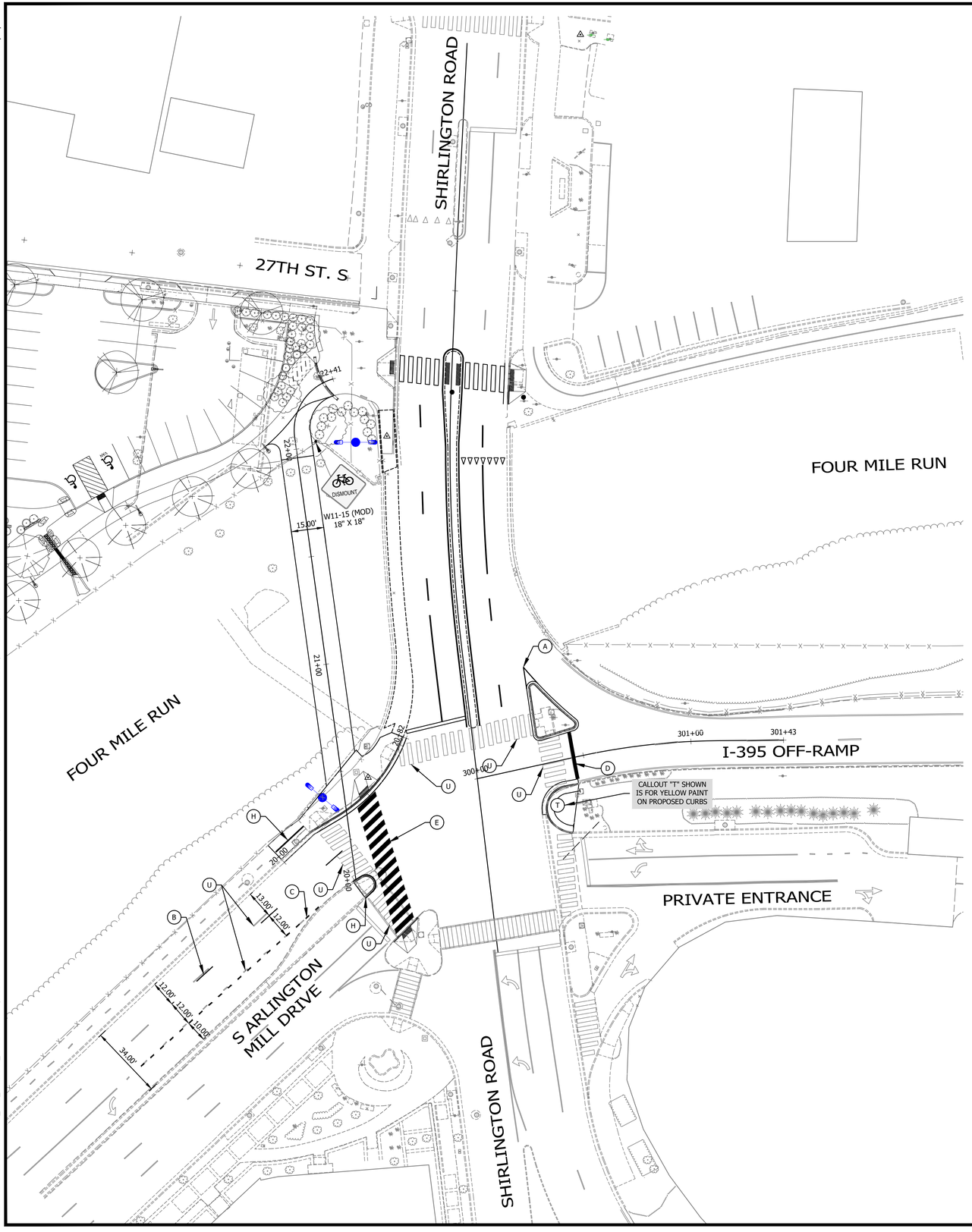
SCALE:

0 25 50
GRAPHIC SCALE

C091.2

REVISED ON 1/24/2022

FILENAME: BR02-214- LANDSCAPE_PLAN_AND_DETAILS.DWG PATH: T:\1009400 - MASTER-ARLINGTON COUNTY ON-CALL\1009450 - SHIRLINGTON RD PEDESTRIAN BRIDGE\07 DESIGN\DWG PLOTTED BY: BRENDA.DUONG

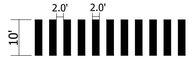


STANDARD PAVEMENT MARKING LEGEND

Ⓐ	TYPE B CLASS 1	WHITE 4" WIDTH	PARKING LANES, EDGE LINES, LANE LINES
Ⓑ	TYPE B CLASS 1	WHITE 4" WIDTH, 10' LONG, 30' SPACING	DASHED LANE LINES
Ⓒ	TYPE B CLASS 1	WHITE 4" WIDTH, 2' LONG 10' SPACING	LANE TRANSITIONS, TURN LANE SKIPS
Ⓓ	TYPE B CLASS 1	WHITE 18" WIDTH	STOP BARS
Ⓔ	TYPE B CLASS 1	WHITE 24" WIDTH	CONTINENTAL CROSS WALKS
Ⓕ	TYPE B CLASS 1	WHITE 6" WIDTH	TURN LANES, TRANSVERSE CROSS WALKS, BIKE LANES
Ⓖ	TYPE B CLASS 1	YELLOW 4" WIDTH, 10' LONG, 30' SPACING	DIVIDED TRAFFIC, TWO WAY TURN LANES
Ⓗ	TYPE B CLASS 1	YELLOW 4" WIDTH	EDGE LINES
Ⓘ	TYPE B CLASS 1	YELLOW 4" WIDTH, DOUBLE LINE, 4" SPACING	CENTERLINES
Ⓙ	TYPE B CLASS 1	WHITE 6" WIDTH, 10' SPACING @45 DEGREE	HATCH LINES, SAFETY ZONES
Ⓚ	TYPE B CLASS 1	WHITE SINGLE ARROW	TURN LANES
Ⓛ	TYPE B CLASS 1	WHITE COMBINATION ARROW	TURN LANES
Ⓜ	TYPE B CLASS 1	WHITE 8' LETTERS	PAVEMENT LETTERS (STOP, YIELD, BUS, ONLY, etc.)
Ⓝ	TYPE B CLASS 1	WHITE 6" WIDTH, 2' LONG, 10' SPACING	LANE TRANSITIONS, TURN LANE SKIPS
Ⓞ	TYPE B CLASS 1	WHITE 12" WIDTH, 20' SPACING @45 DEGREE	GORE MARKINGS
Ⓟ	TYPE B CLASS 1	YELLOW 8" WIDTH @45 DEGREE	GORE MARKINGS
Ⓠ	TYPE B CLASS 1	WHITE 6" WIDTH, 2' LONG, 4' SPACING	LANE TRANSITIONS
Ⓡ	TYPE B CLASS 1	WHITE 4" WIDTH, DOUBLE LINE, 4' SPACING	CURB EXTENSIONS
Ⓢ	TYPE B CLASS 1	WHITE 24" WIDTH	VDOT - STOP BARS
Ⓣ	TYPE A	YELLOW 4" WIDTH	EDGE LINES
Ⓤ	ERADICATION OF EXISTING PAVEMENT MARKINGS THROUGH MILLING AND OVERLAY OPERATION		

SIGN AND PAVEMENT MARKING NOTES:

1. STREET WIDTH MEASUREMENTS ARE FROM FACE OF CURB TO FACE OF CURB. LANES ARE MEASURED FROM CENTER OF MARKING TO CENTER OF MARKING.
2. CONTACT DES-TRANSPORTATION ENGINEERING & OPERATIONS CONSTRUCTION MANAGEMENT SPECIALIST OR HIS DESIGNEE AT 703-228-6598 OR 571-437-1077 TO APPROVE MARKING LAYOUT 48 HOURS PRIOR TO INSTALLATION OF MARKINGS.
3. PAVEMENT MARKINGS TO BE IN ACCORDANCE WITH THE FOLLOWING AND ANY REVISIONS HERE TO:
   A. THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.
   B. ARLINGTON COUNTY MARKING STANDARDS.
4. ALL MARKINGS SHALL BE THERMOPLASTIC PER ARLINGTON COUNTY MARKING STANDARDS UNLESS OTHERWISE NOTED.
5. STOP BARS SHALL BE A MINIMUM OF 4' IN ADVANCE OF A MARKED CROSSWALK. IF THERE IS NO MARKED CROSSWALK, STOP BAR SHALL BE NO MORE THAN 30' FROM THE NEAREST EDGE OF THE INTERSECTED TRAVELED WAY.
6. CROSSWALKS SHALL BE 10' WIDE UNLESS OTHERWISE NOTED.
7. LEFT TURN ARROWS SHALL BE LOCATED 25' BACK FROM STOP BAR. FOR ADDITIONAL ARROWS FOLLOW COUNTY MARKING STANDARDS.
8. ON-STREET PARKING LANE IS 7' WIDE (UNLESS OTHERWISE NOTED) AND MARKED WITH 4" WIDE WHITE LINES. BEGINNING AND END OF PARKING SHALL BE MARKED WITH AN END LINE PERPENDICULAR TO CURB EXCEPT AT NUBS OR WHERE OTHERWISE INDICATED.
9. SHARED LANE MARKINGS SHALL BE PLACED IN CENTER OF LANE, 250' APART UNLESS OTHERWISE SPECIFIED.
10. BIKE LANE SYMBOLS TO BE PLACED 330' APART UNLESS OTHERWISE SPECIFIED.
11. EDGE LINES ARE ONLY REQUIRED WHERE SHOWN ON THE PLANS.
12. FOR DETAILS SEE ARLINGTON COUNTY PAVEMENT MARKING SPECIFICATION, DETAILS MK-1 TO MK-12
13. THE ERADICATION OF PAVEMENT MARKING SHALL BE PERFORMED BY GRINDING, BLASTING OR A COMBINATION THEREOF. GRINDING SHALL BE LIMITED TO REMOVAL OF MATERIAL ABOVE THE PAVEMENT SURFACE EXCEPT WHEN REMOVING THERMOPLASTIC AND PREFORMED TAPE MARKINGS, WHICH MAY BE REMOVED BY GRINDING ALONE. BLASTING SHALL BE USED ON THE BRIDGE DECK TO REMOVE ALL OTHER TYPES OF MARKINGS.



HIGH VISIBILITY CROSSWALK
NOT TO SCALE

STRIPING LEGEND

Ⓐ EXISTING STRIPING

Ⓐ PROPOSED STRIPING

LEGEND

EXISTING		PROPOSED
	BUS STOP	
	FIRE HYDRANT	
	PARKING METER	
	SIGN	

ARLINGTON VIRGINIA

Approved: 10/3/2022
Subject to field inspection
LDA22115

ARLINGTON VIRGINIA
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SEAL

COMMONWEALTH OF VIRGINIA
HARSHIT THAKER
Lic. No. 049174
05-19-2022
PROFESSIONAL ENGINEER

APPROVALS	DATE
DESIGN TEAM ENGINEER SUPERVISOR	9/28/2022
CONSTRUCTION MANAGEMENT SUPERVISOR	10/13/22
WATER/SEWER, STREETS BUREAU CHIEF	10/5/22
TRANSPORTATION DIRECTOR	10/5/22
PROJECT MANAGER	9/27/2022

REVISIONS	DATE

SHIRLINGTON ROAD PEDESTRIAN BRIDGE
BR02
SHIRLINGTON ROAD

SIGN AND MARKING PLAN

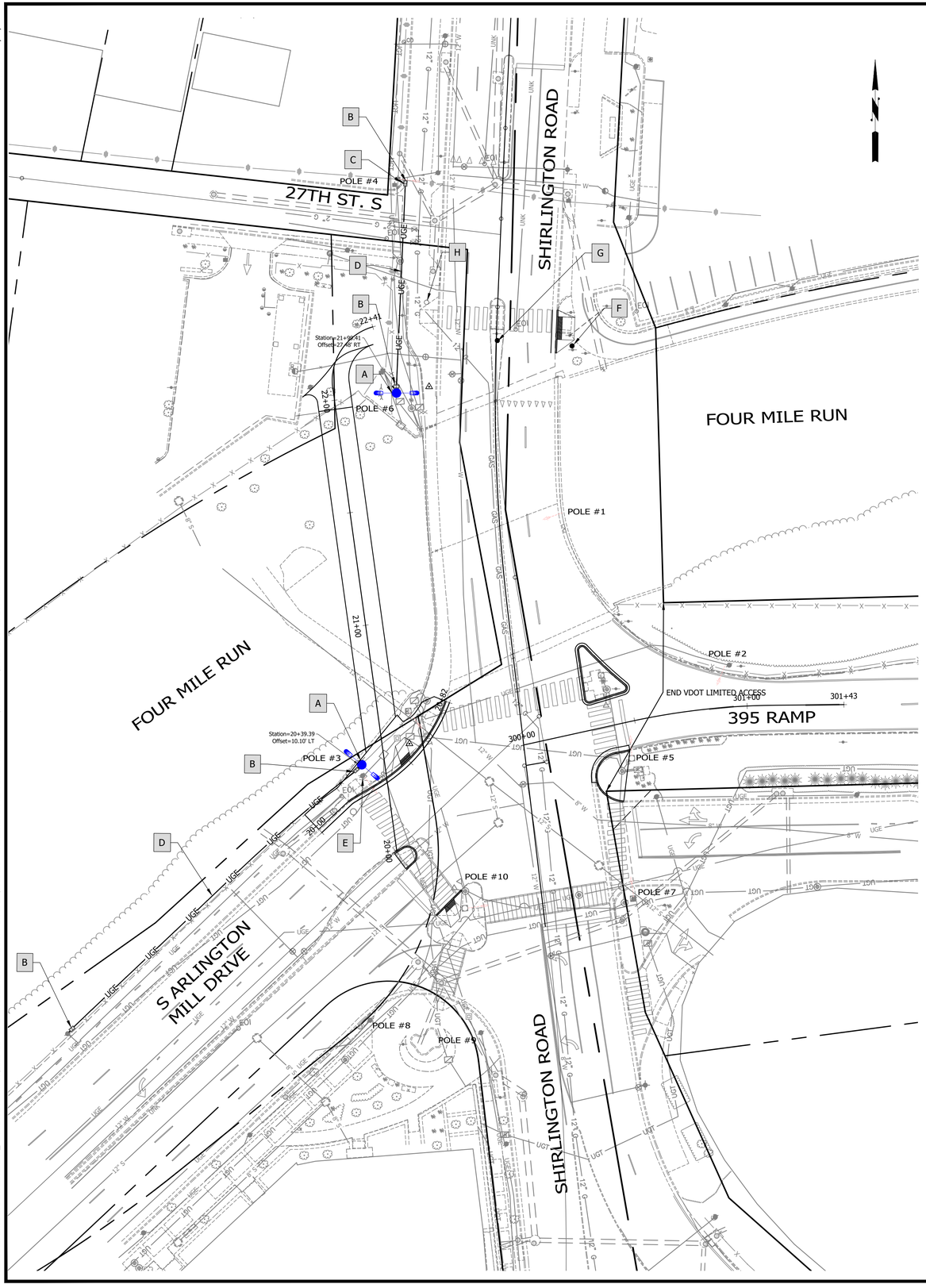
DESIGNED: JS
DRAWN: JS/AG
CHECKED: HT

PLOTTED: JULY 13 2022

SCALE:

0 25 50
HORIZ. SCALE

C101.1



STREETLIGHT KEY NOTES:

- A — PROPOSED LIGHT POLE WITH UPSWEEP LUMINAIRE ARMS, DOUBLE COBRA HEAD LED LUMINAIRES (BY OTHERS).
- B — CONTRACTOR SHALL FURNISH AND INSTALL DOMINION ENERGY'S SPLICE BOX (CU# SBOX24 STOCK# 42086295) AS SHOWN ON PLAN.
- C — CONTRACTOR SHALL FURNISH AND INSTALL 2" SCHEDULE 80 HDPE/SDR11 (FOR DIRECTIONAL BORING APPLICATIONS) ELECTRICAL CONDUIT PER ARL STD 14030-01.
- D — CONTRACTOR SHALL FURNISH AND INSTALL 2" SCHEDULE 40 PVC (FOR OPEN TRENCH APPLICATION) ELECTRICAL CONDUIT PER ARL STD 14030-01.
- E — REMOVE EXISTING HPS COBRA HEAD LUMINAIRE, LUMINAIRE ARM, TRANSFORMER BASE, STREETLIGHT POLE AND FOUNDATION (BY OTHERS).
- F — RELOCATE EXISTING RECTANGULAR RAPID-FLASHING BEACON (RRFB) POLE WITH TRANSFORMER BASE AS SHOWN ON PLAN.
- G — PROPOSED BACK-TO-BACK RECTANGULAR RAPID-FLASHING BEACON (RRFB) WITH POLE AND TRANSFORMER BASE.
- H — EXISTING RECTANGULAR RAPID-FLASHING BEACON (RRFB) POLE WITH TRANSFORMER BASE TO REMAIN.

ELECTRICAL GENERAL NOTES:

1. CONTRACTOR TO FIELD VERIFY (TEST PIT) EXACT LOCATION AND DEPTH OF PROPOSED UTILITY.
2. CONDUITS RUNS ARE APPROXIMATE ONLY, FIELD LOCATE ALIGNMENT. BOX LOCATIONS ARE APPROXIMATE ONLY, FIELD LOCATE PLACEMENT.
3. SIDEWALK PAVEMENT AND LANDSCAPING WITHIN PROPOSED AND REMOVED TRAFFIC SIGNAL STRUCTURES AND ELECTRICAL/COMMUNICATION UTILITY CUTS SHALL BE RESTORED TO COMPLY WITH EXISTING CONDITIONS OR PROPOSED PAVEMENT/LANDSCAPING.

POLE SCHEDULE

POLE TYPE	STANDARD # (COUNTY ONLY)	QUANTITY	MATERIAL	HEIGHT	COLOR	FOUNDATION TYPE	STOCK NUMBER (DOMINION ONLY)
ROADWAY		2	FIBERGLASS	30'	GRAY RAL-7038	DIRECT EMBEDDED	50502300

ARM SCHEDULE

ARM TYPE	STANDARD # (COUNTY ONLY)	QUANTITY	MATERIAL	LENGTH	COLOR	STOCK NUMBER (DOMINION ONLY)
UPSWEEP		4	ALUMINUM	6'	NATURAL ALUMINUM	42021269

LUMINAIRE SCHEDULE

LUMINAIRE TYPE	STANDARD # (COUNTY ONLY)	DRAWING SYMBOL	QUANTITY	WATTAGE	CCT	HOUSING COLOR	DISTRIBUTION TYPE	STOCK NUMBER (DOMINION ONLY)
LED COBRA			4	41W **	4000K	GRAY	TYPE III	42315897

*** 100W HID EQUIVALENT*

NOTE: POLES, ARMS AND LUMINAIRES TO BE PROVIDED AND INSTALLED BY DOMINION ENERGY.

ARLINGTON VIRGINIA

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SEAL

COMMONWEALTH OF VIRGINIA
HARSHIT THAKER
Lic. No. 049174
05-19-2022
PROFESSIONAL ENGINEER

APPROVALS	DATE
DESIGN TEAM ENGINEER SUPERVISOR	9/28/2022
CONSTRUCTION MANAGEMENT SUPERVISOR	10/13/22
WATER/SEWER, STREETS BUREAU CHIEF	10/5/22
TRANSPORTATION DIRECTOR	10/5/22
PROJECT MANAGER	9/27/2022

REVISIONS	DATE

SHIRLINGTON ROAD PEDESTRIAN BRIDGE
BR02
SHIRLINGTON ROAD

STREETLIGHT PLAN

DESIGNED: JS
DRAWN: JS
CHECKED: HT

PLOTTED: JULY 13 2022

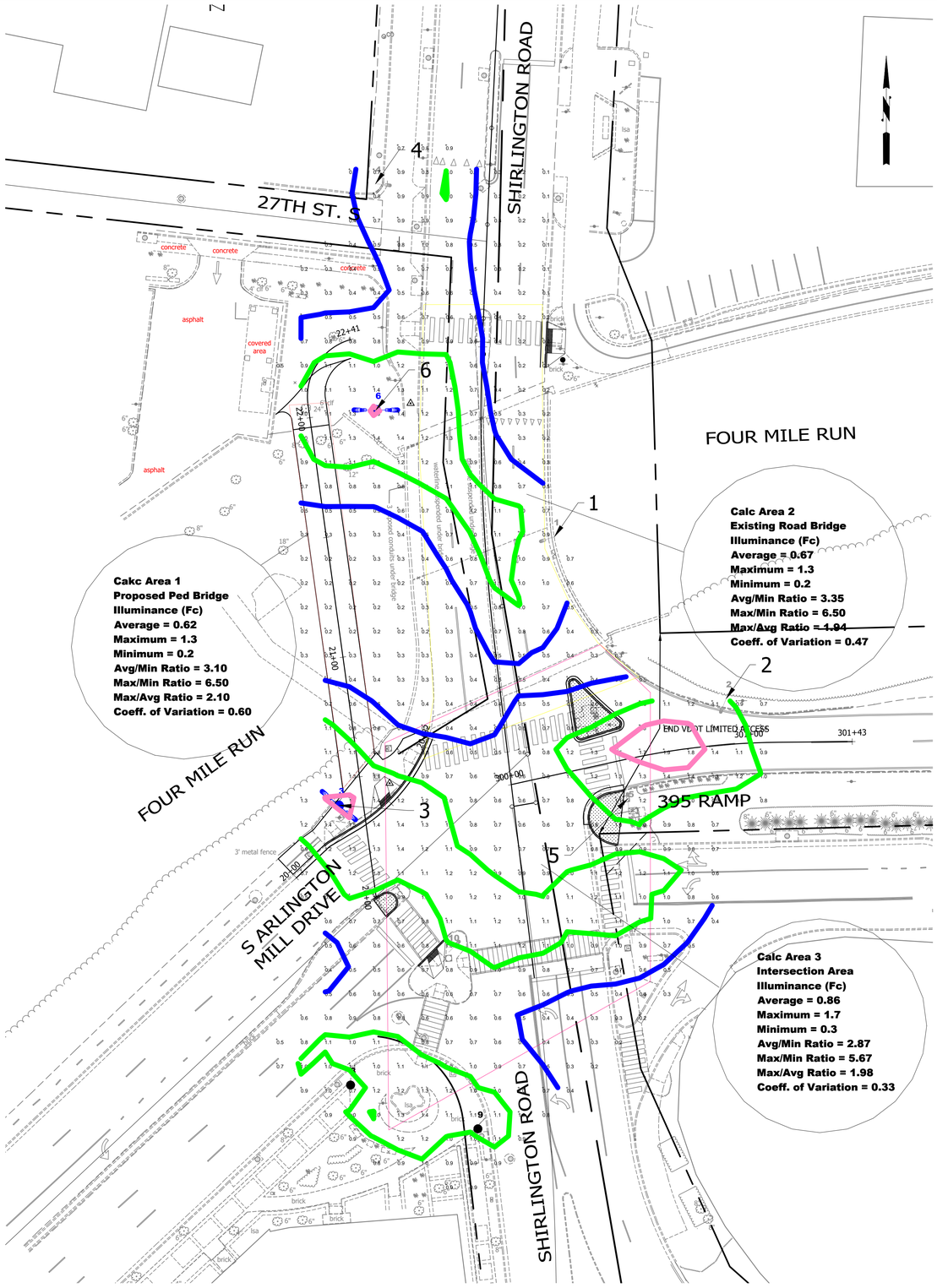
SCALE:

0 25 50
GRAPHIC SCALE

C111.1

REVISED ON 1/24/2022

FILENAME: BR02-270-STREETLIGHT_PLAN.DWG PATH: T:\1009400 - MASTER-ARLINGTON COUNTY ON-CALL\1009450 - SHIRLINGTON RD PEDESTRIAN BRIDGE\07 DESIGN\DWG PLOTTED BY: BRENDA.DUONG



Luminaire Schedule					
Project: Project_1					
Symbol	Qty	Arrangement	LLF	Description	Arr. Watts
	6	SINGLE	0.950	Existing Single Cobra Head	45
	2	BACK-BACK	0.950	Proposed Twin Cobra Head	90
	2	SINGLE	1.000	Existing Single Carlye	68

Calculation Summary								
CalcType	Units	Avg	Max	Min	Avg/Min	Max/Min	Max/Avg	Description
Illuminance	Fc	0.76	1.9	0.1	7.60	19.00	2.50	
Illuminance	Fc	0.62	1.3	0.2	3.10	6.50	2.10	Proposed Ped Bridge
Illuminance	Fc	0.67	1.3	0.2	3.35	6.50	1.94	Existing Road Bridge
Illuminance	Fc	0.86	1.7	0.3	2.87	5.67	1.98	Intersection Area

Luminaire Location Summary					
LumNo	X	Y	Z	Orient	Tag (Qty)
1	11885746	6993253	30	199.058	Existing Cobra Head Single (1)
2	11885817	6993186	30	247.751	Existing Cobra Head Single (1)
3	11885656.86	6993141.847	30	319.399	Proposed Cobra Head Twin (2)
4	11885672	6993399	30	353.454	Existing Cobra Head Single (1)
5	11885776.687	6993140.519	30	94.825	Existing Cobra Head Single (1)
6	11885672.114	6993305.37	30	0	Proposed Cobra Head Twin (2)
7	11885778.307	6993084.639	30	97.245	Existing Cobra Head Single (1)
8	11885661.66	6993026.071	16	132.57	Existing Single Carlye (1)
9	11885714.303	6993007.968	16	2.725	Existing Single Carlye (1)
10	11885702.337	6993081.099	30	46.049	Existing Cobra Head Single (1)

NOTES:

POWER SOURCE AND VOLTAGE DROP CALCULATION WILL BE PROVIDED AT NEXT MILESTONE.

ARLINGTON VIRGINIA

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WATER/SEWER, STREETS BUREAU CHIEF	10/5/22
TRANSPORTATION DIRECTOR	10/5/22
PROJECT MANAGER	9/27/2022

REVISIONS	DATE

SHIRLINGTON ROAD PEDESTRIAN BRIDGE
BR02
SHIRLINGTON ROAD

STREETLIGHT PHOTOMETRIC DATA

DESIGNED: BD
DRAWN: BD
CHECKED: BG

PLOTTED: JULY 13 2022

SCALE:

0 25 50
GRAPHIC SCALE

C111.2

REVISED ON 1/24/2022

FILENAME: C111.2 STREETLIGHT PHOTOMETRIC CALCULATION.DWG PATH: T:\1009400 - MASTER\ARLINGTON COUNTY ON-CALL\1009450 - SHIRLINGTON RD PEDESTRIAN BRIDGE\07 DESIGN\DWG PLOTTED BY: BRENDA.DUONG

TRANSPORTATION MANAGEMENT PLAN (TMP)
(TYPE A - CATEGORY I)

Temporary Traffic Control Plan Notes

GENERAL NOTES:

1. TMP Type A Project Information:
   a. Identify the project's TMP Type:
   This project's TMP plan has been designed in conformance with Type A TMP plan.

   b. Identify the work zone location, length, and width:
   The project location and work zone areas have been delineated as shown on the MOT plan sheet C121.1.
   The work zone lengths and widths vary as shown on this sheet.

   c. Note the hours Construction Areas will be active:
   Construction areas shall be considered active when any impact to traffic occurs, (1st cone in Road).
   Construction Areas hours have the following limitations:

   A.

VDOT R-O-W:	LANE CLOSURES (MAJOR ARTERIALS)			
	MON. TO THU.	FRIDAY	SATURDAY	SUNDAY
DAY TIME	9:30 AM TO 3:00 PM	9:30 AM TO 2:00 PM	*Not Allowed	*Not Allowed
NIGHT TIME	*Not Allowed	*Not Allowed	*Not Allowed	*Not Allowed

   B.

Arlington County R-O-W:	LANE CLOSURES (MINOR ARTERIAL)		
	MON. TO FRI.	SATURDAY	SUNDAY
DAY TIME	9:00 AM TO 4:00 PM	*Not Allowed	*Not Allowed
NIGHT TIME	*Not Allowed	*Not Allowed	*Not Allowed

   No lane closures will be allowed from noon on the day before a holiday until noon on the workday following the holiday. Holidays include all State and Federal holidays.

   d. The TMP plan during construction shall be in accordance with Sections 512, 701,703, & 704 of the Virginia Department of Transportation Road and Bridge Specifications, dated 2020, the Virginia Work Area Protection Manual (VWAPM) dated 2020, the Manual on Uniform Traffic Control Devices (MUTCD), dated 2009 and the Virginia Supplement in the 2009 MUTCD, dated 2011.

   e. Note any existing entrances, existing intersection, or existing pedestrian access points that will be affected by the Construction Area or by the traffic control devices.

   Existing Entrances:
   There is an existing driveway to EXXON gas station on northbound Shirlington Road between S Arlington Mill Drive and 27th St S within the project limit. This driveway entrance will not be impacted and to remain open during construction.

   Existing intersections:
   The project is generally located at NW quadrant of S Arlington Mill Drive and Shirlington Road for the proposed pedestrian bridge construction, and along S Arlington Mill Drive between Shirlington Road and S Quincy Street. All existing intersections are to remain open and functional during construction.

   Existing Pedestrian And Bicyclist Access Points:
   There are existing sidewalks, crosswalks and trail within the project limits. All existing pedestrian and bicyclists access points are to remain open during construction.

   Existing Bus Stops:
   There is an existing bus stop on northbound Shirlington Road north of 27th Street S and the Four Mile Run Trail. This bus stop will not be impacted and to remain open during construction.

   f. Identify the major types of travelers:
   The traffic on the roadway consists of passenger vehicles, buses and commercial/delivery trucks. The adjacent areas are both commercial businesses and residences.

   g. The contractor, at no additional cost to the project and which shall be considered incidental to the cost of the project :

   Designate a person assigned to the project who will have the primary responsibility, with sufficient authority, for implementing the TMP and other safety and mobility aspects of the permit work. This person shall coordinate with the Arlington County Construction Manager for the duration of construction.

   Ensure that personnel assigned to the project are trained in traffic control to a level commensurate with their responsibilities in accordance with VDOT's work zone traffic control training guidelines.

   Inform the Engineer of any work requiring lane shifts, lane closure, and/or phase changes a minimum of two working days prior to implementing this activity.

   Perform reviews of the Construction Area to ensure compliance with contract documents at regularly scheduled intervals at the direction of the Engineer. Contractors shall maintain a copy of the temporary traffic control plan at the work site at all times.

   Coordinate with Arlington County Police Department and Arlington County Fire/Rescue Department for all lane closures and detours of any nature, at no additional cost to the project.

   Schedule all phases of construction in such a manner that water, sanitary sewer, cable, fiber cable/optic cable; any overhanging utilities and any underground utilities services will not be interrupted.

2. This TMP/MOT/SOC plan is intended as a guide. It is not to enumerate every detail which must be considered in the construction of each phase, but only to show the general handling of existing traffic. If the contractor is to deviate from the approved TMP, a new or revised TMP must be submitted to the engineer for review and approval.

   Maintenance of Traffic (MOT) plan which include the Sequence of Construction (SOC) was reviewed and approved by Arlington County Transportation Engineering and Operation (TE&O). The MOT plan contained types of signages and barricades used, and recommended phases and Sequences of Construction. For MOT & SOC, see plan sheet C121.1.

   Each phase of construction shall be completed prior to the start of the next phase unless otherwise directed by the engineer.

3. Contractor shall maintain one lane of traffic at all times during construction of this project with a minimum clear roadway width no less than existing width, unless approved by the Engineer.

4. All areas excavated below the existing pavement surface and within the clear zone at the conclusion of each workday, shall be backfilled up to existing pavement or newly constructed pavement surface for the safety and protection of vehicular traffic. All costs for placing, maintaining and removing backfilled materials shall be included in the price bid for related items in the contract and no additional compensation will be allowed.

5. Contractor shall ensure positive drainage for the duration of the project. Contractor shall add any additional temporary measures necessary to facilitate proper, positive drainage for the duration of construction.

6. Unless specified on the plans, all existing turn lanes shall be maintained at all timers for the duration of the construction.

7. Where Group 2 Channelizing Devices are used to separate the Construction Area and traffic, a minimum clear zone areas as defined in the VWAPM is to be maintained.

8. IMPLEMENTING THE TRANSPORTATION MANAGEMENT PLAN

   During the first day of the new work zone traffic pattern, the project's Manager/Engineer and project's Construction Manager shall inspect the work zone to ensure compliance with the TMP. On the third to fifth day of implementation of the TMP's new work zone pattern, the Construction Manager shall conduct an on-site review of the work zone's performance in coordination with VDOT and recommend to the Contractor any required changes to the TMP to enhance the work zone's safety and mobility. All such changes shall be documented. An on-site review of the project's work zone traffic control by the County's Construction Manager and the Contractor shall be conducted (with coordination from VDOT) within 48 hours of any fatal incident/crash within the work zone.

9. PUBLIC COMMUNICATION PLAN

   The Contractor shall be responsible for:

   A. Notifying the Project Construction Manager and VDOT Field Engineer two weeks in advance of any scheduled work plan that may cause traffic delays.

   B. Notifying the Project Construction Manager and VDOT Field Engineer of any unscheduled traffic delays that may occur.

   C. Installing Portable Changeable Message Sign (PCMS) with project start date information approximately 500' before and after the project site limit three (3) weeks in advance prior to start of any roadwork and lane closure.

10. TRANSPORTATION OPERATIONS

    The contractor shall be responsible for implementing and providing the following:

    A. Notifying the VDOT Regional Transportation Operations Center (TOC) 48 hours in advance in order to place lane closure information on the 511 system and va-traffic.

    B. Post a list of local emergency response agencies inside the project's construction office/trailer or made readily available at the work site at all times.

    C. Immediately report any traffic incidents that may occur in the work zone.

    D. Notify the project's Construction Manager and corresponding VDOT Field Engineer of any incidents and expected traffic delays.

    E. Within 24 hours of any incidents within the construction work zone, a review of the traffic controls shall be implemented and necessary adjustments made to reduce the frequency and severity of any future accidents.

    CONTACTS NUMBERS:

    - Kamal Taktak - Construction Management Supervisor , DES - 703-228-7527
    - Scott Sedwick - DES Operation Manager, TE&O - 703-228-0650
    - Adil Chauhan - Assistant Bureau Chief, Engineering Bureau, DES - 703-228-7542
    - DES R-O-W Permitting Section - 703-228-4798
    - Arlington County Transit Bureau - 703-228-3049
    - Arlington County Water, Sewer and Street Operation - 703-228-6555
    - Arlington County Police - 703 -558-2222
    - Emegency Call - 911
    - VDOT Field Engineer - Mark Kaldmaa
    - VDOT's NRO (Northern Regional Operations) TOC - 703-877-3449

GENERAL CONSTRUCTION NOTE

1. The Contractor is to make any necessary adjustment during both working hours and non-working hours to ensure the protection and safety of the adjacent property owners, pedestrians, bicyclists, vehicular traffic and the general public from any construction related activity, construction equipment and the construction site itself.

2. The Contractor shall provide two weeks advance notification to Arlington County TE&O regarding the traffic signal timing modification at S Arlington Mill Dr and Shirlington Rd prior to removing any pedestrian signal head and push button, and replacing the associated crosswalk pavement markings.

3. All removed traffic signal equipment shall be returned to Arlington County Department of Environmental Services (DES) located at 4300 29th St S., Arlington, VA 22206.

VDOT OPERATIONS REQUIRES NOTIFICATION WHEN TRAFFIC CONTROL IMPACTS THE TRAVEL WAY. PLEASE CONTACT CARLENE MCWHIRT 571-350-2078 FOR ADDITIONAL INFORMATION OF LCAM REQUIREMENTS.

GENERAL MAINTENANCE OF TRAFFIC NOTES:

1. TRAFFIC CONTROL DEVICES AND SAFETY MEASURES SHALL COMPLY WITH THE VIRGINIA WORK AREA PROTECTION MANUAL, VDOT'S GUIDELINES FOR TEMPORARY TRAFFIC CONTROL, FEDERAL HIGHWAY ADMINISTRATION MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, ARLINGTON COUNTY STANDARDS, THE TRAFFIC CONTROL PLANS INCLUDED IN THE CONSTRUCTION DRAWINGS, AND/OR AS DIRECTED BY THE PROJECT OFFICER.
2. THE CONTRACTOR SHALL SUBMIT A DETAILED SCHEDULE WHICH INDICATES START AND FINISH DATES FOR EACH SEGMENT OF THE WORK. THE SCHEDULE SHALL INDICATE THE DURATION OF ALL LANE OR SHOULDER CLOSURES. THE CONTRACTOR SHALL NOTIFY THE PROJECT OFFICER A MINIMUM OF 3 BUSINESS DAYS IN ADVANCE OF PROCEEDING TO THE NEXT WORK SEGMENT.
3. THE CONTRACTOR SHALL NOTIFY THE PROJECT OFFICER OF PARKING RESTRICTION NEEDS A MINIMUM OF 3 BUSINESS DAYS PRIOR TO COMMENCEMENT OF WORK FOR EACH SEGMENT. COUNTY PROJECT OFFICER SHALL RESTRICT PARKING BY CONTACTING DES - PERMITTING SECTION, 703-228-4798.
4. DURING CONSTRUCTION, THE CONTRACTOR SHALL EITHER MAINTAIN APPROPRIATE SIGHT DISTANCE TO ALL TRAFFIC SIGNS OR PROVIDE FOR TEMPORARY SIGNAGE OR FLAGGERS TO GUIDE TRAFFIC THROUGH WORK ZONES.
5. THE CONTRACTOR SHALL MINIMIZE THE DURATION OF ANY BLOCKAGE TO PRIVATE ENTRANCES AND DRIVEWAYS. THE CONTRACTOR SHALL SUBMIT A SCHEDULE OF DRIVEWAY CLOSURE FOR APPROVAL BY THE PROJECT OFFICER. THE PROJECT OFFICER SHALL BE NOTIFIED A MINIMUM OF 3 BUSINESS DAYS IN ADVANCE OF SUCH ACTIVITIES. THE CONTRACTOR SHALL NOTIFY THE PROPERTY OWNER AT LEAST 24 HOURS IN ADVANCE OF THE START OF ANY WORK THAT WILL REQUIRE TEMPORARY CLOSURE OF ACCESS TO THE PROPERTY. THE CONTRACTOR SHALL MAKE ALL PRIVATE ENTRANCES AND DRIVEWAYS ACCESSIBLE AT THE CONCLUSION OF EACH WORKDAY.
6. ANY EXCAVATIONS WHICH ARE SPECIFICALLY APPROVED BY THE PROJECT OFFICER TO REMAIN OPEN PAST NORMAL WORKING HOURS SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR AND SHALL BE PROTECTED IN ACCORDANCE WITH THE VIRGINIA WORK AREA PROTECTION MANUAL AND AS APPROVED BY THE PROJECT OFFICER.
7. PEDESTRIAN TRAFFIC SHALL BE MAINTAINED AT ALL TIMES, INCLUDING ACCESS TO BUS STOP SHELTERS, UNLESS OTHERWISE APPROVED IN THE PLANS.
8. PEDESTRIAN TRAFFIC SHALL BE SEPARATED FROM WORK ZONES WITH APPROPRIATE MEASURES IN ACCORDANCE WITH MUTCD.
9. ADEQUATE PROVISIONS FOR PERSONS WITH DISABILITIES SHALL BE PROVIDED AT ALL TIMES PER ADA REQUIREMENTS.
10. WHEN NECESSARY, PEDESTRIANS SHALL BE APPROPRIATELY DIRECTED WITH ADVANCED WARNING SIGNS PLACED AT INTERSECTIONS, TO CROSS TO THE OPPOSITE SIDE OF THE ROADWAY IN ORDER TO PREVENT CONFLICT WITH MIDBLOCK WORK SITES.
11. PEDESTRIANS SHALL NOT BE LED INTO CONFLICT WITH WORK SITE EQUIPMENT, OPERATIONS, AND/OR VEHICLES MOVING THROUGH OR AROUND THE WORK SITE.
12. ALL EXISTING FIRE HYDRANTS AND FIRE DEPARTMENT CONNECTIONS SHALL BE MAINTAINED UNOBSTRUCTED AND ACCESSIBLE AT ALL TIMES IN ACCORDANCE WITH SECTIONS 508.5.4 AND 508.5.5 OF THE ARLINGTON COUNTY FIRE PREVENTION CODE.
13. ACCESS TO BUILDINGS FOR FIREFIGHTING SHALL BE MAINTAINED AT ALL TIMES. EXISTING FIRE APPARATUS ACCESS ROADS (FIRE LANES) SHALL BE KEPT CLEAR OF OBSTRUCTIONS IN ACCORDANCE WITH SECTION 503.4 OF THE ARLINGTON COUNTY FIRE PREVENTION CODE. ACCESS TO CONSTRUCTION SITES SHALL BE PROVIDED AND MAINTAINED IN ACCORDANCE WITH SECTION 1410 OF THE ARLINGTON COUNTY FIRE PREVENTION CODE.
14. IN THE EVENT THAT EXISTING FIRE DEPARTMENT CONNECTIONS OR FIRE APPARATUS ACCESS ROADS (FIRE LANES) MUST BE OBSTRUCTED TO FACILITATE CONSTRUCTION ACTIVITIES, CONTACT THE ARLINGTON COUNTY FIRED DEPARTMENT FIRE PREVENTION OFFICE AT 703-228-4644 TO COORDINATE REVIEW AND APPROVAL OF TEMPORARY FIRE DEPARTMENT CONNECTIONS AND/OR FIRE APPARATUS ACCESS ROADS PRIOR TO CREATING THE OBSTRUCTION.
15. THE CONTRACTOR SHALL COORDINATE WITH ARLINGTON COUNTY TRANSIT BUREAU, 703-228-3049, A MINIMUM OF 4 WEEKS PRIOR TO COMMENCEMENT OF WORK IF TRANSIT IS AFFECTED OR IF THERE ARE ANY IMPACTS TO THE TRANSIT STOPS OR ROUTES. NOTE: ALL TEMPORARY AND FINAL BUS TRAVEL LANES MUST BE A MINIMUM OF 11' WIDE.
16. AT SIGNALIZED INTERSECTIONS, THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING VEHICLE DETECTION AT ALL TIMES DURING THE PROJECT. TRAFFIC SENSORS SHALL BE RESTORED TO THEIR PRE-CONSTRUCTION STATE PRIOR TO THE COMPLETION OF THIS PROJECT.
17. WORK HOURS ARE RESTRICTED TO 8 AM TO 6 PM (MON-FRI).
18. CONTRACTOR SHALL COVER ANY EXISTING SIGNS WHICH ARE NOT APPLICABLE OR ARE IN CONFLICT WITH THIS MOT PLAN.
19. CONTRACTOR SHALL ERADICATE AND RE-STRIPE AS NECESSARY ANY EXISTING PAVEMENT MARKINGS THAT ARE IN CONFLICT WITH OR DO NOT ALIGN WITH THE TEMPORARY PAVEMENT MARKINGS OR NEW TRAFFIC PATTERNS.
20. CONTRACTOR SHALL ERADICATE ALL TEMPORARY PAVEMENT MARKING, INCLUDING TEMPORARY MARKED CROSSWALKS ONCE THE WORK AREA(S) ASSOCIATED WITH THE MARKINGS HAS BEEN COMPLETED.
21. COORDINATE WITH DES-TRANSIT BUREAU AT 703-228-3049 AT LEAST 4 WEEKS PRIOR TO COMMENCEMENT OF WORK IF TRANSIT IS AFFECTED OR IF THERE ARE ANY IMPACTS TO TRANSIT STOPS OR ROUTES.
22. ALL TEMPORARY AND FINAL BUS TRAVEL LANES MUST BE MINIMUM 11 FEET WIDE.
23. TEO SIGNAL CONSTRUCTION MANAGER SHALL BE INFORMED 1 WEEK PRIOR TO CHANGING ZONES/PHASES OF MOT.

MOT RECOMMENDED TTC:

MOT ZONE#	TTC#	COMMENTS	DURATION
ZONE# A1	TTC-17.2 TTC-36.2	CONSTRUCTION: RRFB POLE AND ASSEMBLY INSTALLATION MOT: LANE CLOSURE, PED-CROSSING CLOSURE	LESS THAN 1 WEEK
ZONE# A2	TTC-16.2 TTC-36.2	CONSTRUCTION: PEDESTRIAN RAMP, CURB, GUTTER, RRFB POLE RELOCATION MOT: LANE CLOSURE, PED-CROSSING CLOSURE	LESS THAN 1 WEEK
ZONE# B	TTC-16.2 TTC-35.1 TTC-36.2	CONSTRUCTION: PEDESTRIAN BRIDGE, STREET REALIGNMENT, SIDEWALK, TRAFFIC SIGNAL, STREET LIGHTS, DRAINAGE MOT: LANE CLOSURE, PED-CROSSING CLOSURE	1-5 MONTHS
ZONE# C1	TTC-17.2 TTC-36.2	CONSTRUCTION: RAISED MEDIAN NOSE MOT: LANE CLOSURE, PED-CROSSING CLOSURE	LESS THAN 1 WEEK
ZONE# C2	TTC-13.2 TTC-36.2	CROSSWALK PAVEMENT MARKINGS ERADICATION AND INSTALLATION AND MILLING/OVERLAY MOT: MOVING/MOBILE OPERATION, PED-CROSSING CLOSURE	LESS THAN 1 DAY
ZONE# D	TTC-16.2 TTC-36.2	CONSTRUCTION: RAMP MOT: LANE CLOSURE, PED-CROSSING CLOSURE	LESS THAN 1 WEEK
ZONE# E1	TTC-16.2 TTC-36.2 TTC-57.2	CONSTRUCTION: RIGHT-TURN CHANNELIZED RAISED MEDIAN ISLAND, CROSSWALK PAVEMENT MARKINGS ERADICATION AND MILLING/OVERLAY MOT: LANE CLOSURE, PED-CROSSING CLOSURE, END OF DAY PAVING OPERATION	LESS THAN 1 WEEK
ZONE# E2	TTC-17.2 TTC-36.2 TTC-57.2	CROSSWALK PAVEMENT MARKINGS ERADICATION AND MILLING/OVERLAY MOT: LANE CLOSURE, PED-CROSSING CLOSURE, END OF DAY PAVING OPERATION	LESS THAN 1 DAY
ZONE# F	TTC-16.2 TTC-17.2 TTC-36.2 TTC-57.2	CONSTRUCTION: RAISED MEDIAN NOSE MOT: LANE CLOSURE, PED-CROSSING CLOSURE, END OF DAY PAVING OPERATION	LESS THAN 1 WEEK
ZONE# G1	TTC-36.2	CROSSWALK PAVEMENT MARKINGS ERADICATION AND MILLING/OVERLAY MOT: LANE CLOSURE, PED-CROSSING CLOSURE, END OF DAY PAVING OPERATION	LESS THAN 1 DAY
ZONE# G2	TTC-16.2 TTC-36.2 TTC-57.2	CROSSWALK PAVEMENT MARKINGS ERADICATION AND MILLING/OVERLAY MOT: LANE CLOSURE, PED-CROSSING CLOSURE, END OF DAY PAVING OPERATION	LESS THAN 1 DAY
ZONE# H (SEE SIGN & MARKING PLAN)	TTC-13.2 TTC-36.2	PAVEMENT MARKING ERADICATION AND INSTALLATION MOT: MOVING/MOBILE OPERATION, PED-CROSSING CLOSURE	LESS THAN 1 DAY

NOTE: THE DURATIONS SHOWN WERE DEVELOPED FOR PLANNING AND ESTIMATION PURPOSES ONLY. THE DURATIONS IN NO WAY ALTER THE CONTRACT TIME FOR COMPLETION, OR INFRINGES ON THE CONTRACTORS MEANS AND METHODS. THE CONTRACTOR'S SUBMITTED SCHEDULE SUPERSEDES THE ESTIMATED DURATIONS SHOWN.

Commonwealth of Virginia
Virginia Department of Transportation

VERIFICATION OF COMPLETION OF
ADVANCED WORK ZONE TRAFFIC CONTROL TRAINING
AND FLAGGER CERTIFICATION

This is to verify that **Hari Thaker** has successfully completed training and an examination by the Department on the proper practices and methods for the installation, maintenance, removal of temporary traffic control devices and flagging operations.

Date: 7/31/2019

State Traffic Engineer

Verification No.: 072119102 Expiration Date: 7/31/2023

Approved: 10/3/2022
Subject to field inspection
LDA22115

ARLINGTON VIRGINIA

DEPARTMENT OF ENVIRONMENTAL SERVICES
FACILITIES & ENGINEERING DIVISION
ENGINEERING BUREAU
2100 CLARENDON BOULEVARD, SUITE 813
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SEAL

COMMONWEALTH OF VIRGINIA
HARSHIT THAKER
Lic. No. 049174
05-19-2022
PROFESSIONAL ENGINEER

APPROVALS	DATE
DESIGN TEAM ENGINEER SUPERVISOR	9/28/2022
CONSTRUCTION MANAGEMENT SUPERVISOR	10/13/22
WATER/SEWER, STREETS BUREAU CHIEF	10/5/22
TRANSPORTATION DIRECTOR	10/5/22
PROJECT MANAGER	9/27/2022

REVISIONS	DATE

SHIRLINGTON ROAD PEDESTRIAN BRIDGE
BR02
SHIRLINGTON ROAD

MAINTENANCE OF TRAFFIC - 01
TRANSPORTATION MANAGEMENT PLAN

DESIGNED: JS
DRAWN: JS
CHECKED: HT

PLOTTED: JULY 13 2022

SCALE:

0 25 50
GRAPHIC SCALE

C120.1

REVISED ON 1/24/2022

ZONE A1

RRFB POLE INSTALLATION ON SHIRLINGTON RD

- PERFORM SINGLE LEFT-LANE CLOSURE ON NB AND SB SHIRLINGTON RD PER TTC-17.2 DURING OFF-PEAK HOURS FOR THE PROPOSED WORK.
- PERFORM CROSSWALK CLOSURE PER TTC-36.2 ON AS-NEEDED BASIS. CROSSWALK CLOSED - USE OTHER SIDE WITH LEFT AND/OR RIGHT ARROW(S) (R9-10(MOD)) SIGN SHALL BE USED TO DIVERT PEDESTRIANS/BICYCLISTS THROUGH ADJACENT CROSSWALKS.
- WORK AREA SHALL BE PROTECTED WITH TYPE III BARRICADES AND/OR TRAFFIC DRUMS.

ZONE A2

EAST PEDESTRIAN RAMP CONSTRUCTION

- PERFORM SINGLE RIGHT-LANE CLOSURE ON I-395 OFF-RAMP PER TTC-16.2 DURING OFF-PEAK HOURS FOR THE PROPOSED WORK.
- PERFORM CROSSWALK CLOSURE PER TTC-36.2 ON AS-NEEDED BASIS. CROSSWALK CLOSED - USE OTHER SIDE WITH LEFT AND/OR RIGHT ARROW(S) (R9-10(MOD)) SIGN SHALL BE USED TO DIVERT PEDESTRIANS/BICYCLISTS THROUGH ADJACENT CROSSWALKS.
- WORK AREA SHALL BE PROTECTED WITH TYPE III BARRICADES AND/OR TRAFFIC DRUMS.
- MINIMUM 5 FOOT PEDESTRIAN PATHWAY SHALL BE MAINTAINED AT ALL TIMES.

ZONE B

SOUTH ENTRANCE FOR THE PEDESTRIAN BRIDGE CONSTRUCTION (AS SECONDARY ENTRANCE DURING THE OFF-PEAK LANE CLOSURE ONLY)

- PERFORM SINGLE RIGHT-LANE CLOSURE PER TTC-16.2 DURING OFF-PEAK HOURS FOR THE PROPOSED WORK.
- PERFORM CROSSWALK CLOSURE PER TTC-36.2 ON AS-NEEDED BASIS. CROSSWALK CLOSED - USE OTHER SIDE WITH LEFT AND/OR RIGHT ARROW(S) (R9-10(MOD)) SIGN SHALL BE USED FOR CROSSWALK CLOSURES.
- PERFORM SIDEWALK CLOSURE PER TTC-35.1 ON AS NEEDED BASIS. SIDEWALK CLOSED (R9-9) SIGNS SHALL BE PLACED ON BOTH ENDS OF THE CLOSED ARLINGTON MILL TRAIL/SIDEWALKS WHILE SIDEWALK CLOSED AHEAD - CROSS HERE (R9-11R) SIGN SHALL BE PLACED AT THE NE QUADRANT OF S ARLINGTON MILL DR/S QUINCY ST INTERSECTION BEFORE THE EAST LEG CROSSWALK DURING THE SIDEWALK CLOSURE. ANOTHER SIDEWALK CLOSED AHEAD - CROSS HERE (R9-11L) SHALL BE PLACED AT THE NW QUADRANT OF S ARLINGTON MILL DR/SHIRLINGTON RD INTERSECTION BEFORE THE NORTH LEG CROSSWALK ADA WHEELCHAIR RAMP.
- REMOVE THE PEDESTRIAN SIGNAL HEAD FOR THE NORTH LEG CROSSWALK.
- MINIMUM 5 FOOT PEDESTRIAN PATHWAY ON EXISTING SIDEWALKS SHALL BE MAINTAINED AT ALL TIMES.

ZONE C1

RECONSTRUCTION OF RAISED MEDIAN NOSE FOR THE WEST LEG OF SHIRLINGTON RD AND S ARLINGTON MILL DR INTERSECTION

- PERFORM SINGLE LEFT-LANE CLOSURE PER TTC-17.2 ON BOTH EB AND WB S ARLINGTON MILL DR DURING OFF-PEAK HOURS FOR THE PROPOSED WORK.
- PERFORM CROSSWALK CLOSURE PER TTC-36.2 ON AS-NEEDED BASIS. CROSSWALK CLOSED - USE OTHER SIDE WITH LEFT AND/OR RIGHT ARROW(S) (R9-10(MOD)) SIGN SHALL BE USED TO DIVERT PEDESTRIANS/BICYCLISTS THROUGH ADJACENT CROSSWALKS.

ZONE C2

PAVEMENT MARKING ERADITCATION AND INSTALLATION ON S ARLINGTON MILL DR TO CONNECT BOTH PROPOSED AND EXISTING RAMPS

- PERFORM SINGLE LEFT- AND SINGLE RIGHT-LANE MOVING OPERATION PER TTC-13.2 FOR THE PROPOSED WORK.
- PERFORM CROSSWALK CLOSURE PER TTC-36.2 ON AS-NEEDED BASIS. CROSSWALK CLOSED - USE OTHER SIDE WITH LEFT AND/OR RIGHT ARROW(S) (R9-10(MOD)) SIGN SHALL BE USED TO DIVERT PEDESTRIANS/BICYCLISTS THROUGH ADJACENT CROSSWALKS.

ZONE D

PROPOSED RAMP CONSTRUCTION ON EB S ARLINGTON MILL DR

- PERFORM SINGLE RIGHT-LANE CLOSURE PER TTC-16.2 DURING OFF-PEAK HOURS FOR THE PROPOSED WORK.
- ADJUSTMENT SHALL BE MADE TO THE RIGHT-LANE CLOSURE TO ALLOW FOR RIGHT TURN MOVEMENT ONTO SB SHIRLINGTON RD THROUGH THE EXISTING RIGHT-TURN CHANNELIZED RAISED MEDIAN ISLAND.
- PERFORM CROSSWALK CLOSURE PER TTC-36.2 ON AS-NEEDED BASIS. CROSSWALK CLOSED - USE OTHER SIDE WITH LEFT AND/OR RIGHT ARROW(S) (R9-10(MOD)) SIGN SHALL BE USED TO DIVERT PEDESTRIANS/BICYCLISTS THROUGH ADJACENT CROSSWALKS.

ZONE E1

RECONSTRUCTION OF RIGHT-TURN CHANNELIZED RAISED MEDIAN ISLAND AT THE I-395 OFF-RAMP APPROACH BEFORE THE INTERSECTION

- PERFORM SINGLE RIGHT-LANE CLOSURE ON BOTH I-395 OFF-RAMP AND ON NB SHIRLINGTON RD PER TTC-16.2 DURING OFF-PEAK HOURS FOR THE PROPOSED WORK.
- ADJUSTMENT SHALL BE MADE TO THE RIGHT-LANE CLOSURE ON THE I-395 OFF-RAMP APPROACH TO ALLOW FOR RIGHT TURN MOVEMENT ONTO NB SHIRLINGTON RD.
- PERFORM CROSSWALK CLOSURE PER TTC-36.2 ON AS-NEEDED BASIS. CROSSWALK CLOSED - USE OTHER SIDE WITH LEFT AND/OR RIGHT ARROW(S) (R9-10(MOD)) SIGN SHALL BE USED TO DIVERT PEDESTRIANS/BICYCLISTS THROUGH ADJACENT CROSSWALKS.
- REMOVE THE PEDESTRIAN SIGNAL HEAD AND PUSH BUTTON FOR THE NORTH LEG CROSSWALK.
- PERFORM MILLING/OVERLAY OPERATION PER TTC-57.2 AT THE END OF DAY.

ZONE E2

PAVEMENT MARKING ERADITCATION AND MILLING/OVERLAY OPERATION

- PERFORM SINGLE LEFT-LANE CLOSURE ON SHIRLINGTON RD PER TTC-17.2 DURING OFF-PEAK HOURS FOR THE PROPOSED WORK.
- PERFORM CROSSWALK CLOSURE PER TTC-36.2 ON AS-NEEDED BASIS. CROSSWALK CLOSED - USE OTHER SIDE WITH LEFT AND/OR RIGHT ARROW(S) (R9-10(MOD)) SIGN SHALL BE USED TO DIVERT PEDESTRIANS/BICYCLISTS THROUGH ADJACENT CROSSWALKS.
- PERFORM MILLING/OVERLAY OPERATION PER TTC-57.2 AT THE END OF DAY.

ZONE F

RECONSTRUCTION OF RAISED MEDIAN NOSE FOR EAST LEG OF SHIRLINGTON RD AND S ARLINGTON MILL DR INTERSECTION

- PERFORM SINGLE LEFT-LANE CLOSURE ON I-395 OFF-RAMP APPROACH PER TTC-17.2 DURING OFF-PEAK HOURS FOR THE PROPOSED WORK.
- PERFORM SINGLE RIGHT-LANE CLOSURE ON S ARLINGTON MILL RD (EAST LEG) PER TTC-16.2 DURING OFF-PEAK HOURS FOR THE PROPOSED WORK.
- PERFORM SINGLE RIGHT-LANE CLOSURE ON NB SHIRLINGTON RD PER TTC-16.2 DURING OFF-PEAK HOURS FOR THE PROPOSED WORK.
- PERFORM CROSSWALK CLOSURE PER TTC-36.2 ON AS-NEEDED BASIS. CROSSWALK CLOSED - USE OTHER SIDE WITH LEFT AND/OR RIGHT ARROW(S) (R9-10(MOD)) SIGN SHALL BE USED TO DIVERT PEDESTRIANS/BICYCLISTS THROUGH ADJACENT CROSSWALKS.
- PERFORM MILLING/OVERLAY OPERATION PER TTC-57.2 AT THE END OF DAY.

ZONE G1

PAVEMENT MARKING ERADITCATION AND MILLING/OVERLAY OPERATION

- PERFORM SINGLE LEFT-LANE CLOSURE ON SHIRLINGTON RD PER TTC-17.2 DURING OFF-PEAK HOURS FOR THE PROPOSED WORK.
- PERFORM CROSSWALK CLOSURE PER TTC-36.2 ON AS-NEEDED BASIS. CROSSWALK CLOSED - USE OTHER SIDE WITH LEFT AND/OR RIGHT ARROW(S) (R9-10(MOD)) SIGN SHALL BE USED TO DIVERT PEDESTRIANS/BICYCLISTS THROUGH ADJACENT CROSSWALKS.
- PERFORM MILLING/OVERLAY OPERATION PER TTC-57.2 AT THE END OF DAY.

ZONE G2

PAVEMENT MARKING ERADITCATION AND MILLING/OVERLAY OPERATION

- PERFORM SINGLE RIGHT-LANE CLOSURE ON SHIRLINGTON RD PER TTC-16.2 DURING OFF-PEAK HOURS FOR THE PROPOSED WORK.
- PERFORM CROSSWALK CLOSURE PER TTC-36.2 ON AS-NEEDED BASIS. CROSSWALK CLOSED - USE OTHER SIDE WITH LEFT AND/OR RIGHT ARROW(S) (R9-10(MOD)) SIGN SHALL BE USED TO DIVERT PEDESTRIANS/BICYCLISTS THROUGH ADJACENT CROSSWALKS.
- PERFORM MILLING/OVERLAY OPERATION PER TTC-57.2 AT THE END OF DAY.

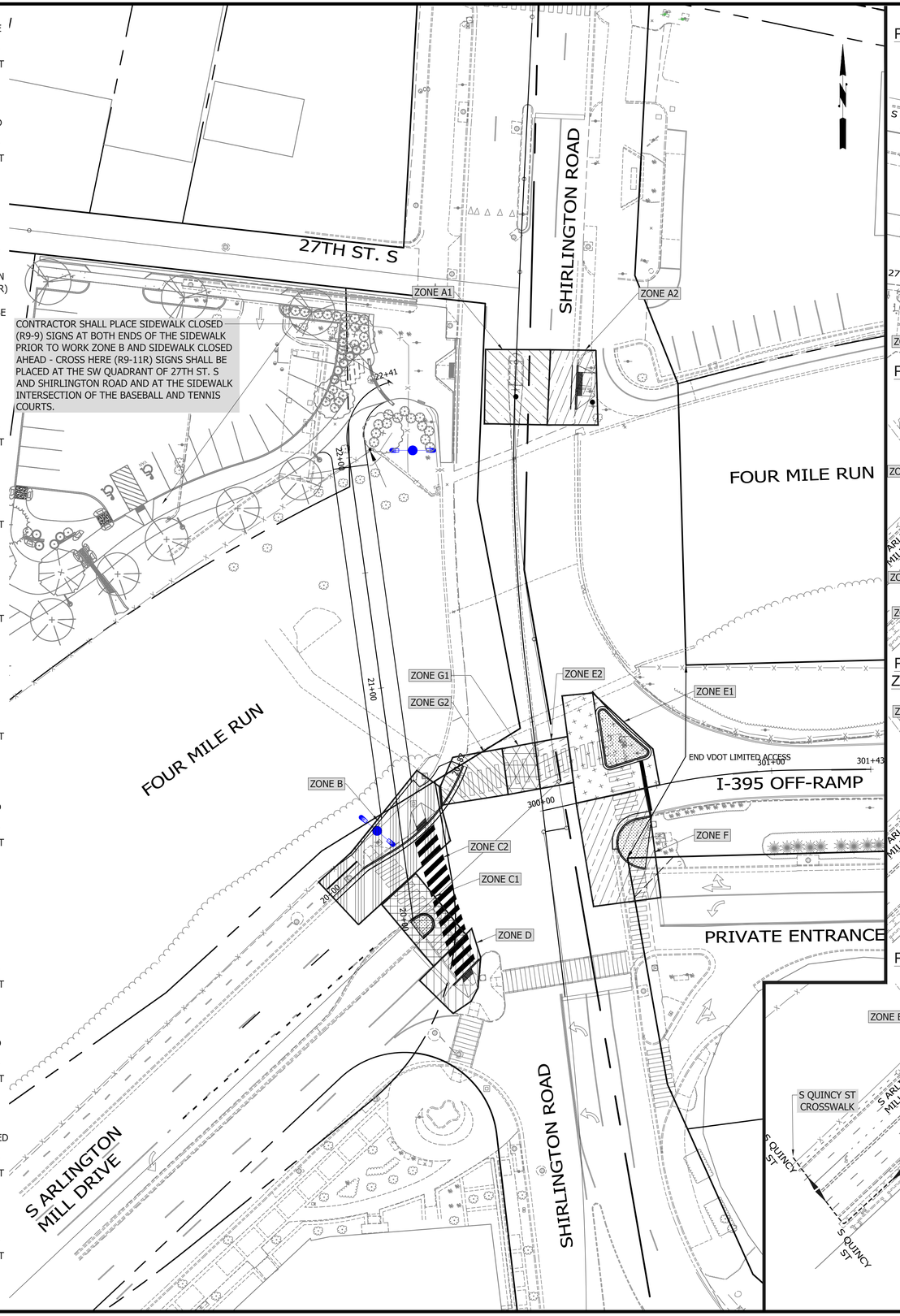
ZONE H
(NOT SHOWN)

SEE SIGN AND MARKING PLAN FOR MORE DETAILS

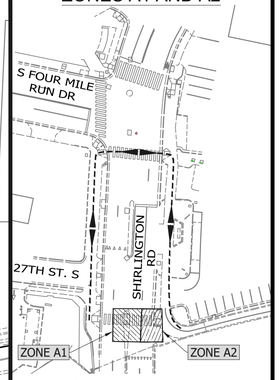
REMAINING PAVEMENT MARKING ERADICATION AND INSTALLATION WORK PER SIGN AND MARKING PLAN

- PERFORM SINGLE LEFT- AND RIGHT-LANE MOVING OPERATION PER TTC-13.2 FOR THE PROPOSED WORK.
- PERFORM CROSSWALK CLOSURE PER TTC-36.2 ON AS-NEEDED BASIS. CROSSWALK CLOSED - USE OTHER SIDE WITH LEFT AND/OR RIGHT ARROW(S) (R9-10(MOD)) SIGN SHALL BE USED TO DIVERT PEDESTRIANS/BICYCLISTS THROUGH ADJACENT CROSSWALKS.

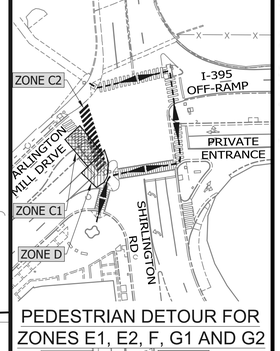
*** REFER TO GENERAL CONSTRUCTION NOTE NO. 2 SHOWN ON SHEET C120.1 REGARDING THE TRAFFIC SIGNAL TIMING MODIFICATION FOR APPLICABLE MOT ZONE.



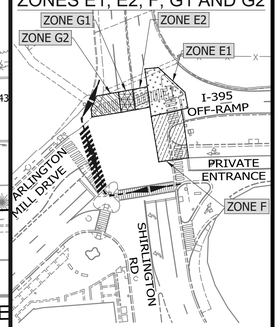
PEDESTRIAN DETOUR FOR ZONES A1 AND A2



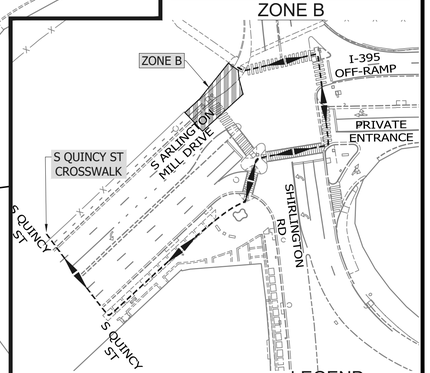
PEDESTRIAN DETOUR FOR ZONES C1, C2 AND D



PEDESTRIAN DETOUR FOR ZONES E1, E2, F, G1 AND G2



PEDESTRIAN DETOUR FOR ZONE B



LEGEND

PEDESTRIAN PATH

ARLINGTON VIRGINIA

Approved: 10/3/2022
Subject to field inspection
LDA22115

ARLINGTON VIRGINIA

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05-19-2022
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DESIGN TEAM ENGINEER SUPERVISOR	9/28/2022
CONSTRUCTION MANAGEMENT SUPERVISOR	10/13/22
WATER, SEWER, STREETS BUREAU CHIEF	10/5/22
TRANSPORTATION DIRECTOR Dennis M. Leach	10/5/22
PROJECT MANAGER Rens Harris	9/27/2022

REVISIONS	DATE

SHIRLINGTON ROAD PEDESTRIAN BRIDGE
BR02
SHIRLINGTON ROAD
MAINTENANCE OF TRAFFIC - 02
MOT PLAN

DESIGNED: JS
DRAWN: JS
CHECKED: HT

PLOTTED: JULY 13 2022

SCALE:

0 25 50
GRAPHIC SCALE

C121.1

FILENAME: BR02-286-MOT_PLAN.DWG PATH: T:\1009400 - MASTER-ARLINGTON COUNTY ON-CALL\1009450 - SHIRLINGTON RD PEDESTRIAN BRIDGE\07 DESIGN\DWG PLOTTED BY: BRENDA.DUONG

Typical Traffic Control
Moving/Mobile Operations on a Multi-Lane Roadway
(Figure TTC-13.2)
NOTES

Standard:

1. **Each vehicle involved in the moving/mobile operation shall be equipped with at least one high-intensity amber rotating, flashing[1], or oscillating light. Illuminated flashing arrows on the shadow vehicles and work operations vehicle shall be a Type B (60" x 30") or Type C (96" x 48"). Vehicle hazard warning signals shall not be used instead of rotating, flashing, or oscillating[1] lights, but as a supplement.**
2. **Each vehicle involved in the moving operation shall have radio communications between vehicles.[2]**

Option:

3. If the work operations vehicle is a motorized piece of equipment, such as a motor grader, grade-all, etc., the illuminated flashing arrow will not be required.
4. The static warning sign and arrow board may be replaced with a vehicle-mounted CMS with a minimum character height of 10".
5. Arrow direction and designation may change as needed.

Guidance:

6. *Spacing between vehicles may vary, depending on the speed, sight distance, and type of moving operation. Whenever adequate stopping sight distance exists to the rear, the shadow vehicle should maintain the minimum distance and proceed at the same speed as the work operation vehicle. The shadow vehicle should slow down in advance of vertical or horizontal curves that restrict sight distance.*
7. *Actual conditions could dictate more traffic control device needs in the operation. On high speed, high volume roads, a shadow vehicle on the shoulder with an arrow board and sign should be used. Also, in certain situations, appropriate stationary signing (SPRATING NEXT 5 MILES (W21-5)) could be used to further enhance safety.*

Standard:

8. **If Shadow Vehicle 1 cannot run completely on the shoulder and is partially in the travel lane, it shall be equipped with a truck-mounted attenuator (TMA).**
9. **When the work operations vehicle is stationary, Shadow Vehicle 2 following the work operations vehicle shall be in a position 80'-120' in advance of the work operations vehicle to provide protection. When the work operations vehicle is moving, Shadow Vehicle 2 following the work operations vehicle shall follow at a distance of 240'±.**

Option:

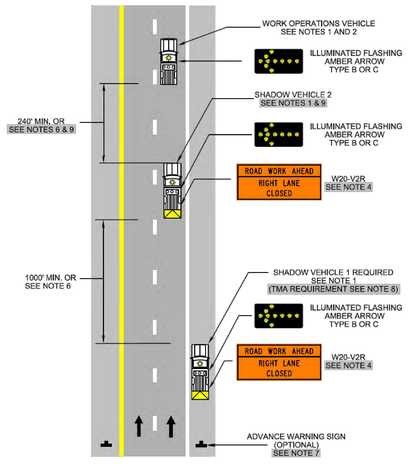
10. For inside lane closure operations, Shadow Vehicle 1 may be positioned on the right shoulder without arrow designation but displaying the caution mode.
11. When the operation is completely off the travelway, only one shadow vehicle will be required. A truck-mounted attenuator will not be required. The second line of the sign message shall be changed to "Right Shoulder" and the arrows shall be changed to the four corner caution mode.

Guidance:

12. *When using a vehicle-mounted CMS to replace the static sign and arrow board, each word message phase should be followed by the Type B arrow display.*

1: Revision 1 – 4/1/2015
2: Revision 2 – 9/1/2019

Moving/Mobile Operations on a Multi-Lane Roadway
(Figure TTC-13.2)



2: Revision 2 – 9/1/2019

Typical Traffic Control
Outside Lane Closure Operation on a Four-Lane Roadway
(Figure TTC-16.2)
NOTES

Standard:

1. **On divided highways having a median wider than 8', right and left sign assemblies shall be required.**

Guidance:

2. *Sign spacing should be 1300'-1500' for Limited Access highways. For all other roadways, the sign spacing should be 500'-800' where the posted speed limit is greater than 45 mph, and 350'-500' where the posted speed limit is 45 mph or less.*
3. *When closing a lane, a PCMS should be used in advance of the first warning sign if all of the left side signs cannot be installed.[3]*
4. *Care should be exercised when establishing the limits of the work zone to insure maximum possible sight distance in advance of the transition, based on the posted speed limit and at least equal to or greater than the values in Table 6H-3. For Limited Access highways a minimum of 1000' is desired.*
5. *All vehicles, equipment, workers, and their activities should be restricted to one side of the pavement.*

Standard:

6. **Taper length (L) and channelizing device spacing shall be at the following:**

Taper Length L

Speed Limit (mph)	Lane Width (Feet) 9	10	11	12	Remarks	Speed Limit (mph)	Lane Width (Feet) 9	10	11	12	Remarks
25	95	105	115	125	L=S*W/60	50	450	500	550	600	L=SW
30	135	150	165	180	L=S*W/60	55	495	550	605	660	L= SW
35	185	205	225	245	L=S*W/60	60	540	600	660	720	L=SW
40	240	270	295	320	L=S*W/60	65	585	650	715	780	L=SW
45	405	450	495	540	L=SW	70	630	700	770	840	L=SW
Limited Access highways shall use a 1000' merging taper regardless of the posted speed.											
Shifting Tapers see Table 6H-2.[3]						Shoulder Taper = ⅓ L Minimum					

7. **Channelizing device spacing shall be at the following:**

Channelizing Device Spacing

Location Spacing	Speed Limit (mph) 0 -35	36 +	Location Spacing	Speed Limit (mph) 0 -35	36 +	Location Spacing	Speed Limit (mph) 0 -35	36 +
Transition	20'	40'	Travelway	40'	80'	* Construction Access	80'	120'
*Construction access spacing may be increased to this distance, but shall not exceed one access per ¼ mile.								

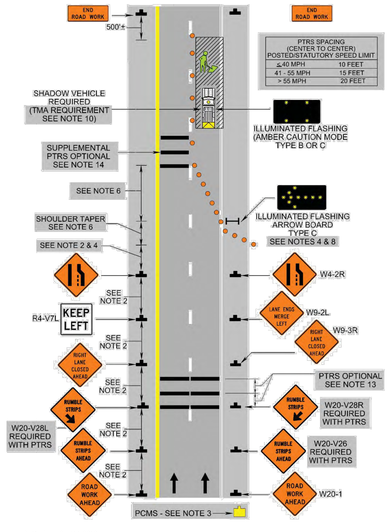
8. **An arrow board shall be used when a lane is closed. When more than one lane is closed, a separate arrow board shall be used for each closed lane (see Figure TTC-18).**
9. **The buffer space length shall be shown in Table 6H-3 on Page 6H-5 for the posted speed limit.**
10. **A shadow vehicle with either a Type B or C arrow board operating in the caution mode, or at least one high intensity amber rotating, flashing, or[1] oscillating light shall be parked 80'-120' in advance of the first work crew. When the posted speed limit is 45 mph or greater, a truck-mounted attenuator shall be used.**
11. **Vehicle hazard warning signals shall not be used instead of the vehicle's high-intensity amber rotating, flashing, or[1] oscillating lights but can be used to supplement the amber rotating, flashing, or[1] oscillating lights.**
12. **When a side road intersects the highway within the TTC zone, additional TTC devices shall be placed as needed.**

Option:[2]

13. PTRS and their supporting signs may be used, see Sections 6F.99 and 6G.25. Long-term transverse rumble strips may be used in long-term situations, see Section 6F.99 and TTC-20.[2]
14. The supplemental PTRS may be eliminated.[2]

1: Revision 1 – 4/1/2015
2: Revision 2 – 9/1/2019

Outside Lane Closure Operation on a Four-Lane Roadway
(Figure TTC-16.2)



2: Revision 2 – 9/1/2019
3: Revision 2.1 -11/1/2020

Typical Traffic Control
Inside Lane Closure Operation on a Four-Lane Roadway
(Figure TTC-17.2)
NOTES

Standard:

1. **On divided highways having a median wider than 8', right and left sign assemblies shall be required.**

Guidance:

2. *Sign spacing should be 1300'-1500' for Limited Access highways. For all other roadways, the sign spacing should be 500'-800' where the posted speed limit is greater than 45 mph, and 350'-500' where the posted speed limit is 45 mph or less.*
3. *When closing a lane, a PCMS should be used in advance of the first warning sign if all of the left side signs cannot be installed.[3]*
4. *Care should be exercised when establishing the limits of the work zone to insure maximum possible sight distance in advance of the transition, based on the posted speed limit and at least equal to or greater than the values in Table 6H-3. For Limited Access highways a minimum of 1000' is desired.*
5. *All vehicles, equipment, workers, and their activities should be restricted to one side of the pavement.*

Standard:

6. **Taper length (L) and channelizing device spacing shall be at the following:**

Taper Length L

Speed Limit (mph)	Lane Width (Feet) 9	10	11	12	Remarks	Speed Limit (mph)	Lane Width (Feet) 9	10	11	12	Remarks
25	95	105	115	125	L=S*W/60	50	450	500	550	600	L=SW
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40	240	270	295	320	L=S*W/60	65	585	650	715	780	L=SW
45	405	450	495	540	L=SW	70	630	700	770	840	L=SW
Limited Access highways shall use a 1000' merging taper regardless of the posted speed.											
Shifting Tapers see Table 6H-2.[3]						Shoulder Taper = ⅓ L Minimum					

7. **Channelizing device spacing shall be at the following:**

Location Spacing	Speed Limit (mph) 0 -35	36 +	Location Spacing	Speed Limit (mph) 0 -35	36 +	Location Spacing	Speed Limit (mph) 0 -35	36 +
Transition	20'	40'	Travelway	40'	80'	*Construction Access	80'	120'
*Construction access spacing may be increased to this distance, but shall not exceed one access per ¼ mile.								

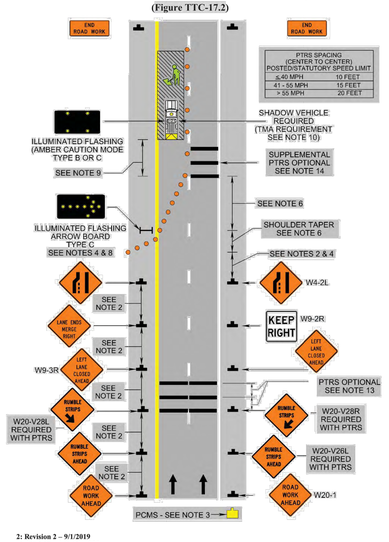
8. **An arrow board shall be used when a lane is closed. When more than one lane is closed, a separate arrow board shall be used for each closed lane (see Figure TTC-18).**
9. **The buffer space length shall be shown in Table 6H-3 on Page 6H-5 for the posted speed limit.**
10. **A shadow vehicle with either a Type B or C arrow board operating in the caution mode, or at least one high intensity amber rotating, flashing, or[1] oscillating light shall be parked 80'-120' in advance of the first work crew. When the posted speed limit is 45 mph or greater, a truck-mounted attenuator shall be used.**
11. **Vehicle hazard warning signals shall not be used instead of the vehicle's high-intensity amber rotating, flashing, or[1] oscillating lights but can be used to supplement the amber rotating, flashing, or[1] oscillating lights.**
12. **When a side road intersects the highway within the TTC zone, additional TTC devices shall be placed as needed.**

Option:[2]

13. PTRS and their supporting signs may be used, see sections 6F.99 and 6G.25. Long-term transverse rumble strips may be used in long-term situations, see Section 6F.99 and TTC-20.[2]
14. The supplemental PTRS may be eliminated.

1: Revision 1 – 4/1/2015

2: Revision 2 – 9/1/2019
Inside Lane Closure Operation on a Four-Lane Roadway
(Figure TTC-17.2)



2: Revision 2 – 9/1/2019
3: Revision 2.1 – 11/1/2020

Typical Traffic Control
Lane Closure Operation in an Intersection
(Figure TTC-28.2)
NOTES

Guidance:

1. *The control of traffic through the intersection in order of preference should be:*
   a. *Obtain the services of law enforcement personnel.*
   b. *Detour the effective routes to other roads and streets as approved and directed by the District Traffic Engineer.*
   c. *Place a state certified flagger on each leg of the intersection controlling a single lane of traffic.*

   Appropriate signing as shown should be used for law enforcement and flagging operations. For detour signs see Figure TTC-34.
2. *Sign spacing distance should be 350'-500' where the posted speed limit is 45 mph or less, 500'-800' where the posted speed limit is greater than 45 mph.*
3. *To maintain efficient traffic flow in a flagging operation on a two-lane roadway the maximum time motorist should be stopped at a flagger station is 8 minutes for high volume roadways (average daily traffic of 500 or more vehicles per day) to a maximum of 12 minutes for low volume roadways (less than 500 vehicles per day). For additional information see Section 6L.07.[3]*

Standard:

4. **Channelizing device spacing shall be on 20' centers or less.**
5. **PTRS shall be used as noted in Section 6F.99.**

Guidance:

6. *If room permits, a shadow vehicle with at least one rotating amber light or high intensity amber flashing or oscillating[1] light should be parked 80'-120' in advance of the first work crew.*

Standard:

7. **For emergency situations (any non-planned operation) of 30 minutes or less duration, two rotating amber lights or high intensity amber flashing or oscillating[1] lights mounted on the vehicle and visible for 360° shall be required in addition to the channelizing devices shown around the vehicle. Also, vehicle hazard warning signals shall be used.**

Guidance:

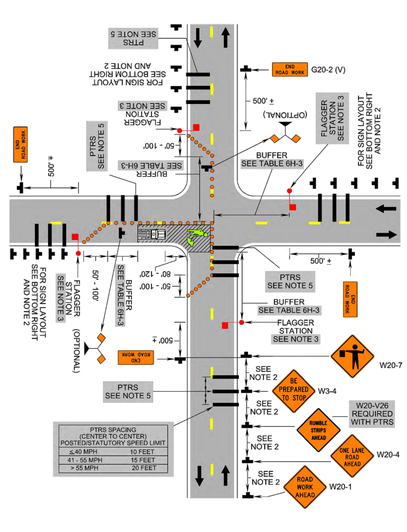
8. *If the work space extends across a crosswalk, the crosswalk should be closed using the information and devices shown in Figure TTC-36.*

Support:

9. Turns can be prohibited as required by vehicular traffic conditions. Unless the streets are wide, it might be physically impossible to make certain turns, especially for large vehicles.

1: Revision 1 – 4/1/2015
2: Revision 2 – 9/1/2019

Lane Closure Operation in an Intersection
(Figure TTC-28.2)



2: Revision 2 – 9/1/2019

ARLINGTON VIRGINIA
Approved: 10/3/2022
Subject to field inspection
LDA22115
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05-19-2022
PROFESSIONAL ENGINEER

APPROVALS DATE

DESIGN TEAM ENGINEER SUPERVISOR 9/28/2022
CONSTRUCTION MANAGEMENT SUPERVISOR 10/13/22
WATER/SEWER, STREETS BUREAU CHIEF 10/5/22
TRANSPORTATION DIRECTOR 10/5/22
PROJECT MANAGER 9/27/2022

REVISIONS DATE

SHIRLINGTON ROAD PEDESTRIAN BRIDGE
BR02
SHIRLINGTON ROAD
MAINTENANCE OF TRAFFIC - 03
TTC DETAILS

DESIGNED: JS
DRAWN: JS
CHECKED: HT

PLOTTED: JULY 13 2022

SCALE:
0 25 50
GRAPHIC SCALE

C122.1

REVISED ON 1/24/2022
FILENAME: BR02-286-MOT_PLAN.DWG PATH: T:\10099400 - MASTER-ARLINGTON COUNTY ON-CALL\10099450 - SHIRLINGTON RD PEDESTRIAN BRIDGE\07 DESIGN\DWG PLOTTED BY: BRENDA.DUONG

Typical Traffic Control

Sidewalk Closure and Bypass Sidewalk Operation

(Figure TTC-35.1)

NOTES

Standard:

1. **When crosswalks or other pedestrian facilities are closed or relocated, temporary facilities shall be detectable and shall include accessibility features consistent with the features present in the existing pedestrian facility.**

Guidance:

2. *Where high speeds are anticipated, a temporary traffic barrier and, if necessary, a crash cushion should be used to separate the temporary sidewalks from vehicular traffic.*
3. *Audible information devices should be considered where midblock closings and changed crosswalk areas cause inadequate communication to be provided to pedestrians who have visual disabilities.*
4. *Temporary markings should be considered for operations exceeding three days in duration.*

Option:

5. Only the TTC devices related to pedestrians are shown. Other devices, such as lane closure signing or ROAD NARROWS (W5-1) signs, may be used to control vehicular traffic.
6. For nighttime closures, Type A Flashing warning lights may be used on barricades that support signs and close sidewalks.
7. Signs, such as KEEP RIGHT (R4-V7R) and KEEP LEFT (R4-V7L), may be placed along a temporary sidewalk to guide or direct pedestrians.

Standard:

8. **All sidewalk closures shall be closed with Type 3 Barricades. The SIDEWALK CLOSED (R9-9) sign and the SIDEWALK CROSS HERE (R9-11) sign shall be installed above the Type 3 barricade. The KEEP RIGHT sign can cover the top rail of the Type 3 Barricade.[2]**

2: Revision 2 – 9/1/2019

Typical Traffic Control

Crosswalk Closure and Pedestrian Detour Operation

(Figure TTC-36.2)

NOTES

Standard:

1. **When crosswalks or other pedestrian facilities are closed or relocated, temporary facilities shall be detectable and shall include accessibility features consistent with the features present in the existing pedestrian facility.**
2. **Curb parking shall be prohibited for at least 50 feet in advance of the midblock crosswalk.**

Guidance:

3. *Audible information devices should be considered where midblock closings and changed crosswalk areas cause inadequate communication to be provided to pedestrians who have visual disabilities.*
4. *Pedestrian traffic signal displays controlling closed crosswalks should be covered or deactivated.*
5. *Temporary markings should be considered for operations exceeding three days in duration.*

Option:

6. Only the TTC devices related to pedestrians are shown. Other devices, such as lane closure signing or ROAD NARROWS (W5-1) signs, may be used to control vehicular traffic.
7. For nighttime closures, Type A Flashing warning lights may be used on barricades supporting signs and closing sidewalks.

Standard:

8. **In order to maintain the systematic use of the fluorescent yellow-green background for school warning signs in a jurisdiction, the fluorescent yellow-green background for school warning signs shall be used in TTC zones.[2]**
9. **All sidewalk closures shall be closed with Type 3 Barricades. The SIDEWALK CLOSED (R9-9) sign and the SIDEWALK CROSS HERE (R9-11) sign shall be installed above the Type 3 Barricade. The KEEP RIGHT sign can cover the top rail of the Type 3 Barricade.[2]**

Support:

10. Refer to Sections 3B-16 through 3B-18 of the 2009 MUTCD and the Virginia Supplement to the MUTCD[1] for crosswalk[1] lines, yield lines and other related TTC devices that may be used to control vehicular traffic at midblock crosswalks.

Standard:[2]

11. **The YIELD HERE TO PEDESTRIANS (R1-5) sign shall be placed at the Yield Line.**
12. **Fluorescent yellow-green PEDESTRIAN TRAFFIC (W11-2) symbol sign, AHEAD (W16-9p) plaque and ARROW (W16-7p) plaque shall be used to identify the work zone crosswalk.**

1: Revision 1 – 4/1/2015
2: Revision 2 – 9/1/2019

Typical Traffic Control

End of Day Signing for Partial Paving Operations on a Multi-Lane Roadway

(Figure TTC-57.2)

NOTES

Standard:

1. **On divided highways having a median wider than 8', right and left sign assemblies shall be used. Median barrier is considered to be part of the shoulder and its measurement shall be used to determined the total width of the shoulder.**
2. **The maximum pavement edge drop-off between traffic lanes shall be 2 inches or less.**
3. **Open travel lane(s) shall not be exposed to more than 2 to 3 mile sections of milled or uneven surface.**
4. **A portable changeable message sign with "ROUGH ROAD AHEAD" and other appropriate messages shall be used.**
5. **A BUMP (W8-1) sign shall be placed in advance of the end of the pavement drop-off.[1]**
6. **The District[2] Traffic Engineer shall determine speed reductions.**
7. **The UNEVEN LANES (W8-11), STAY IN LANE (R4-9), and BUMP signs shall be adjusted daily with the work operation and their sign stand shall be supported with a sand bag weighing approximately 25-pounds on each leg or two (2) drum collar weights positioned on the center of the sign stand[1]. Additional UNEVEN LANES signs shall be installed every 2 miles and on entrance ramps.**
8. **Where conditions warrant, ROUGH ROAD (W8-8) and BUMP signs shall be installed 500' ± in advance of the affected roadway surface on entrance ramps, and BUMP signs shall be installed 500' ± in advance of unaffected roadway surface on exit ramps.**
9. **All signs shall be post-mounted at locations after 72 consecutive hours of non-work activities.**

Guidance:

10. *Sign spacing distance should be 1300'-1500' for Limited Access highways, and on all other roadways 500'-800' where the posted speed limit is greater than 45 mph, and 350'-500' where the posted speed limit is 45 mph or less.*

Option:

11. Only traffic control signing for partial pavement resurfacing is shown. Other devices may be used for the control of traffic through the work area.
12. Temporary pavement markers spaced at 10 foot centers for two-way traffic centerlines or three per skip line for lane division lines may be added as directed by the engineer.
13. The LOW SHOULDER (W8-9) sign may be used to warn of a shoulder condition where there is an elevation difference of less than 2 inches between the shoulder and the travel lane.

Standard:

14. **If used, the LOW SHOULDER sign shall be repeated at 1 mile intervals if the condition extends over a distance in excess of 1 mile.**
15. **The SHOULDER DROP OFF (W8-V5) sign shall be used when an unprotected shoulder drop-off, adjacent to the travel lane, exceeds 2 inches depth between the shoulder and the travel lane. Where the condition extends over a distance in excess of 1 mile, the sign shall be repeated at 1 mile intervals.**

Option:

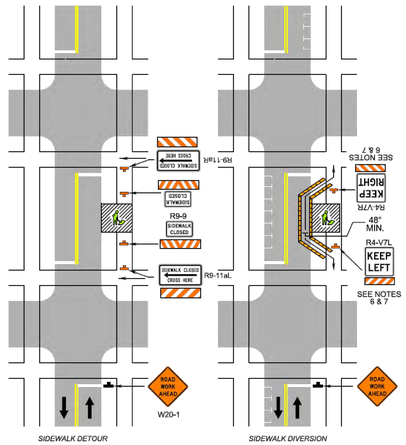
16. The SHOULDER DROP OFF sign may be eliminated if a 6:1 (desirable) to 4:1 (minimum) wedge is used between the travel lane and the shoulder.

Standard:

17. **A temporary pavement wedge shall be constructed of surface mix asphalt a minimum of three (3) feet in length for every inch of depth of pavement milling on the approach and departure end of the milled travel lane(s). Refer to Standard ACOT-1 of the Road and Bridge Standards for details.**
18. **A minimum of four (4) drum channelizing devices shall be placed on the shoulder in advance of the PCMS in a taper for delineation (see Figure 6F-6).**

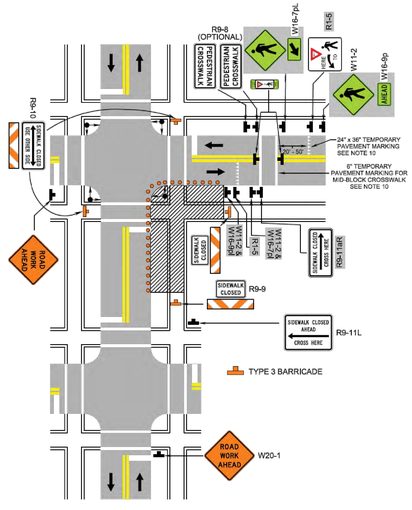
1: Revision 1 – 4/1/2015; 2: Revision 2 – 9/1/2019

Sidewalk Closure and Bypass Sidewalk Operation
(Figure TTC-35.1)



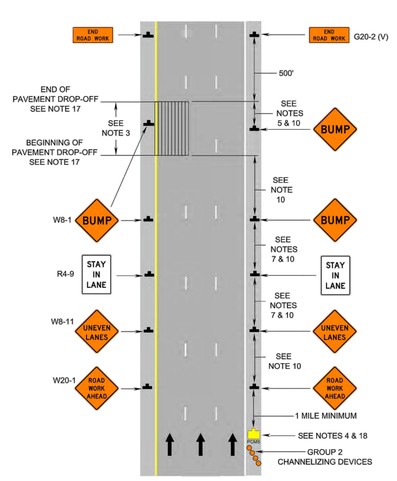
2: Revision 2 – 9/1/2019

Crosswalk Closure and Pedestrian Detour Operation
(Figure TTC-36.2)



1: Revision 1 – 4/1/2015
2: Revision 2 – 7/1/2018

End of Day Signing for Partial Paving Operations on a Multi-Lane Roadway
(Figure TTC-57.2)



REVISED ON 1/24/2022

FILENAME: BR02-286-MOT_PLAN.DWG PATH: T:\1009400 - MASTER-ARLINGTON COUNTY ON-CALL\1009450 - SHIRLINGTON RD PEDESTRIAN BRIDGE\07 DESIGN\DWG PLOTTED BY: BRENDA.DUONG

Approved: 10/3/2022
Subject to field inspection
LDA22115

ARLINGTON VIRGINIA

DEPARTMENT OF ENVIRONMENTAL SERVICES
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SEAL

COMMONWEALTH OF VIRGINIA
HARSHIT THAKER
Lic. No. 049174
05-19-2022
PROFESSIONAL ENGINEER

APPROVALS DATE

9/28/2022
DESIGN TEAM ENGINEER SUPERVISOR

10/13/22
CONSTRUCTION MANAGEMENT SUPERVISOR

10/5/22
WATER/SEWER, STREETS BUREAU CHIEF

Dennis M. Leach 10/5/22
TRANSPORTATION DIRECTOR

Rens Harris 9/27/2022
PROJECT MANAGER

REVISIONS DATE

SHIRLINGTON ROAD PEDESTRIAN BRIDGE
BR02
SHIRLINGTON ROAD

MAINTENANCE OF TRAFFIC - 04
TTC DETAILS

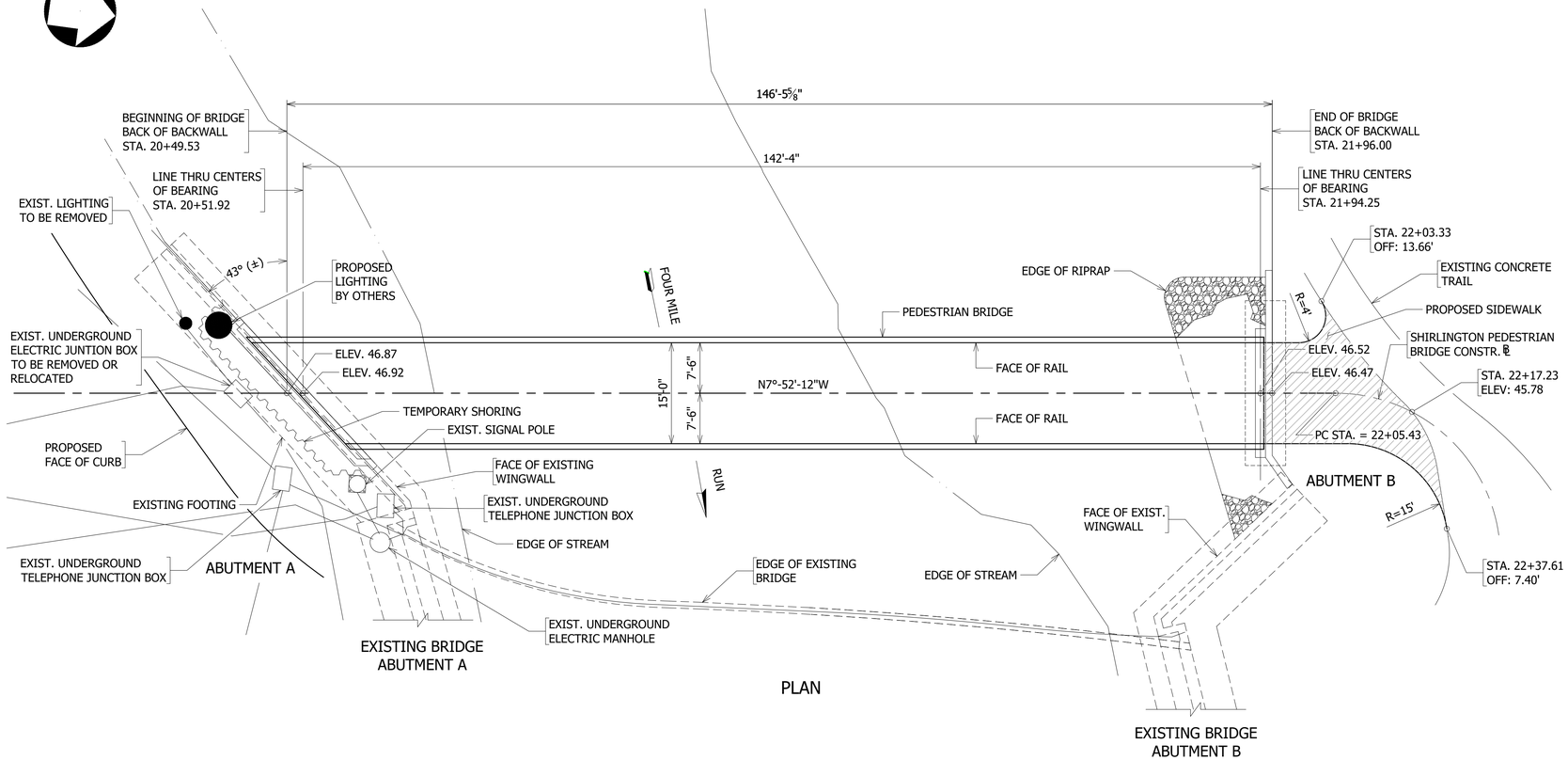
DESIGNED: JS
DRAWN: JS
CHECKED: HT

PLOTTED: JULY 13 2022

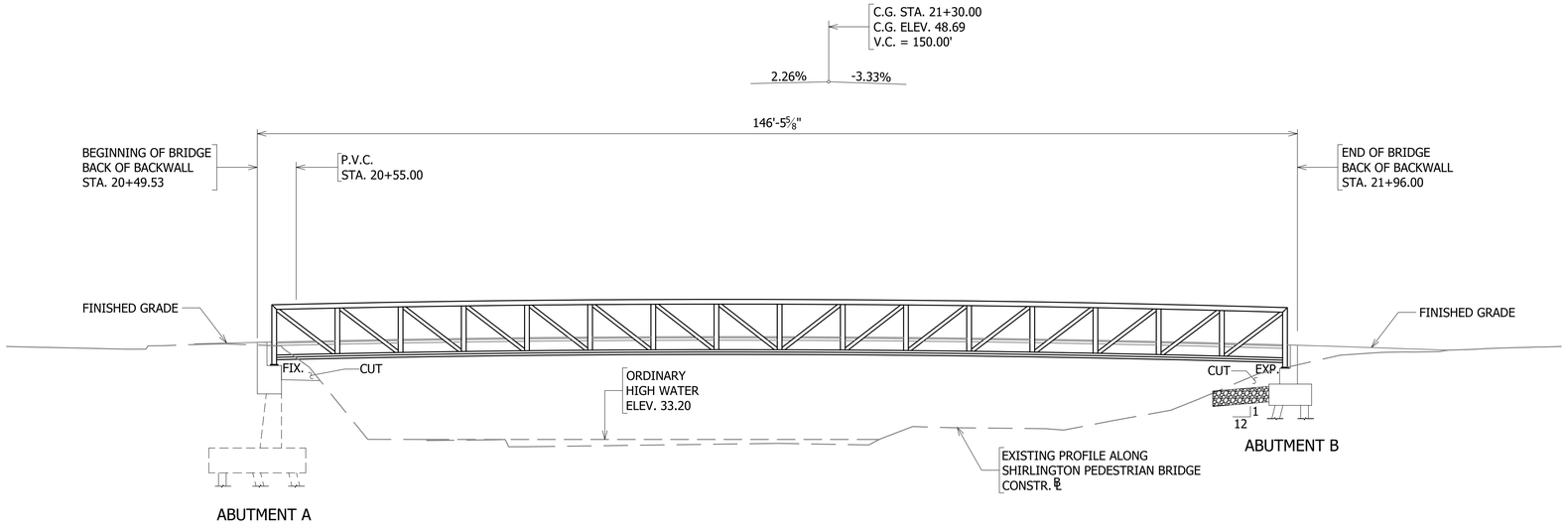
SCALE:

0 25 50
GRAPHIC SCALE

C122.1



PLAN



ELEVATION

GENERAL NOTES

WIDTH: 15'-0" FACE-TO-FACE RAILS.

SPAN LAYOUT: 144'-1¼" STEEL TRUSS SPAN.

CAPACITY: 90 PSF PEDESTRIAN LIVE LOAD AND 20,000 LB VEHICULAR LIVE LOAD

SPECIFICATIONS:

CONSTRUCTION: VIRGINIA DEPARTMENT OF TRANSPORTATION ROAD AND BRIDGE SPECIFICATIONS, 2020.

DESIGN: AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 8TH EDITION, 2017.

LRFD GUIDE SPECIFICATIONS FOR DESIGN OF PEDESTRIAN BRIDGES, 2ND EDITION.

THESES PLANS ARE INCOMPLETE UNLESS ACCOMPANIED BY THE SUPPLEMENTAL SPECIFICATIONS AND SPECIAL PROVISIONS INCLUDED IN THE CONTRACT DOCUMENTS.

CONCRETE IN SUBSTRUCTURE SHALL BE CLASS A3 IN ACCORDANCE WITH SECTION 217 OF THE VDOT ROAD AND BRIDGE SPECIFICATIONS.

PERMEABILITY TESTING DOES NOT APPLY TO THIS PROJECT.

DEFORMED REINFORCING BARS SHALL CONFORM TO ASTM A615, GRADE 60. ALL REINFORCING BAR DIMENSIONS ON THE DETAILED DRAWINGS ARE TO CENTER OF BARS EXCEPT WHERE OTHERWISE NOTED AND ARE SUBJECT TO FABRICATION AND CONSTRUCTION TOLERANCES.

H-PILES SHALL BE ASTM A709, GRADE 50 STEEL.

THE CONTRACTOR SHALL BACKFILL AREAS WITH APPROVED MATERIALS PER THE REQUIREMENTS OF THE VIRGINIA DEPARTMENT OF TRANSPORTATION. THE COST OF BACKFILL IS INCLUDED IN THE COST OF STRUCTURAL EXCAVATION.

PREFABRICATED STEEL TRUSS SHALL BE PAID ON A LUMP SUM BASIS, THE PRICE SHALL INCLUDE DESIGN, FABRICATION, DELIVERY, ERECTION, WOOD DECK, RUB RAILS, SAFETY RAILS, TOE PLATES, BEARING ASSEMBLIES, AND ANY ASSOCIATED FALSE WORK OR TEMPORARY SUPPORTS.

ALL COST ASSOCIATED WITH SITE ACCESS AND STAGING SHALL BE INCLUDED IN THE LUMP SUM BID PRICE FOR CONSTRUCTION ACCESS AND RESTORATION. THE LUMP SUM PRICE SHALL INCLUDE ALL COSTS FOR REMOVING AND REPLACING EXISTING SIGNS/STRUCTURES, STORING EQUIPMENT AND MATERIALS, TEMPORARY GRADING, AND RESTORING THE AREA TO ITS ORIGINAL CONDITION AFTER CONSTRUCTION IS COMPLETE.

APPROXIMATE LIMITS OF TEMPORARY SHORING SHOWN ON THE PLANS ARE FOR INFORMATIONAL PURPOSES ONLY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING THE ACTUAL LIMITS AND QUANTITIES OF TEMPORARY SHORING. THE COST OF DESIGN, INSTALLATION, AND REMOVAL OF THE TEMPORARY SHORING, WHEN NO LONGER REQUIRED, SHALL BE INCLUDED IN THE BID PRICE FOR THE TEMPORARY SHORING. THE PRICE SHALL BE FULL COMPENSATION FOR ALL LABOR, TOOLS, MATERIALS, EQUIPMENT, AND INCIDENTALS REQUIRED FOR THE SATISFACTORY COMPLETION OF THE WORK. THIS PRICE SHALL INCLUDE ALL TEMPORARY SHORING REQUIRED FOR CONSTRUCTION WHETHER OR NOT SHOWN ON THE PLANS. TEMPORARY SHORING SHALL BE PAID FOR ON A LUMP SUM BASIS.

ALL INFORMATION AND DIMENSIONS USED IN THE DEVELOPMENT OF THESE PLANS WERE TAKEN FROM EXISTING PLANS, FIELD MEASUREMENTS, AND SURVEY. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS, DETAILS, AND OTHER INFORMATION SHOWN IN THESE PLANS. ANY DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER PRIOR TO ORDERING MATERIALS AND PERFORMING ANY WORK.

PIPE HANDRAIL SHALL BE IN ACCORDANCE WITH ARLINGTON CO. STD. R-3.1 AND SECTION 05500 OF THE SPECIFICATIONS. THE COST OF THE CONCRETE FOUNDATIONS SHALL BE CONSIDERED INCIDENTAL TO THE COST OF PIPE HANDRAIL.

ARLINGTON VIRGINIA

Approved: 10/3/2022
Subject to field inspection
LDA221115

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SEAL

COMMONWEALTH OF VIRGINIA
BRIAN C. GRAHAM
Lic. No. 037140
05-19-2022
PROFESSIONAL ENGINEER

APPROVALS	DATE
DESIGN TEAM ENGINEER SUPERVISOR	9/28/2022
CONSTRUCTION MANAGEMENT SUPERVISOR	10/13/22
WATER/SEWER, STREETS BUREAU CHIEF	10/5/22
TRANSPORTATION DIRECTOR Dennis M. Leach	10/5/22
PROJECT MANAGER Rens Harris	9/27/2022

REVISIONS	DATE

SHIRLINGTON ROAD PEDESTRIAN BRIDGE
BR02
SHIRLINGTON ROAD

PLAN AND ELEVATION

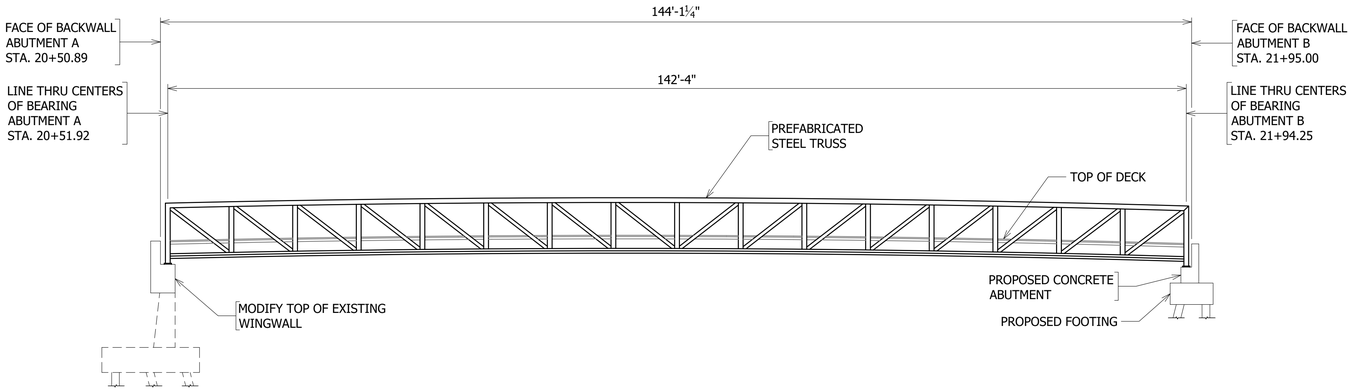
DESIGNED: DJ
DRAWN: DJ
CHECKED: AEE

PLOTTED: JULY 13 2022

SCALE:

0 10 20
GRAPHIC SCALE

B001.1



BRIDGE ELEVATION
NOT TO SCALE

NOTES:

THE SUPERSTRUCTURE SHALL BE A STEEL TRUSS BRIDGE, SIMILAR TO THE CONTECH CONNECTOR TRUSS (WWW.CONTECHES.COM) OR EQUIVALENT AS APPROVED BY THE ENGINEER.

THE TRUSS SHALL INCLUDE A WOOD DECK CONSISTING OF SOUTHERN YELLOW PINE.

THE TRUSS FABRICATOR SHALL PROVIDE A PLATE ON BRIDGE WITH LOAD CAPACITY AND DATE OF MANUFACTURE.

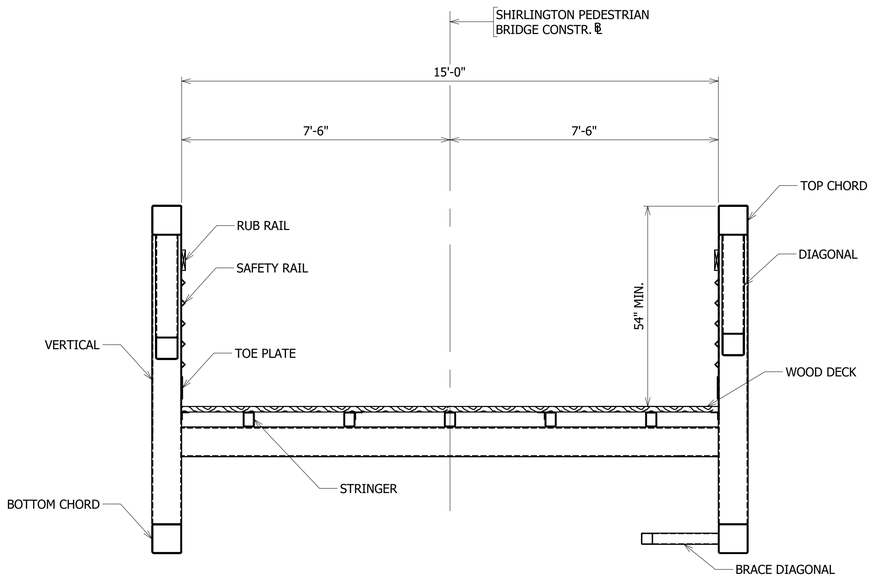
CONTRACTOR SHALL COORDINATE WITH THE TRUSS MANUFACTURER FOR BEARING DETAILS AND SHALL PROVIDE BEARING DESIGN FOR ENGINEER'S REVIEW AND APPROVAL.

THE STRUCTURE DEPTH, MEASURED FROM THE TOP OF DECK TO THE LOWEST POINT ON THE STRUCTURE, SHALL BE MAXIMUM OF 3'-6".

LOWER CHORD MEMBERS SHALL ALLOW FOR FREE DRAINAGE AND BE CONFIGURED AS TO NOT CAPTURE DEBRIS.

THE SUBSTRUCTURE IS DESIGNED AND SIZED FOR A TOTAL SUPERSTRUCTURE WEIGHT OF 112,000 LBS. SHOULD THE WEIGHT BE GREATER THAN 112,000 LBS., THE TRUSS MANUFACTURER SHALL BRING IT TO THE ATTENTION OF THE ENGINEER TO RE-EVALUATE THE DESIGN OF SUBSTRUCTURE.

ALL PREFABRICATED TRUSS COMPONENTS SHALL BE UNPAINTED WEATHERING STEEL.



BRIDGE TYPICAL SECTION
SCALE: ½" = 1'-0"

ARLINGTON VIRGINIA

Approved: 10/3/2022
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PROFESSIONAL ENGINEER

APPROVALS	DATE
DESIGN TEAM ENGINEER SUPERVISOR	9/28/2022
CONSTRUCTION MANAGEMENT SUPERVISOR	10/13/22
WATER/SEWER, STREETS BUREAU CHIEF	10/5/22
TRANSPORTATION DIRECTOR	10/5/22
PROJECT MANAGER	9/27/2022

REVISIONS	DATE

SHIRLINGTON ROAD PEDESTRIAN BRIDGE
BR02
SHIRLINGTON ROAD

BRIDGE ELEVATION AND TYPICAL SECTION

DESIGNED: DJ
DRAWN: DJ
CHECKED: AEE

PLOTTED: JULY 13 2022

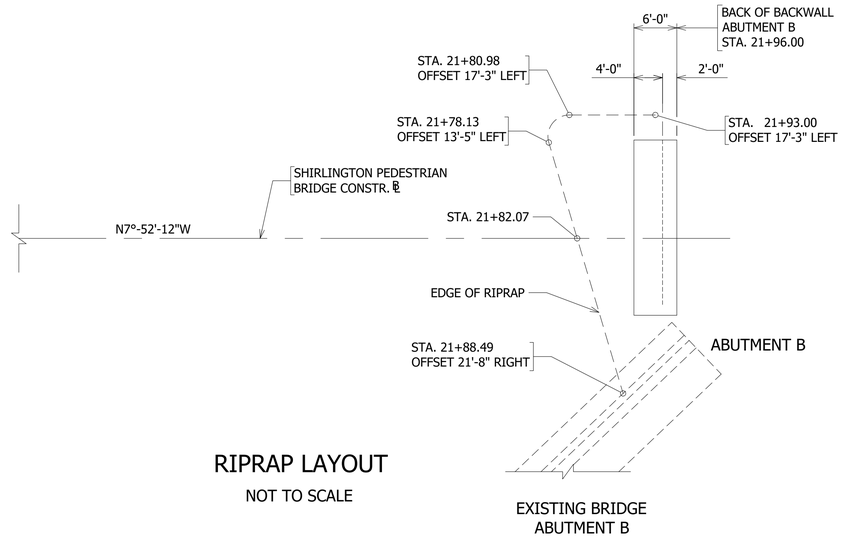
SCALE:

AS SHOWN

B001.2

REVISED ON 1/24/2022

FILENAME: BR02-BRIDGE PLANS.DWG PATH: T:\1009400 - MASTER-ARLINGTON COUNTY ON-CALL\1009450 - SHIRLINGTON RD PEDESTRIAN BRIDGE\07 DESIGN\DWG PLOTTED BY: BRENDA.DUONG



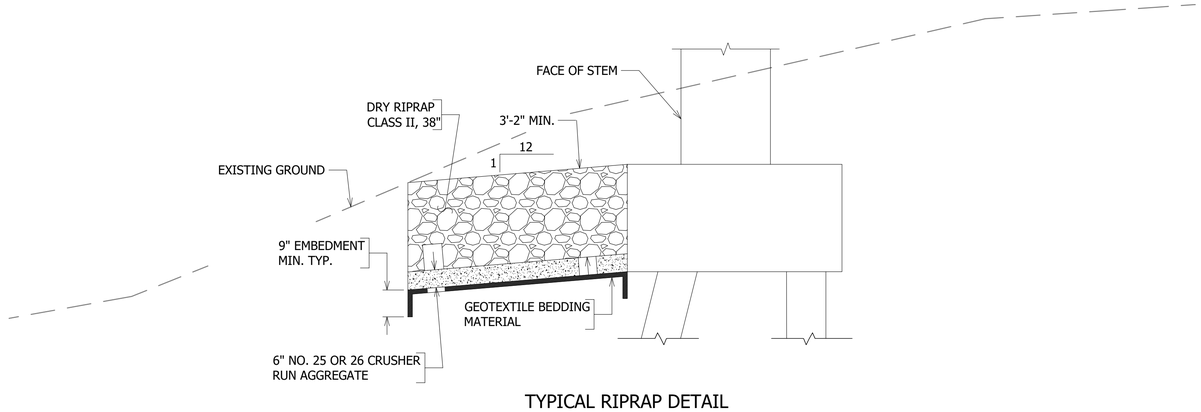
RIPRAP LAYOUT

NOT TO SCALE

NOTES:

THIS LAYOUT IS TO BE USED ONLY FOR THE PURPOSE OF LOCATING FILL SLOPES AND LIMITS OF RIP RAP SLOPE PROTECTION. FOR ABUTMENT DETAILS, SEE SHEETS B001.6 AND B001.7.

RIPRAP SHALL BE IN ACCORDANCE WITH SECTION 414 OF THE VDOT ROAD AND BRIDGE SPECIFICATIONS.



TYPICAL RIPRAP DETAIL

NOT TO SCALE

ARLINGTON VIRGINIA

Approved: 10/3/2022
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LDA221115

ARLINGTON VIRGINIA
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05-19-2022
PROFESSIONAL ENGINEER

APPROVALS	DATE
DESIGN TEAM ENGINEER SUPERVISOR	9/28/2022
CONSTRUCTION MANAGEMENT SUPERVISOR	10/13/22
WATER/SEWER, STREETS BUREAU CHIEF	10/5/22
TRANSPORTATION DIRECTOR	10/5/22
PROJECT MANAGER	9/27/2022

REVISIONS	DATE

SHIRLINGTON ROAD PEDESTRIAN BRIDGE
BR02
SHIRLINGTON ROAD

RIPRAP LAYOUT AND DETAIL

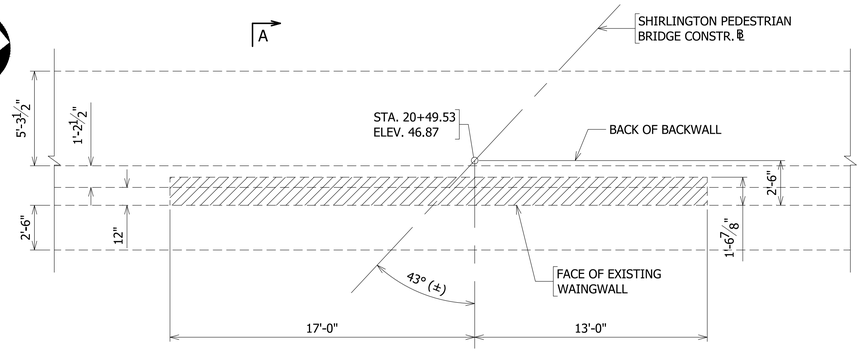
DESIGNED: DJ
DRAWN: DJ
CHECKED: AEE

PLOTTED: JULY 13 2022

SCALE:

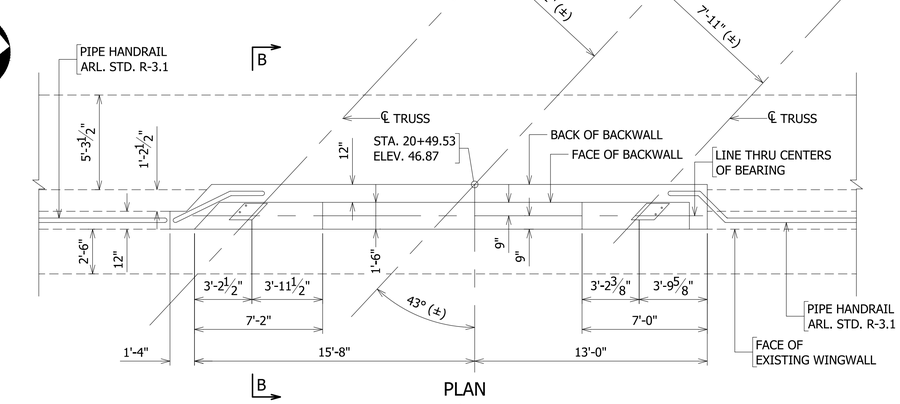
AS SHOWN

B001.3



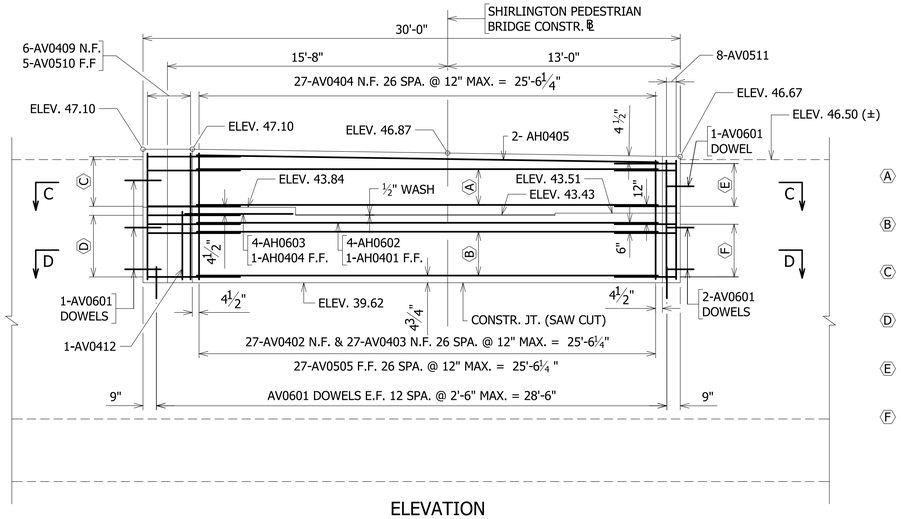
ABUTMENT DEMOLITION PLAN

SCALE: ¼" = 1'-0"



PLAN

SCALE: ¼" = 1'-0"



ELEVATION

SCALE: ¼" = 1'-0"

(PIPE HANDRAIL NOT SHOWN)

Ⓐ 3-AH0401 E.F.
2 SPA. @ 12"
= 2'-0"

Ⓑ 4-AH0401 E.F.
3 SPA. @ 10"
= 2'-6"

Ⓒ 4-AH0411 F.F. & 4-AH0412 N.F.
LAPPED WITH
AH0401 & AH0405

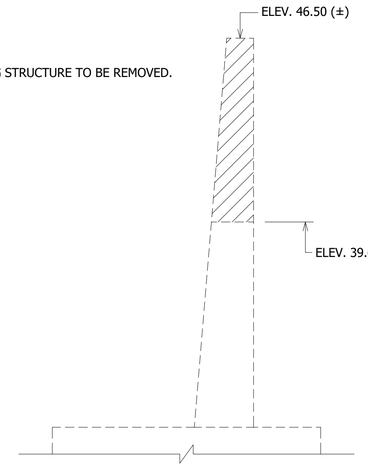
Ⓓ 6-AH0411 F.F. & 6-AH0415 N.F.
LAPPED WITH
AH0401, AH0602, AH0603 & AH0404

Ⓔ 4-AH0413 F.F. & 4-AH0414 N.F.
LAPPED WITH
AH0401 & AH0405

Ⓕ 5-AH0416
LAPPED WITH
AH0401 & AH0602

LEGEND

EXISTING STRUCTURE TO BE REMOVED.



SECTION A-A

SCALE: ⅜" = 1'-0"

NOTES:

REMOVAL OF PORTIONS OF THE EXISTING STRUCTURE SHALL BE IN ACCORDANCE WITH SECTION 413.02(b) OF THE VDOT ROAD AND BRIDGE SPECIFICATIONS.

REINFORCING STEEL EXPOSED DURING REMOVAL PROCESS SHALL BE PREPARED AS DIRECTED IN SECTION 412 OF THE VDOT ROAD AND BRIDGE SPECIFICATIONS AND SHALL LAP WITH NEW REINFORCING STEEL.

APPLY HEAVY COAT OF ASPHALT TO CONSTRUCTION JOINTS ON THE BACK FACE OF ABUTMENTS IN ACCORDANCE WITH SECTION 404.03(g) OF THE VDOT ROAD AND BRIDGE SPECIFICATIONS. COST SHALL BE CONSIDERED INCIDENTAL TO OTHER ITEMS.

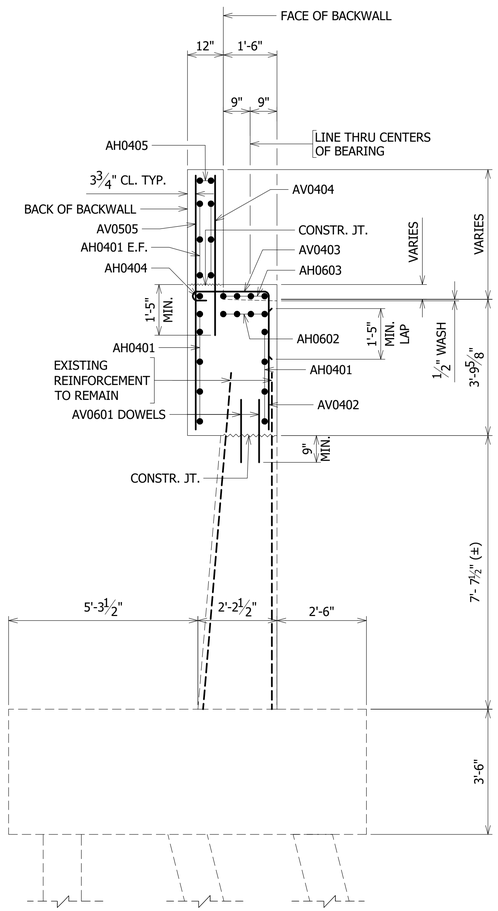
DETAILS, ELEVATIONS, AND DIMENSIONS ON THIS SHEET PERTAINING TO THE PREFABRICATED STEEL SUPERSTRUCTURE ARE APPROXIMATE AND SHALL BE VERIFIED AND/OR MODIFIED IN ACCORDANCE WITH THE APPROVED WORKING DRAWINGS FOR THE PREFABRICATED STEEL SUPERSTRUCTURE. THE CONTRACTOR SHALL SUBMIT ANY MODIFICATIONS TO THE ENGINEER FOR APPROVAL.

DOWELS SHALL BE DRILLED TO AN EMBEDMENT DEPTH OF 9 INCHES AND GROUTED WITH HIGH STRENGTH GROUT CONFORMING TO SECTION 218.03(d) OF THE VDOT ROAD AND BRIDGE SPECIFICATIONS. COST SHALL BE CONSIDERED INCIDENTAL TO OTHER ITEMS.

FOR SECTION C-C, SEE SHEET B001.5.

FOR SECTION D-D, SEE SHEET B001.5.

E.F. = EACH FACE
N.F. = NEAR FACE
F.F. = FAR FACE



SECTION B-B

SCALE: ½" = 1'-0"

ARLINGTON VIRGINIA
Approved: 10/3/2022
Subject to field inspection
LDA22115

ARLINGTON VIRGINIA
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SEAL

COMMONWEALTH OF VIRGINIA
BRIAN C. GRAHAM
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05-19-2022
PROFESSIONAL ENGINEER

APPROVALS	DATE
DESIGN TEAM ENGINEER SUPERVISOR	9/28/2022
CONSTRUCTION MANAGEMENT SUPERVISOR	10/13/22
WATER/SEWER, STREETS BUREAU CHIEF	10/5/22
TRANSPORTATION DIRECTOR	10/5/22
PROJECT MANAGER	9/27/2022

REVISIONS	DATE

SHIRLINGTON ROAD PEDESTRIAN BRIDGE
BR02
SHIRLINGTON ROAD
ABUTMENT A

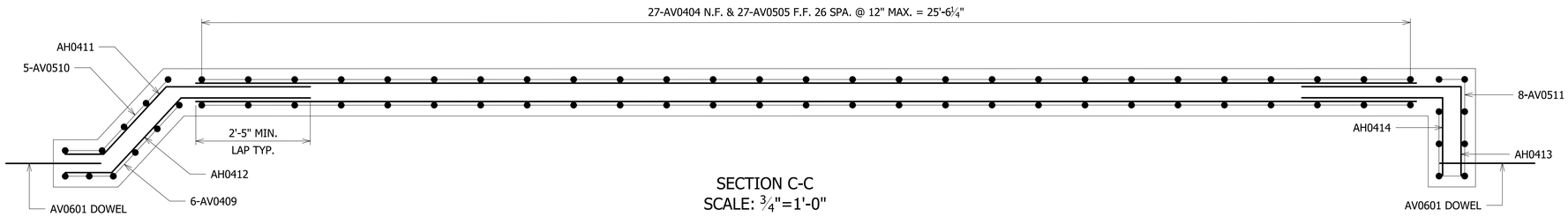
DESIGNED: DJ
DRAWN: DJ
CHECKED: AEE

PLOTTED: JULY 13 2022

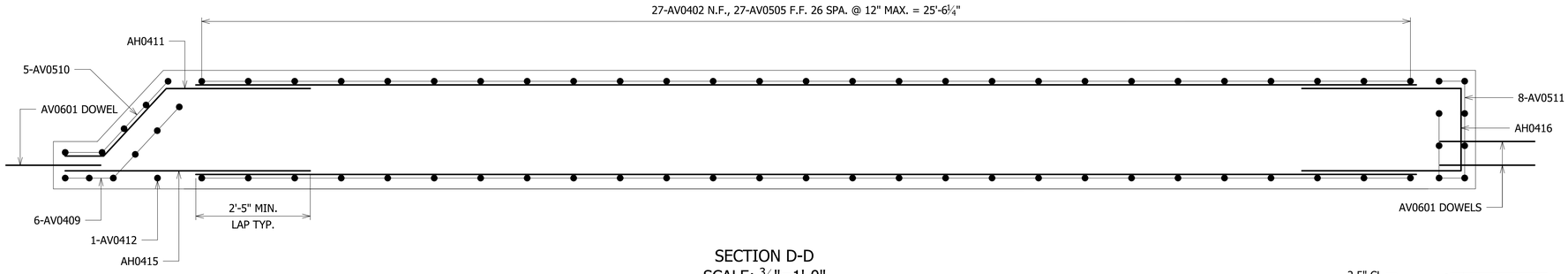
SCALE:

AS SHOWN

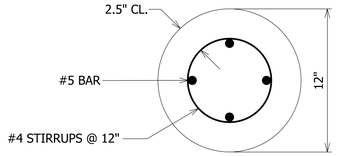
B001.4



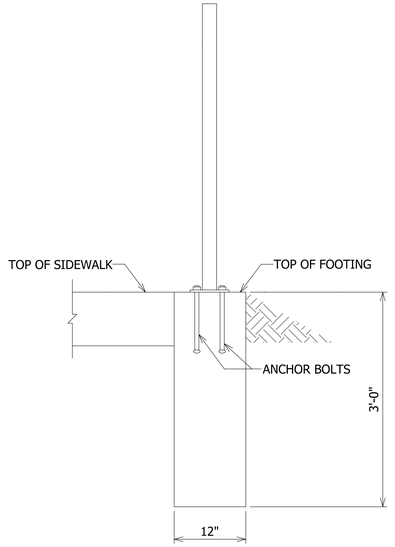
SECTION C-C
SCALE: ¾"=1'-0"



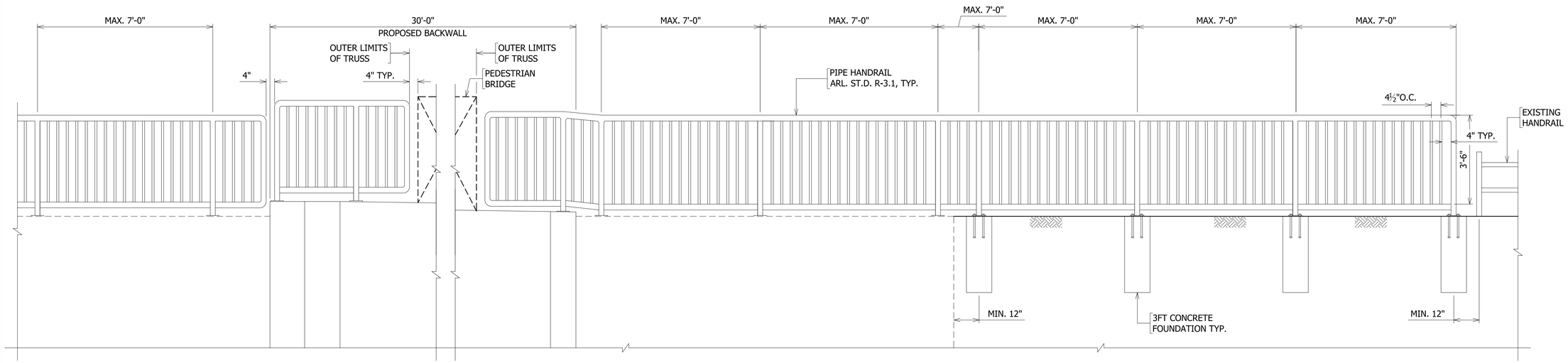
SECTION D-D
SCALE: ¾"=1'-0"



CONCRETE FOUNDATION
SECTION
NOT TO SCALE



3 FT CONCRETE FOUNDATION
SCALE: 1" = 1'-0"



DEVELOPED ELEVATION OF
PEDESTRIAN HANDRAIL
SCALE: ½" = 1'-0"

NOTES:

FOR THE LOCATION OF SECTION C-C, SEE SHEET B001.4.

FOR THE LOCATION OF SECTION D-D, SEE SHEET B001.4.

E.F. = EACH FACE
N.F. = NEAR FACE
F.F. = FAR FACE

NOTE:

THE NUMBER AND SPACING OF POSTS SHOWN IS FOR INFORMATIONAL PURPOSES ONLY. THE CONTRACTOR SHALL DETERMINE POST SPACING AND ALL DIMENSIONS AND DETAILS NECESSARY FOR INSTALLATION.

ARLINGTON VIRGINIA

Approved: 10/3/2022
Subject to field inspection
LDA22115

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SEAL

COMMONWEALTH OF VIRGINIA
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05-19-2022
PROFESSIONAL ENGINEER

APPROVALS	DATE
DESIGN TEAM ENGINEER SUPERVISOR	9/28/2022
CONSTRUCTION MANAGEMENT SUPERVISOR	10/13/22
WATER/SEWER, STREETS BUREAU CHIEF	10/5/22
TRANSPORTATION DIRECTOR	10/5/22
PROJECT MANAGER	9/27/2022

REVISIONS	DATE

SHIRLINGTON ROAD PEDESTRIAN BRIDGE
BR02
SHIRLINGTON ROAD

ABUTMENT A SECTION AND PEDESTRIAN HANDRAIL DETAILS

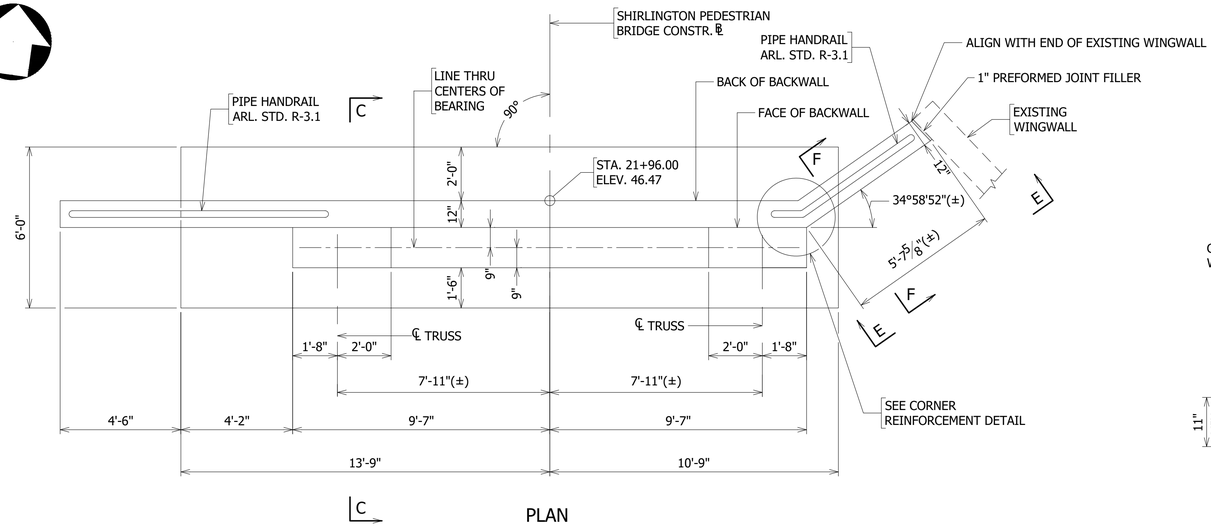
DESIGNED: DJ
DRAWN: DJ
CHECKED: AEE

PLOTTED: JULY 13 2022

SCALE:

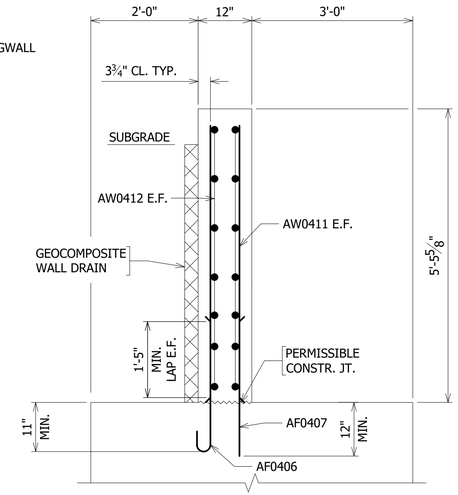
AS SHOWN

B001.5



PLAN

SCALE: 3/8" = 1'-0"



SECTION D-D

SCALE: ¾" = 1'-0"

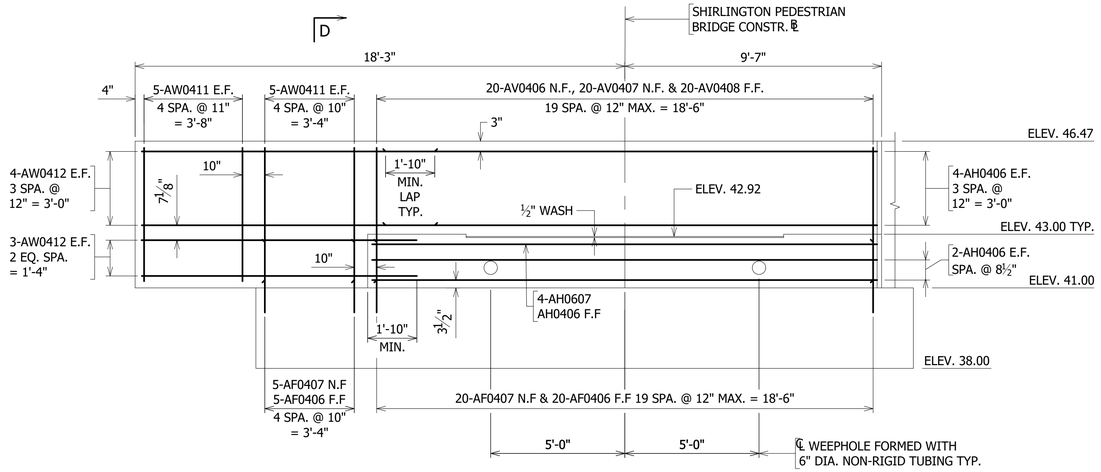
NOTES:

DETAILS, ELEVATIONS, AND DIMENSIONS ON THIS SHEET PERTAINING TO THE PREFABRICATED STEEL SUPERSTRUCTURE ARE APPROXIMATE AND SHALL BE VERIFIED AND/OR MODIFIED IN ACCORDANCE WITH THE APPROVED WORKING DRAWINGS FOR THE PREFABRICATED STEEL SUPERSTRUCTURE. THE CONTRACTOR SHALL SUBMIT ANY MODIFICATIONS TO THE ENGINEER FOR APPROVAL.

FOR VIEW E-E, SEE SHEET B001.7.

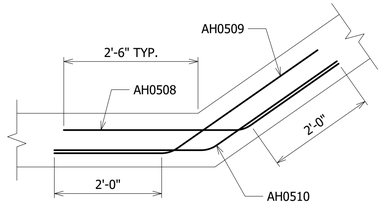
FOR SECTION F-F, SEE SHEET B001.7.

E.F. = EACH FACE
N.F. = NEAR FACE
F.F. = FAR FACE



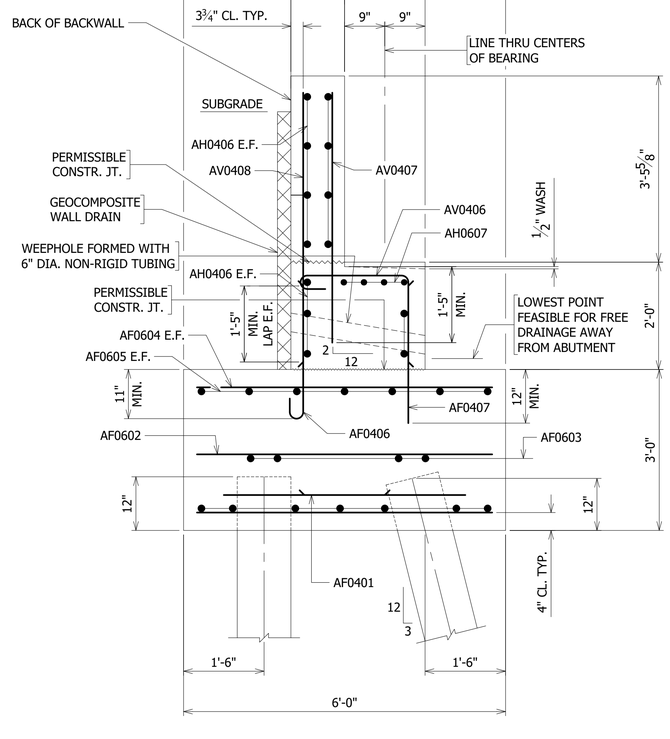
ELEVATION

SCALE: 3/8" = 1'-0"



CORNER REINFORCEMENT DETAIL

LAP BARS WITH AH0406 F.F. & AW0413 E.F.
SCALE: ¾" = 1'-0"



SECTION C-C

SCALE: ¾" = 1'-0"

ARLINGTON VIRGINIA

Approved: 10/3/2022
Subject to field inspection
LDA22115

ARLINGTON VIRGINIA
DEPARTMENT OF ENVIRONMENTAL SERVICES
FACILITIES & ENGINEERING DIVISION
ENGINEERING BUREAU
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SEAL

COMMONWEALTH OF VIRGINIA
BRIAN C. GRAHAM
Lic. No. 041140
05-19-2022
PROFESSIONAL ENGINEER

APPROVALS	DATE
DESIGN TEAM ENGINEER SUPERVISOR	9/28/2022
CONSTRUCTION MANAGEMENT SUPERVISOR	10/13/22
WATER/SEWER, STREETS BUREAU CHIEF	10/5/22
TRANSPORTATION DIRECTOR	10/5/22
PROJECT MANAGER	9/27/2022

REVISIONS	DATE

SHIRLINGTON ROAD PEDESTRIAN BRIDGE
BR02
SHIRLINGTON ROAD
ABUTMENT B

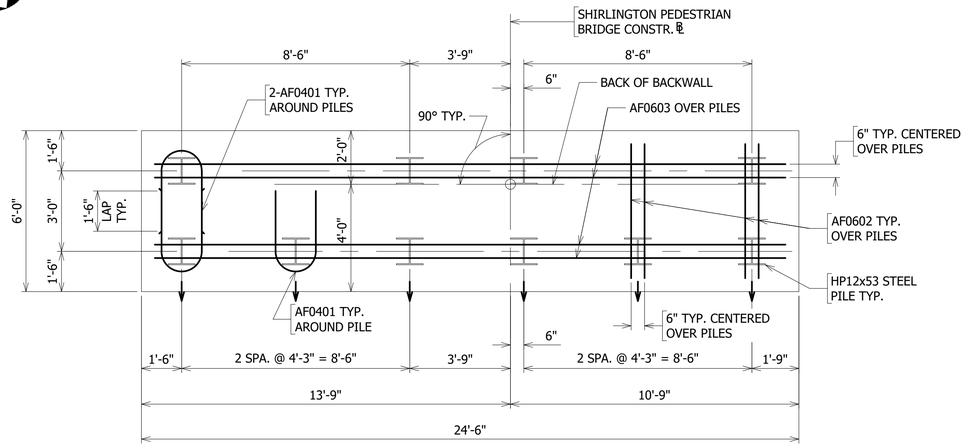
DESIGNED: DJ
DRAWN: DJ
CHECKED: AEE

PLOTTED: JULY 13 2022

SCALE:

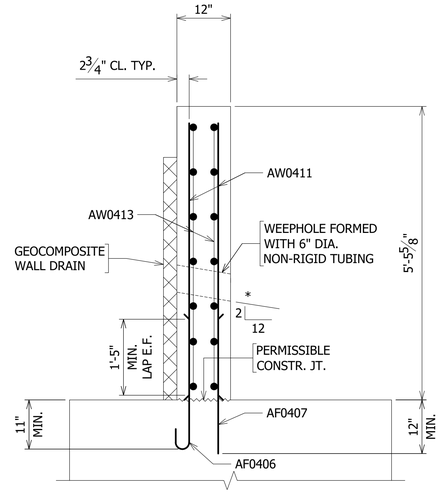
AS SHOWN

B001.6



PILE LAYOUT AND PILE REINFORCEMENT

SCALE: $\frac{3}{8}$" = 1'-0"



SECTION F-F

SCALE: $\frac{3}{4}$" = 1'-0"

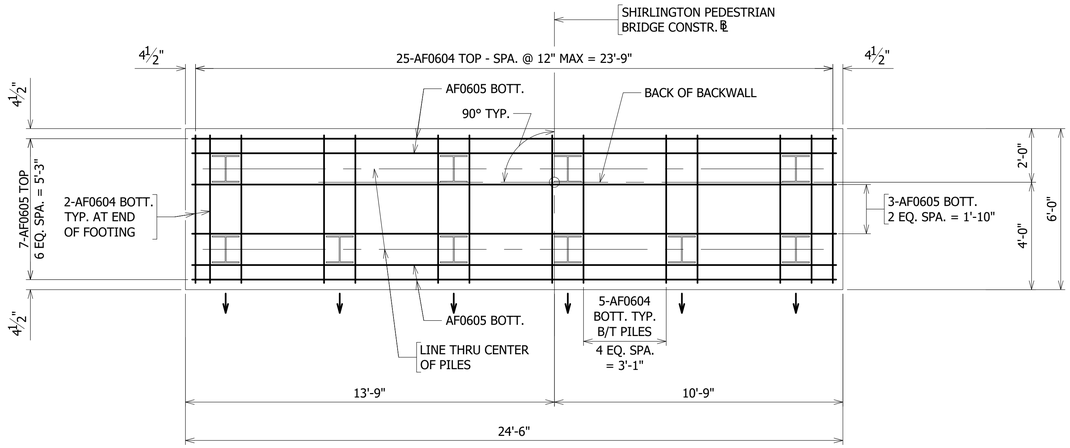
* LOWEST POINT FEASIBLE FOR FREE DRAINAGE AWAY FROM ABUTMENT.

NOTES:

FOR THE LOCATION OF VIEW E-E, SEE SHEET B001.6.

FOR THE LOCATION OF SECTION F-F, SEE SHEET B001.6.

E.F. = EACH FACE
N.F. = NEAR FACE
F.F. = FAR FACE



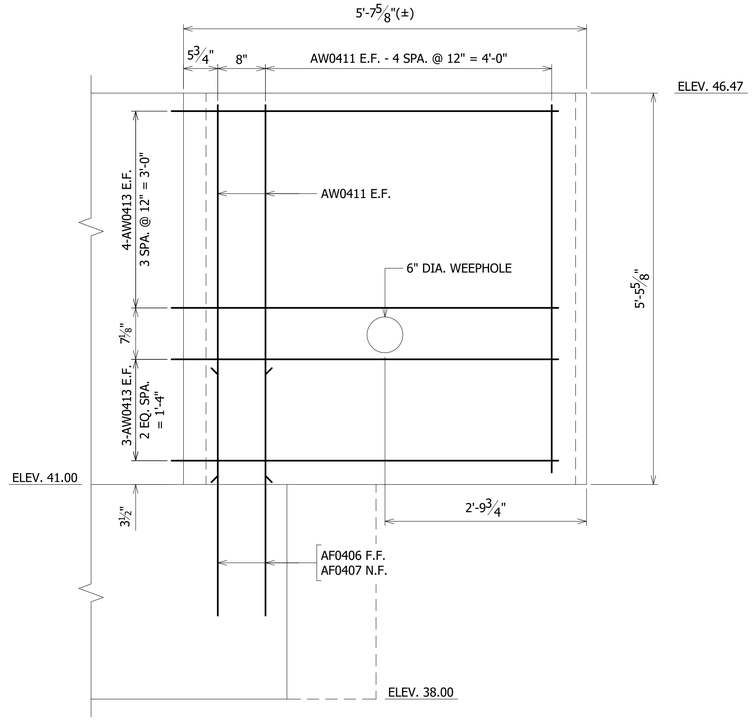
FOOTING REINFORCEMENT

SCALE: $\frac{3}{8}$" = 1'-0"

↓ INDICATES DIRECTION OF 3:12 BATTER

PILE DATA TABLE			
SUBSTRUCTURE UNIT	NOMINAL AXIAL RESISTANCE MEASURED DURING DRIVING (TONS/PILE)	FACTORED AXIAL RESISTANCE (TONS/PILE)	ESTIMATED TIP ELEVATION
ABUTMENT B	62	39	12.0

THE STRENGTH LIMIT STATE CONTROLS THE PILE DESIGN.
ONE DYNAMIC PILE TEST IS REQUIRED AND SHALL BE IN ACCORDANCE WITH SECTION 404 OF THE VDOT ROAD AND BRIDGE SPECIFICATIONS. THE TEST MAY BE PREFORMED ON A PRODUCTION PILE.



VIEW E-E

SCALE: 1" = 1'-0"

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Approved: 10/3/2022
Subject to field inspection
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WATER/SEWER, STREETS BUREAU CHIEF	10/5/22
TRANSPORTATION DIRECTOR	10/5/22
PROJECT MANAGER	9/27/2022

REVISIONS	DATE

SHIRLINGTON ROAD PEDESTRIAN BRIDGE
BR02
SHIRLINGTON ROAD

ABUTMENT B FOOTING AND WINGWALL

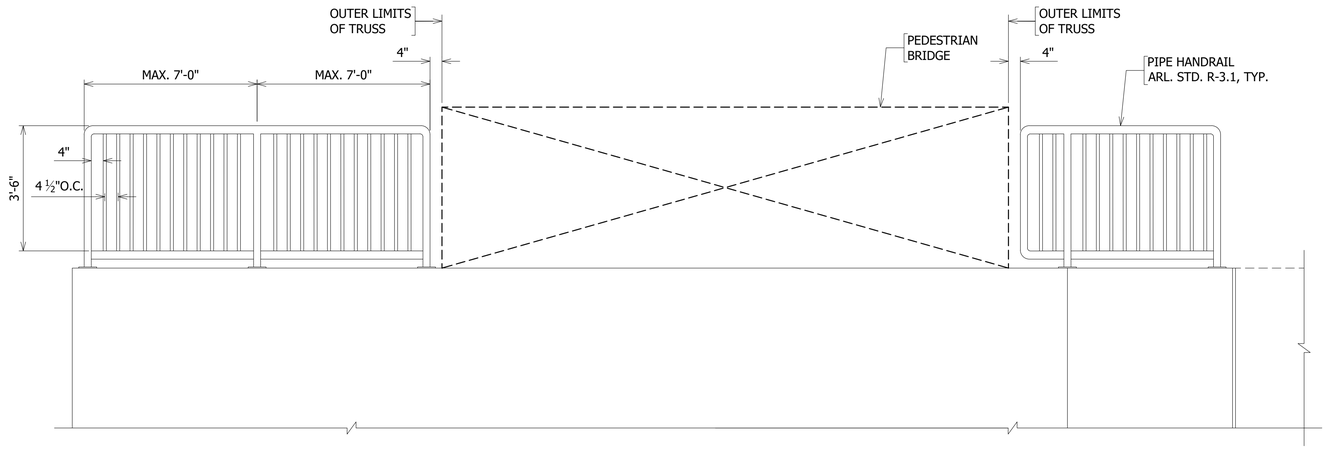
DESIGNED: DJ
DRAWN: DJ
CHECKED: AEE

PLOTTED: JULY 13 2022

SCALE:

AS SHOWN

B001.7



DEVELOPED ELEVATION OF
PEDESTRIAN HANDRAIL
SCALE: ½" = 1'-0"

NOTE:

THE NUMBER AND SPACING OF POSTS SHOWN IS FOR INFORMATIONAL PURPOSES ONLY. THE CONTRACTOR SHALL DETERMINE POST SPACING AND ALL DIMENSIONS AND DETAILS NECESSARY FOR INSTALLATION.

ARLINGTON VIRGINIA

Approved: 10/3/2022
Subject to field inspection
LDA22115

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APPROVALS	DATE
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WATER/SEWER, STREETS BUREAU CHIEF	10/5/22
TRANSPORTATION DIRECTOR	10/5/22
PROJECT MANAGER	9/27/2022

REVISIONS	DATE

SHIRLINGTON ROAD PEDESTRIAN BRIDGE
BR02

SHIRLINGTON ROAD

ABUTMENT B PEDESTRIAN HANDRAIL DETAILS

DESIGNED: DJ
DRAWN: DJ
CHECKED: AEE

PLOTTED: JULY 13 2022

SCALE:

AS SHOWN

B001.8

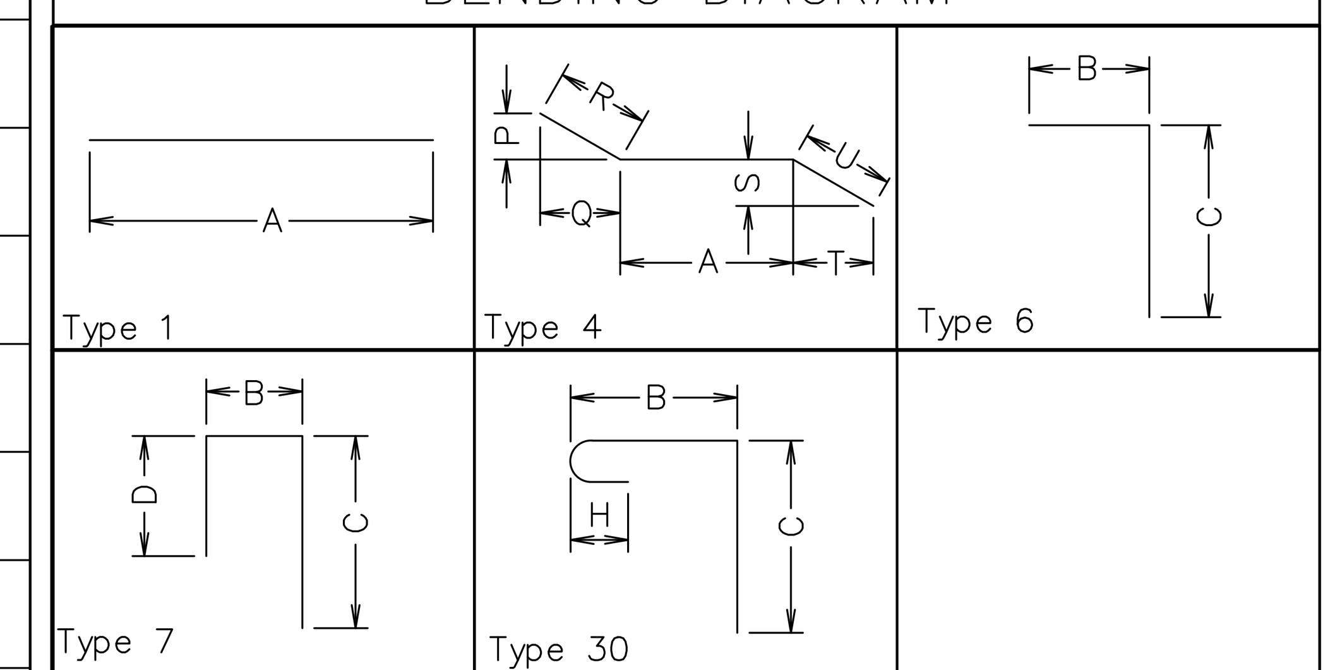
REINFORCING STEEL SCHEDULE / DIMENSION TABLE

MARK	NO.	BAR SIZE	PIN DIA. FT-IN	LENGTH FT-IN	WEIGHT (LBS.)	LOCATION	TYPE	A FT-IN	B FT-IN	C FT-IN	D FT-IN	E / P FT-IN	F / Q FT-IN	G / R FT-IN	H FT-IN	I / S FT-IN	J / T FT-IN	K / U FT-IN	L FT-IN	V FT-IN	N
				Abutment A																	
AH0401	15	4		25-09	258	Stem	1	25-09													
AH0602	4	6		25-09	155	Stem	1	25-09													
AH0603	4	6		6-03	38	Stem	1	6-03													
AH0404	1	4		5-10	4	Stem	1	5-10													
AH0405	2	4		25-09	34	Stem	1	25-09													
AH0411	10	4	3	5-10	38	Stem	4	2-00 3/4				7 3/8	6 1/2	9 5/8		2-02 1/4	2-00	2-11 3/8			
AH0412	4	4	3	5-10	15	Stem	4	2-00 3/4				8 1/4	7 1/4	10 3/4		2-01 3/8	1-11 1/4	2-10 1/8			
AH0413	4	4	3	5-02	14	Stem	6		3-04 3/8	1-10											
AH0414	4	4	3	4-07	12	Stem	6		3-01	1-07											
AH0415	6	4		5-03	21	Stem	1	5-02 1/8													
AH0416	5	4	3	8-04	28	Stem	7		1-09 1/4	3-04 3/8	3-04 3/8										
AV0601	34	6		1-06	77	Stem	1	1-06													
AV0402	27	4		3-04	60	Stem	1	3-03 3/4													
AV0403	27	4	2	4-03	77	Stem	30		1-10 1/2	2-00					4 1/2						
AV0404	27	4		4-10	87	Stem	1	4-10													
AV0505	27	5		6-10 1/4 TO 6-05 1/8	187	Stem	1	VARY													
AV0409	6	4		6-10	27	Stem	1	6-10													
AV0510	5	5		6-10	36	Stem	1	6-10													
AV0511	8	5		6-05	54	Stem	1	6-05													
AV0412	1	4		3-07	2	Stem	1	3-07													
TOTAL WEIGHT IN PRECEDING GROUP OF BARS					1223																

DIMENSION VARIATION TABLE

MARK	NO. EA. LEN.	DIMEN-SION	FROM FT-IN	TO FT-IN	VARY BY FT-IN
AV0505	1	A	6-10 1/4	6-05 1/8	0 1/4

BENDING DIAGRAM



NOTES:

Dimensions in Bending Diagram are out-to-out of bars.

Weights in schedule are based on density of 490 lb/ft.

In the Dimension Variation Table, the individual increment noted in the VARY BY column is rounded to the nearest ⅛". The fabricator shall adjust the increment ± 1/16" as needed to obtain the correct FROM and TO dimensions for each bar.

ARLINGTON VIRGINIA
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LDA22115
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WATER/SEWER, STREETS BUREAU CHIEF	10/5/22
TRANSPORTATION DIRECTOR (Dennis M. Leach)	10/5/22
PROJECT MANAGER (René Harris)	9/27/2022

REVISIONS	DATE

SHIRLINGTON ROAD PEDESTRIAN BRIDGE
BR02
SHIRLINGTON ROAD

REINFORCING STEEL SCHEDULE ABUTMENT A

DESIGNED: DJ
DRAWN: DJ
CHECKED: AEE
PLOTTED: JULY 13 2022

SCALE: N/A

B001.9

REINFORCING STEEL SCHEDULE

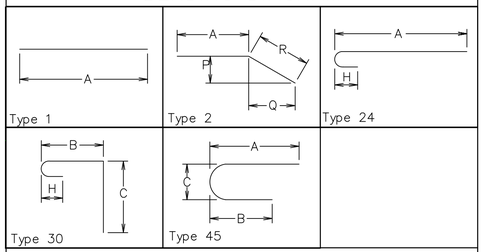
DIMENSION TABLE

MARK	NO.	BAR SIZE	PIN DIA. FT–IN	LENGTH FT–IN	WEIGHT (LBS.)	LOCATION	TYPE	A FT–IN	B FT–IN	C FT–IN	D FT–IN	E P FT–IN	F Q FT–IN	G R FT–IN	H FT–IN	I S FT–IN	J T FT–IN	K U FT–IN	L FT–IN	V FT–IN	N
				Abutment B																	
AF0401	10	4	1–05	7–04	49	FTG	45	3–03	3–03	1–06											
AF0602	12	6		5–06	99	FTG	1	5–06													
AF0603	4	6		24–00	144	FTG	1	24–00													
AF0604	29	6		5–06	240	FTG	1	5–06													
AF0605	14	6		24–00	505	FTG	1	24–00													
AF0406	27	4	3	2–10	51	FTG	24	2–04							4 1/2						
AF0407	27	4		2–06	44	FTG	1	2–05													
TOTAL WEIGHT IN PRECEDING GROUP OF BARS					1131																
AH0406	13	4		18–09	162	STEM	1	18–08													
AH0407	4	4		18–09	50	STEM	1	18–08													
AH0508	7	5	3 3/4	5–06	40	STEM/WING	2	3–04 1/4				1–03	1–09 1/4	2–01 3/4							
AH0509	7	5	3 3/4	5–06	40	STEM/WING	2	2–02				1–11	2–09	3–04							
AH0510	7	5	3 3/4	4–07	33	STEM/WING	2	1–08				1–08	2–04 1/2	2–10 5/8							
AV0406	20	4	3	4–01	54	STEM	30		2–00	1–07 3/4					4 1/2						
AV0407	20	4		4–08	62	STEM	1	4–08													
AV0408	20	4		5–03	70	STEM	1	5–03													
AW0411	32	4		5–00	107	WING	1	5–00													
AW0412	14	4		10–03	96	WING	1	10–03													
AW0413	14	4		5–08	53	WING	1	5–08													
TOTAL WEIGHT IN PRECEDING GROUP OF BARS					767																

DIMENSION VARIATION TABLE

MARK	NO. EA. LEN.	DIMEN–SION	FROM FT–IN	TO FT–IN	VARY BY FT–IN

BENDING DIAGRAM



NOTES:

Dimensions in Bending Diagram are out–to–out of bars.

Weights in schedule are based on density of 490 lb/ft.

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DESIGN TEAM ENGINEER SUPERVISOR	9/28/2022
CONSTRUCTION MANAGEMENT SUPERVISOR	10/13/22
WATER/SEWER, STREETS BUREAU CHIEF	10/5/22
TRANSPORTATION DIRECTOR	10/5/22
PROJECT MANAGER	9/27/2022

REVISIONS	DATE

SHIRLINGTON ROAD PEDESTRIAN BRIDGE
BR02
SHIRLINGTON ROAD

REINFORCING STEEL SCHEDULE ABUTMENT B

DESIGNED: DJ
DRAWN: DJ
CHECKED: AEE

PLOTTED: JULY 13 2022

SCALE:

N/A

B001.10

EXHIBIT H

Complete Streets

The street is where every element of transportation must be addressed and accommodated: pedestrians, transit, bicycles, passenger vehicles, trucks, and parking. It is also where many other aspects of public life take place including displaying civic pride, setting the tone for public activity and commerce, providing space for landscaping and accommodating storm water management and other public utilities.

The Streets Modal Element of the MTP provides guidance for achieving a greater balance among modes through the introduction of a new street typology depicted on this map and other policies that promote and enable Complete Streets. Complete Streets provide appropriate facilities to accommodate all expected transportation users and also take into account the scale and character of the streets' settings. Complete Streets do not necessarily entail dedicated facilities for each mode (e.g., transit track, bike lane, sidewalk), particularly on lower -volume streets. However, Complete Streets do ensure that travel by all modes is accommodated in a manner appropriate to the context of the street.

Complete Streets have three areas of activity: context, pedestrian space, and the travelway. The **context** of a street includes the buildings and sites adjacent to the street, or right -of-way. Land use, physical form and intensity shape the context zone. The **pedestrian space** is that which extends between the building face, or front of the private property, and the travelway. The **travelway** encompasses that portion of the public right -of-way between the curbs that is dedicated partially or exclusively to travel.

Street Typology

This map designates specific types of arterial streets. The proposed typology has been developed to shape decision-making about a given street section in terms of its planned land -use context and multi-modal function. This overlay is the principal guide for the rebalancing, redesigning and rebuilding of arterial streets to become Complete Streets that provide for all modes of travel as well as serve the adjacent land uses. More specific guidelines for improving the various designs of existing streets within each general type are set forth in the Streets Modal Element. Non-arterial (local) streets should also have designed features to complement their land -use context and function as illustrated in the table below. Arlington will also continue to use its Functional Classification of streets to guide operational and maintenance priorities . Typical elements and dimensions for each street type are illustrated in the table below. Factors such as existing and planned land -use types and intensities, right -of-way availability, travel demand, transit operations, neighborhood character, historic designations, presence of mature tre es, topography, and community concerns should be considered in the development of the final dimensions and design of any street.

	Travel Lanes*	Median Priority	Target Speed	Transit Service	Bike Accommodations	Restrict/Limit Driveway Access	On-Street Parking Priority	Pedestrian Way
Arterials								
Type A-Primarily Retail Oriented Mixed-Use	2 to 4 + Turning	None	20-25	Frequent	Bike Lane / Shared Lane	Yes	High	10-16 ft Sidewalk 6 ft Furniture Zone or Tree Pits
Type B-Primarily Urban Mixed-Use	2 + Turning (one-way) 4 + Turning (two-way)	None / Low	25-30	Frequent	Bike Lane / Shared Lane	Yes	High	6-12 ft Sidewalk 6 ft Furniture Zone or Tree Pits
Type C-Primarily Commercial Centers	4 + Turning	Medium	30	Frequent	Bike Lane	No	Low	6-8 ft Sidewalk 6 ft Green Strip
Type D-Primarily Garden Apartments & Townhouse Neighborhoods	2 to 4 + Turning	High	25-30	Moderate	Bike Lane	No	High	6-8 ft Sidewalk 5-6 ft Green Strip w / Breaks
Type E-Primarily Single-Family Residential Neighborhoods	2 to 4	None / Medium	25-30	Limited	Bike Lane / Shared Lane	No	Medium	5-6 ft Sidewalk 4-6 Green Strip
Type F-Primarily Low to Medium Density Mixed Use	4 to 6	High	35-45	Limited	Dedicated Shared Use Path	Yes	None	6 ft Sidewalk or 10 ft Shared -Use Path 8+ ft Green Strip
Non-Arterial								
Urban Center Local (medium to high density)	2	Low	25	Limited-None	Bike Lane / Shared Lane	No	High	6-8 ft Sidewalk 4-6 ft Green Strip
Neighborhood (low density)	1 1/2 to 2 (yield)	Low / None	20-25	Limited-None	Shared Lane	No	High	4-6 ft Sidewalk 2-4 ft Green Strip
Alley/Service	1 to 1 1/2 (yield)	None	10	None	Shared Lane	No	Low	None/5 ft Sidewalk limited landscaping
Transitway	2	Low / None	Varies	Frequent	Shared -Use Path	Yes	None	10-12 ft Shared-Use Paths on each side 6 ft Green Strip

*Turn Lanes as Needed

Note: The nomenclature of the typologies, found in the legend and tabl e above, is designed to help users understand the typology assignments by indicating where such street types are most commonly found. Land uses in the GLUP, other land -use plans or existing zoning designations are not meant to be affected, changed or inte rpreted based upon the name of an abutting street type.

Arlington County, Virginia
MASTER TRANSPORTATION PLAN

Adopted December 18, 2007

Updated December 2017

ARLINGTON VIRGINIA

High-Occupancy-Incentive Corridors

Selected limited access highways and Potomac River bridges are envisioned to have facilities, restrictions, fees and other measures that encourage high -occupancy travel. These measures can include High -Occupancy-Vehicle (HOV) la nes, High-Occupancy-Toll (HOT) lanes, ramp metering and congestion fees. The Streets Modal Element provides additional details.

Enhancing the Street Network

Arlington seeks to enhance the street network by discouraging the closure of existing streets, and encouraging the creation of alleyways and new local street sections, particularly where large blocks can be broken up, and where pedestrians can be provided with better access or fewer vehicular conflicts.

Certain areas are identified on this map as locations where the construction of new streets t o improve the connectivity of the existing street network is expected as part of planned development. New connecting street s are also routinely sought through public investment or private devel opment on an ongoing basis where they are appropriate. In either case specific alignment and street design is determined through more detailed planning processes. The Streets Modal Element provides additional details.

About Arlington

As of January 2016

Land

Land Area	25.8 Square Miles (66.82 Square Kilometers)
Highest Elevation	460 Feet (140.3 meters) above Sea Level

Population and Employment

Total Population, 2000 U.S. Census	189,453
Total Population, 2010 U.S. Census	207,627
Estimated Population, January 2016	220,400
Estimated Average Household Size, 2010 Census	2.09 persons
Estimated At-Place-Employment, Jan. 2016*	211,000 Jobs (100%)**
Construction	3,900 (1.9%)
Retail Trade	10,000 (4.8%)
Transportation and Warehousing	9,500 (4.5%)
Information	5,600 (2.7%)
Finance and Insurance	6,800 (3.2%)
Real Estate and Rental/Leasing	7,800 (3.7%)
Professional and Technical Services	45,100 (21.4%)
Hospitality and Food Services	16,200 (7.7%)
Other Services	49,200 (23.3%)
Government	58,500 (23.0%)
All Other	8,400 (4.0%)
Estimated Daytime Population, 2016	288,000

* At-place employment refers to jobs located in Arlington.
** Figures may not sum due to rounding.
Source: Arlington County Planning Division January 2016 estimates.

Development

Total Dwelling Units, 2000 U.S. Census*	90,426
Total Dwelling Units, 2010 U.S. Census*	105,404
Estimated Dwelling Units, January 2016**	112,300
Rentable Building Area in Square Feet, January 2016***	40,812,259
Total Hotel Rooms, 2016 estimate****	10,857

Sources:
* U.S. Census Bureau
** CPHD, Planning Division, Urban Design and Research Section
*** CoStar
**** Arlington Economic Development

Other Planning Documents

Arlington County Profile (June 2016)
Annual and Quarterly Development Tracking Reports (2015)

Legend

Arterial-Street Typologies
- Type A
- Type B
- Type C
- Type D
- Type E
- Type F

Neighborhood Streets
- Urban Center Local
- Residential or Commercial Local Street
- Shared Street
- Pedestrian Priority Street

Limited-Access Routes

High-Occupancy-Incentive Corridors
I-66, I-395, VA Rte. 110, VA Rte. 27

Public Transportation Facilities
- Metro Blue Line
- Metro Orange Line
- Metro Yellow Line
- Metro Silver Line
- Railroad

Public Parks

Federal-Owned Lands

Bicycle/Pedestrian Trails
- 1 Existing Major Trail Projects
- 2 Planned Major Trail Projects

Transit Facilities
- 1 Existing/Completed Transit Projects
- 2 Planned Transit Projects

Intersection/Bridge Roadways
- 1 Existing/Completed Projects
- 2 Planned Roadway Projects

Key Facilities and Improvements

Bicycle/Pedestrian Facilities
1. W & OD Trail
2. Mt. Vernon Trail
3. Custis Trail
4. Arlington Blvd. Trail
5. Four Mile Run Trail
6. Bluemont Junction Trail
7. Four Mile Run Trail Crossing of I-395
8. Boundary Channel Bridge Underpass
9. North Tract/Mt. Vernon Trail Connection
10. Washington Blvd. West Side Trail
11. Arlington Blvd. South Side Trail
12. Route 110 South Trail
13. Columbia Pike Bike Boulevards
14. Iwo Jima Memorial Connection to Roosevelt Bridge
15. Four Mile Run Bridge
16. Rosslyn Circle Tunnel
17. Potomac Yard to Four Mile Run Trail Connector
18. Ballston Bike Station
19. Bluemont Park to Upton Hill Park Trail
20. Bike Share Stations (see MTP Bicycle Element Appendix F for additional detail)

Areas Planned for New Streets
1. Pentagon City/Metropolitan Park Area
2. Clarendon Commercial Area
3. Rosslyn-Courthouse Area
4. Columbia Pike West End
5. Columbia Pike / Town Center
6. Columbia Pike / Four Mile Run Drive Central
7. Nauck Revitalization Area
8. Virginia Square / 9th St.
9. N. Quincy Street Plan Addendum (West Ballston)
10. Crystal City Redevelopment
11. Buckingham Redevelopment
12. Columbia Pike East
13. Washington Blvd. / Kirkwood Rd.

Transit Facilities
1. WMATA Bus Garage
2. Crystal City/Potomac Yard Transitway
3. Shirlington Bus Station
4. Ballston-MU Metro Rail Station West Entrance & Multimodal Improvements M
5. Rosslyn Metro Rail Station Improvements M
6. Courthouse Metro Rail Station Second Elevator M
7. Pentagon City Metro Station Second Elevator M
8. East Falls Church Metro Station Access Improvements M
9. ART Light Maintenance Facility
10. Clarendon Metro Rail Station Plaza & Bicycle Parking Improvements M
11. Crystal City Metro Rail Station Improvements & East Entrance VRE
12. Crystal City Multimodal Improvements
13. Pentagon City Pedestrian Tunnel
14. Pentagon City Multimodal Improvements
15. Transitway Expansion to Pentagon City
16. Shirlington Bus Station Expansion
17. Courthouse Metro Rail Station Canopy and Escalator Entrance
18. Transit Stations

Intersection + Bridge Roadway Improvements
1. Clarendon Circle/Washington Blvd.
2. Lee Hwy./N. Harrison St. (left-turn lanes)
3. Glebe Rd. (left-turn lanes) at Lee Hwy.
4. Columbia Pike/Four Mile Run Dr.
5. Columbia Pike/Washington Blvd.
6. Arlington Blvd./Washington Blvd.
7. Arlington Blvd./Courthouse Rd./10th St.
8. Glebe Rd./Arlington Blvd.
9. S. Glebe Rd./Interstate 395
10. S. Glebe Rd./Arlington Ridge Rd. (left-turn lanes)
11. Marshall Dr./Route 110 (merge lane)
12. N. Glebe Rd. (Fairfax Dr./Wilson Blvd./Carlin Springs Rd.)
13. N. Meade St./Arlington Blvd. (Route 50) bridge rebuild
14. Long Bridge Drive/Interstate 395 interchange rebuild
15. N. Carlin Springs Rd./N. George Mason Dr. bridge replacement
16. Shirlington Rd./S. Four Mile Run Dr. bridge replacement
17. Washington Blvd. (Route 27)/Jefferson Davis Hwy. (Route 110) bridge rebuild
18. Columbia Pike Multimodal

Block Numbers on Numbered Streets

200	Ball	2000	Taft	3700	Nelson	5400	Harrison
300	Clark	2100	Uhle	3800	Oakland	5500	Illinois
400	Dale	2200	Veitch	3900	Pollard	5600	Jefferson
500	Eads	2300	Wayne	4000	Quincy	5700	Kensington
600	Fern	2400	Adams	4100	Randolph	5800	Lexington
700	Grant	2500	Barton	4200	Stafford	5900	Madison
800	Hayes	2600	Cleveland	4300	Taylor	6000	Nottingham
900	Ives	2700	Danville	4400	Utah	6100	Ohio
1000	Joyce	2800	Edgewood	4500	Vermont	6200	Powhatan
1100	Kent	2900	Fillmore	4600	Wakefield	6300	Quantico
1200	Lynn	3000	Garfield	4700	Abingdon	6400	Roosevelt
1300	Meade	3100	Highland	4800	Buchanan	6500	Sycamore
1400	Nash	3200	Irving	4900	Columbus	6600	Tuckahoe
1500	Oak	3300	Jackson	5000	Dinwiddie	6700	Underwood
1600	Pierce	3400	Kenmore	5100	Edison	6800	Van Buren
1700	Queen	3500	Lincoln	5200	Frederick	6900	Westmoreland
1800	Rolfe	3600	Monroe	5300	Greenbrier	7000	Arizona
1900	Scott						

South and West Sides are Even Address Numbers

Map prepared by GIS Mapping Center
2100 Clarendon Blvd., Suite 813
Arlington, VA 22201
Email: gismc@arlingtonva.us

Spatial reference: Virginia State Plane North, NAD 1983.
Base map updated from April 2015 digital aerial photography.
Potomac River from USGS 1:24,000 DLG files.
Cadastral and political data layers are maintained on an on-going basis.
Master Transportation Plan data effective through December 2017.

Map © 2017 Arlington County, VA
Printed: December 2017

SCALE IN FEET
0 1,200 2,400 3,600

SCALE IN MILES
0 0.25 0.5 0.75 1

FRONT

Master Transportation Plan

Introduction

This Arlington Master Transportation Plan (MTP) promot es effective travel and accessibility for the County's residents, workers, and visitors through the year 2030. It provides a framework to guide the development of projects and programs, advance the County's goals and objectives, and help direct investment. Its policies affect how people travel, however they travel. As Arlington continues to grow, the MTP plays an important part in determining how the County will accommodate that growth. The MTP is comprised of three major components: this map, a Goals and Policies document, and six detailed mode -specific documents.

About this Map

The focus of this map is to provide visual guidance on the planned Arlington street system and to geograp hically locate the major transportation facility investments identified in the plan including streets, transit and bicycle facilities. Greater detail about the background of the transportation system and plan goals, policies and objectives, is found in the other components of the MTP.

Specific maps for the Transit and Bikeways networks are included to illustrate how existing and proposed facilities will integrate to create enhanced networks. Additional details on facilities can be found in the Transit and Bicycle Modal Elements.

Facilities for pedestrians, parking, and transportation demand and systems management are not included on this map as they are difficult to illustrate on a map of this scale. The respective modal elements of the MTP provide additional details, policies and design standards.

Arlington County Transit Network

Legend

Limited-Access Routes

High-Occupancy-Incentive Corridors

Neighborhood Streets
- Other Streets
- Pedestrian Priority Streets

Flexible Transit Zones

Public Parks

Federal-Owned Lands

Potomac River

Transit Networks
- Transit Stations - Existing and Proposed
- Premium Transit Network
- Express Bus Corridor
- Primary Transit Network
- Secondary Transit Network

Public Transportation Facilities
- Existing
- Planned
- Virginia Railway Express
- Metro Station
- Metro Blue Line
- Metro Orange Line
- Metro Silver Line
- Metro Yellow Line

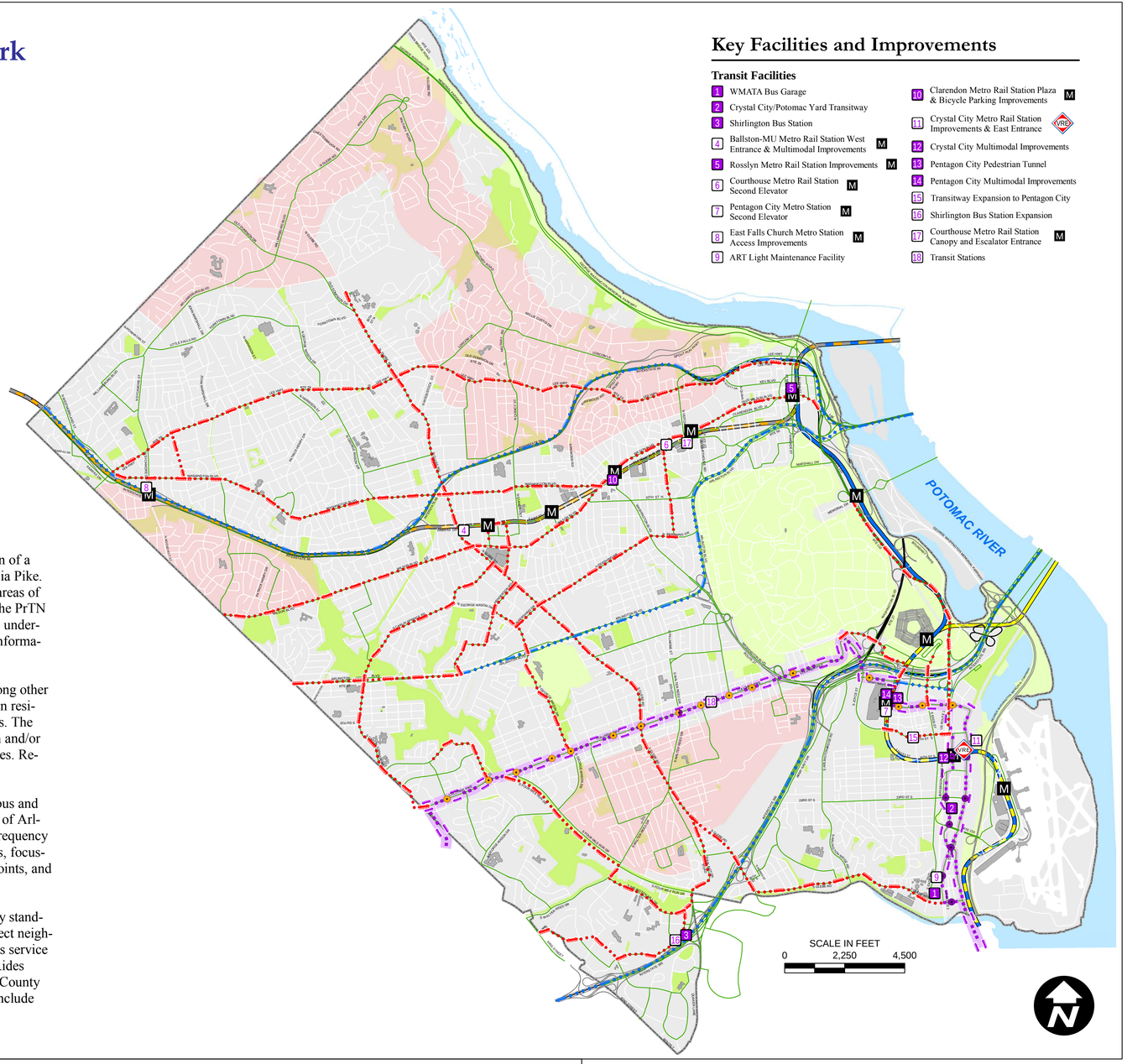
Transit

A key aspect of the Master Transportation Plan is the implementation of a Premium Transit Network (PrTN) in Crystal City and along Columbia Pike. The PrTN is designed to add capacity and encourage investment in areas of the County where significant growth and development is planned. The PrTN features high frequency (every 10-12 minutes), branded, and easy to understand bus routes with passenger amenities such as real-time transit information and high quality transit stations.

In addition, the expansion of the Primary Transit Network (PTN) along other primary development corridors will provide the majority of Arlington residents with all-day east-west and north-south access every 15 minutes. The PTN may be expanded further in future updates if parts of Arlington and/or adjacent communities are redeveloped at substantially higher densities. Regional express bus routes also complement PTN service.

The Secondary Transit Network (STN) offers more localized Metrobus and ART service. The STN serves the low- to moderate-density portions of Arlington and adjacent communities. The STN routes do not have the frequency or capacity of the PTN, but penetrate deeper into lower-density areas, focusing on bringing people to Metrorail stations, other service transfer points, and serving important neighborhood destinations.

In areas of the County where STN service does not meet productivity standards, the County will institute a flexible, on-demand service to connect neighborhoods with transit stations or key neighborhood destinations. This service will use smaller vehicles and could include a separate fare system. Rides would be grouped and provided on a demand-responsive basis. The County will pilot this service during off-peak periods but may expand it to include service during peak periods as well.



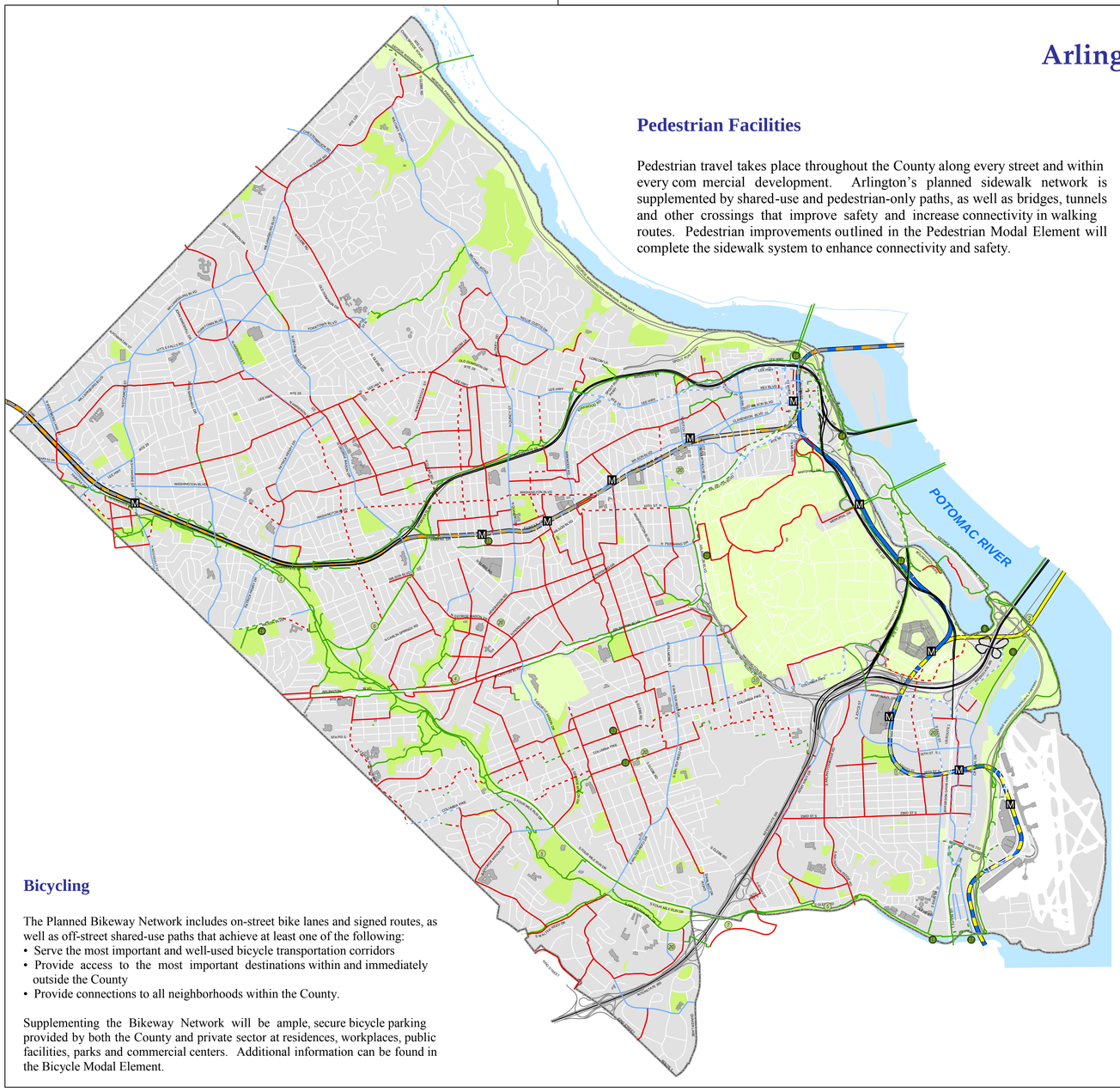
Key Facilities and Improvements

Transit Facilities
1. WMATA Bus Garage
2. Crystal City/Potomac Yard Transitway
3. Shirlington Bus Station
4. Ballston-MU Metro Rail Station West Entrance & Multimodal Improvements (M)
5. Rosslyn Metro Rail Station Improvements (M)
6. Courthouse Metro Rail Station Second Elevator (M)
7. Pentagon City Metro Station Second Elevator (M)
8. East Falls Church Metro Station Access Improvements (M)
9. ART Light Maintenance Facility
10. Clarendon Metro Rail Station Plaza & Bicycle Parking Improvements (M)
11. Crystal City Metro Rail Station Improvements & East Entrance (VRE)
12. Crystal City Multimodal Improvements
13. Pentagon City Pedestrian Tunnel
14. Pentagon City Multimodal Improvements
15. Transitway Expansion to Pentagon City
16. Shirlington Bus Station Expansion
17. Courthouse Metro Rail Station Canopy and Escalator Entrance (M)
18. Transit Stations

Arlington County Bike and Trail Network

Pedestrian Facilities

Pedestrian travel takes place throughout the County along every street and within every com mercial development. Arlington's planned sidewalk network is supplemented by shared-use and pedestrian-only paths, as well as bridges, tunnels and other crossings that improve safety and increase connectivity in walking routes. Pedestrian improvements outlined in the Pedestrian Modal Element will complete the sidewalk system to enhance connectivity and safety.



Bicycling

The Planned Bikeway Network includes on-street bike lanes and signed routes, as well as off-street shared-use paths that achieve at least one of the following:
- Serve the most important and well-used bicycle transportation corridors
- Provide access to the most important destinations within and immediately outside the County
- Provide connections to all neighborhoods within the County.

Supplementing the Bikeway Network will be ample, secure bicycle parking provided by both the County and private sector at residences, workplaces, public facilities, parks and commercial centers. Additional information can be found in the Bicycle Modal Element.

Legend

Limited-Access Routes

High-Occupancy-Incentive Corridors

Neighborhood Streets
- Other Streets
- Pedestrian Priority Streets

Public Transportation Facilities
- Metro Station
- Metro Blue Line
- Metro Orange Line
- Metro Silver Line
- Metro Yellow Line

Potomac River

On Street Bike Lanes
- Existing Bike Lanes
- Planned Bike Lanes

On Street Bike Facilities
- Existing Bikeway
- Planned Bikeway

Off Street Trail Network
- Existing Trails
- Planned Trail Projects

Public Parks

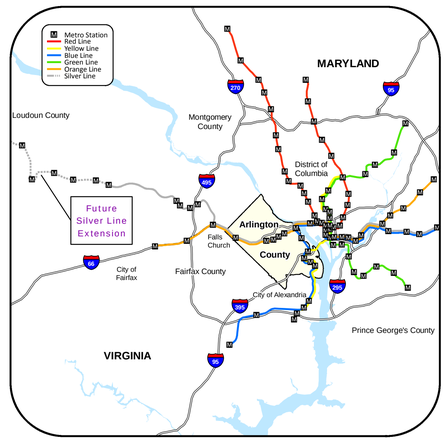
Federal-Owned Lands

Key Facilities and Improvements

Bicycle/Pedestrian Facilities
Note: Trails shown on Columbia Island (D.C.) are for displaying connectivity

1. W & OD Trail
2. Mt. Vernon Trail
3. Custis Trail
4. Arlington Blvd. Trail
5. Four Mile Run Trail
6. Bluemont Junction Trail
7. Four Mile Run Trail Crossing of I-395
8. Boundary Channel Bridge Underpass
9. North Tract/Mt. Vernon Trail Connection
10. Washington Blvd. West Side Trail
11. Arlington Blvd. South Side Trail
12. Route 110 South Trail
13. Columbia Pike Bike Boulevards
14. Iwo Jima Memorial Connection to Roosevelt Bridge
15. Four Mile Run Bridge
16. Rosslyn Circle Tunnel
17. Potomac Yard to Four Mile Run Trail Connector
18. Ballston Bike Station
19. Bluemont Park to Upton Hill Park Trail
20. Bike Share Stations (see MTP Bicycle Element Appendix F for additional detail)

Map of Metrorail System



Map prepared by GIS Mapping Center
2100 Clarendon Blvd., Suite 813
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Email: gismc@arlingtonva.us

Spatial reference: Virginia State Plane North, NAD 1983.
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Potomac River from USGS 1:24,000 DLG files.
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Master Transportation Plan data effective through December 2017.

Printed: December 2017

BACK

EXHIBIT I

Arlington County, VA Materials Testing Specification Reference (September 2020)

MATERIAL AND TEST (*REF. - VDOT TEST METHODS MANUAL)*	VDOT ROAD AND BRIDGE SPECIFICATION 2002 (*Or Latest Version)*	MINIMUM RATE OF SAMPLING (*REF. - VDOT MANUAL OF INSTRUCTIONS)*	LOCATION OF SAMPLING	REMARKS
SOILS AND AGGREGATES				
1. Embankments				
(a) Density, Any Method	303.04(h)	One (1) test per 2500 yd3 or less plus: (a) for fills less than 500 ft. length one (1) test on every other 6-in. layer bottom to top of fill starting with the second lift; (b) for fills from 500-2000 ft. length, two (2) tests per 6-in. layer within top five (5) ft. of fill; (c) for fills greater than 2000 ft length, break into equal segments not to exceed 2000 ft. and use same frequency for each section as for fills 500 to 2000 ft. in length.	Roadway	When tests are not run due to gravel, muck, rock, etc. give station and depth on report in lieu of test, with reason. For nuclear test, use Direct Transmission Method, VTM-10. See Notes 1 and 2.
2. Finished Sub-grade (Both Cut and Fill Sections)				
(a) Density, Any Method	305.03	One (1) test per 2000 continuous linear ft. of roadway and one test minimum per intersection per construction location	Roadway (24 ft.)	For nuclear test, use Direct Transmission Method, VTM-10. See Notes 1 and 2.

Arlington County, VA Materials Testing Specification Reference (September 2020)

MATERIAL AND TEST (*REF. - VDOT TEST METHODS MANUAL)*	VDOT ROAD AND BRIDGE SPECIFICATION 2002 (*Or Latest Version)*	MINIMUM RATE OF SAMPLING (*REF. - VDOT MANUAL OF INSTRUCTIONS)*	LOCATION OF SAMPLING	REMARKS
(b) Density, Any Method	305.03	One (1) test per continuous section/block/or intersection	Curb, Comb. Curb and Gutter	For nuclear test, use Direct Transmission Method, VTM-10. See Notes 1 and 2.
(c) Density, Any Method	305.03	One (1) test per continuous section/block/or intersection	Sidewalk	For nuclear test, use Direct Transmission Method, VTM-10. See Notes 1 and 2.
3. Central Mix Aggregate (Treated or Un-treated) Base, Subbase, and Select Material				
(a) Density, Any Method	305.03, 308.03, & 309.05,	One (1) test per 1/2 mile or less per continuous lane application width per layer. If testing by nuclear method, each test shall consist of average of five (5) readings.	Roadway. Location of five (5) nuclear readings at randomly selected sites.	For nuclear tests, use Backscatter, Control Strip Method, VTM-10. With nuclear method, set up roller pattern and control strip for each layer or lift placed. See Notes 1 and 2.
(b) Density, Any Method	305.03, 308.03, & 309.05,	One (1) test per continuous section/block/or intersection	Curb, Comb. Curb and Gutter	For nuclear test, use Direct Transmission Method, VTM-10. See Notes 1 and 2.
(c) Density, Any Method	305.03, 308.03, & 309.05,	One (1) test per continuous section/block/or intersection	Sidewalk	For nuclear test, use Direct Transmission Method, VTM-10. See Notes 1 and 2.

Arlington County, VA Materials Testing Specification Reference (September 2020)

MATERIAL AND TEST (*REF. - VDOT TEST METHODS MANUAL)*	VDOT ROAD AND BRIDGE SPECIFICATION 2002 (*Or Latest Version)*	MINIMUM RATE OF SAMPLING (*REF. - VDOT MANUAL OF INSTRUCTIONS)*	LOCATION OF SAMPLING	REMARKS
4. Backfill for Pipes and Box Culverts	302.03, 303.04(g), 401.03(i)	Minimum one test per lift on alternating sides of pipe for each 300 feet of pipe or portion thereof. Test pattern is to begin after first 4" compacted layer above the structures bedding and continue to 1' above top of pipe or box culvert structure. For rate of testing greater than 1' above top of pipe refer to contract documents and Rate of Sampling for embankments.	Alternating sides of structure	For nuclear test, use Direct Transmission Methods, VTM-10. See Notes 1 and 2. Backfill lifts shall be compacted in horizontal layers not more than 6 inches in thickness, loose measurement. (Or as Specified by the Contract Documents)
5. Backfill for Drop Inlets	302.03, 303.04(g)	Minimum one test every other lift around the perimeter beginning after the first 4" compacted layer above the bedding and continue to top of the structure. Stagger tests to ensure consistent compaction effort has been achieved.	Perimeter of structure	To include drop inlets, junction boxes, etc. For nuclear test, use Direct Transmission Methods, VTM-10. See Notes 1 and 2. Backfill lifts shall be compacted in horizontal layers not more than 6 inches in thickness, loose measurement. (Or as Specified by the Contract Documents)
6. Backfill for Manholes	302.03, 303.04(g)		Perimeter of structure	For nuclear test, use Direct Transmission Methods, VTM-10. See Notes 1 and 2. Backfill lifts shall be compacted in horizontal layers not more than 6 inches in thickness, loose measurement. (Or as Specified by the Contract Documents)

Arlington County, VA Materials Testing Specification Reference (September 2020)

MATERIAL AND TEST (*REF. - VDOT TEST METHODS MANUAL)*	VDOT ROAD AND BRIDGE SPECIFICATION 2002 (*Or Latest Version)*	MINIMUM RATE OF SAMPLING (*REF. - VDOT MANUAL OF INSTRUCTIONS)*	LOCATION OF SAMPLING	REMARKS
HYDRAULIC CEMENT CONCRETE				
1. Sidewalk, Curb, Comb. Curb and Gutter				
(a) Temperature Measurements	217	One test per batch (truck), and when making compressive specimens.	At job site, and prior to placing concrete in forms.	If test on any batch fails, recheck batch immediately before rejecting. Enter results of tests in project records.
(b) Air Content	217	One test per batch (truck), and when making compressive specimens	At job site, and prior to placing concrete in forms	Any of 3 approved methods may be used for this test. However, with any test method used, with readings indicating concrete to be outside of specification must be confirmed first with test by Pressure Method before rejection of concrete. Enter results in project records.
(c) Consistency (Slump Test).	217	One test per batch (truck), and when making compressive specimens.	At job site, and prior to placing concrete in forms.	If test on any batch fails, recheck batch immediately before rejecting. Enter results in project records.

Arlington County, VA Materials Testing Specification Reference (September 2020)

MATERIAL AND TEST (*REF. - VDOT TEST METHODS MANUAL)*	VDOT ROAD AND BRIDGE SPECIFICATION 2002 (*Or Latest Version)*	MINIMUM RATE OF SAMPLING (*REF. - VDOT MANUAL OF INSTRUCTIONS)*	LOCATION OF SAMPLING	REMARKS
(d) Compressive Strength...	217	For <u>miscellaneous concrete,</u> one set of 3 cylinders shall be made for each 250 cubic yards, with a minimum of one set of 3 per day. Any one set to be made from same batch. For <u>structural concrete,</u> one set of 3 cylinders shall be made for each 100 cubic yards of concrete placed, with a minimum of 2 sets of 3 cylinders each per structure per class of concrete. Any one set to be made from same batch.	At job site.	<u>Molding and Curing</u> Molds shall be placed on a rigid horizontal surface free from vibration and other disturbances during the first 24 hours, all test specimens shall be stored under conditions that maintain the temperature immediately adjacent to the specimens in the range of 60℉ to 80℉, and prevent loss of moisture. <u>Testing</u> Except when high-early strength concrete is specified, compressive strength testing will be performed at 28 days.

Arlington County, VA Materials Testing Specification Reference (September 2020)

MATERIAL AND TEST (***REF. - VDOT TEST METHODS MANUAL)***	**VDOT ROAD AND BRIDGE SPECIFICATION 2002** (***Or Latest Version)***	**MINIMUM RATE OF SAMPLING** (***REF. - VDOT MANUAL OF INSTRUCTIONS)***	**LOCATION OF SAMPLING**	**REMARKS**
ASPHALT PAVEMENT				
(a) In-Place Pavement Density by Nuclear Method (Roller Pattern)/ (Control Strip) (Asphalt Pavement)	Roads and Bridges Section 315.05 VTM-76 AASHTO T-166	Establish Roller pattern and Control Strip according to VTM-76. Ten (10) stratified random sample to establish target density. Verify minimum density achieved with cores per VTM-76. **QC technician shall be certified and pass State proficiency**	Field	Contractor/Asphalt Producer shall provide Certified Asphalt Paving Technician for density testing
(b) In-place Pavement Density by Nuclear Method and/or VDOT cores Test Section) (Asphalt Pavement)	Roads and Bridges Section 315.05 VTM-76 AASHTO T-166	Test Section- Lot Size: 5000 ft. per Lane width. Ten (10) stratified random samples per lot for nuclear gauge and/or five(5) stratified random plug/cores per lot **QC technician shall be certified and pass State proficiency**	Field	Contractor/Asphalt Producer shall provide Certified Asphalt Paving Technician for density testing
(c) Temperature Measurements	Roads and Bridges 211.08	One temperature measurement initially on first and fifth loads, each type mix each production day, and thereafter minimum of one per hour of production time for each mix type, by Producer's Certified Asphalt	QC - Processing or mixing plant from back of truck **QA – Field**	The Contractor should take and record temperature measurements of the asphalt concrete at the beginning of paving operations and thereafter at a rate of not less than one measurement every hour. The

Arlington County, VA Materials Testing Specification Reference (September 2020)

MATERIAL AND TEST (***REF. - VDOT TEST METHODS MANUAL)***	**VDOT ROAD AND BRIDGE SPECIFICATION 2002** (***Or Latest Version)***	**MINIMUM RATE OF SAMPLING** (***REF. - VDOT MANUAL OF INSTRUCTIONS)***	**LOCATION OF SAMPLING**	**REMARKS**
		Concrete Technician. If any test outside of tolerance, minimum of 3 additional tests made in different points of the load, and 4 tests averaged and average used as temperature of load or batch.		Project Officer may increase the frequency of temperature measurements at any time. The temperature should be checked using an appropriate heat-sensing device (i.e. probe thermometer, infrared thermometer, etc.).

Note 1. Density tests are reported on Forms TL-53, TL-54, TL-55, TL-124, TL-125 (Sand Cone Method), and TL-125A (One-Point Proctor Method).

Note 2. If there is a breakdown in the nuclear testing equipment, then density testing shall continue using other approved methods.

EXHIBIT J

COMMONWEALTH of VIRGINIA

DEPARTMENT OF TRANSPORTATION
4975 Alliance Drive
Fairfax, VA 22030

CHARLES A. KILPATRICK, P.E.
COMMISSIONER

September 29, 2016

MEMORANDUM

TO: NOVA District Staff

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

SUBJECT: Lane Closures in Nova District

As a follow up to the Lane Closures in Nova District memorandum dated April 27, 2012, enclosed are the updated guidelines for lane closures.

These updated guidelines will be effective immediately. All existing and previously approved projects are encouraged to review their respective contract documents and make adjustments if possible.

Lane Closure Guidelines

-For Northern Virginia-

Virginia Department of Transportation
Northern Region Operations

September 21, 2016

Instruction

The purpose of this memorandum is to present guidelines for lane closure hours for construction, maintenance, permits, and special events in Northern Virginia.

The first version of the lane closure guidelines was issued in April 2012. In the past four years, there have been completed and on-going roadway construction projects in the NoVA District, such as I-495 and I-95 express lanes and the I-66 spot improvements. As these guidelines are applied and implemented, modifications and updates to these guidelines have become necessary. Same as the previous version, the modifications were made based on traffic volume; roadway characteristics; comments from staff; and considering the public tolerance for the lane closure during certain time periods of the day.

It should be noted that these guidelines must be used as a starting point for discussion at the project level. On large scale projects with robust community outreach and a Traffic Management Plan, these hours could be extended. If project staff would like to modify these hours for interstate or major arterials, they must work with NRO Traffic Operations staff for recommendations and obtain final approval from their functional Assistant District Administrator (ADA).

Please review the existing contracts and discuss the deviations from these hours with your functional ADA.

Restriction of Operations:

In addition to the allowable lane closure hours specified in the tables, the restrictions listed below shall be followed.

1. **Peak Hours Lane Closures**
   Any lane reductions (temporary or permanent) during the peak periods (Monday to Friday, 6:00AM to 9:00AM and 3:30PM to 6:30PM) on roads with an AADT above or equal to 10,000 vehicles requires consultation with the Regional Operations Director (ROD) and Public Affairs Manager.

2. **Complete Roadway Closures**

   If there are complete road closures on any road for construction or maintenance work, the ROD and Public Affairs Manager must be consulted.

   Complete Roadway Closures shall be limited to 20 to 30 minutes intermittent stoppage for some specific work activities.

   If the closure duration is above 30 minutes, it shall be approved separately with full Maintenance of Traffic and Traffic Management Plans.

3. **Construction in Residential Subdivisions**

   Road work within residential subdivisions and/or cul-de-sac streets should be conducted during daytime hours to avoid night time noise issues.

4. **Express Lanes (I-95 & I-495)**

   All I-95 and I-495 Express Lane closures shall be coordinated with the Express Lanes Operations Center at least 5 business days in advance using their Authorization to Work form (available from the Express Lanes Operations Center at (571) 419-6046. Complete road closures on the I-95 Express Lanes and I-495 Express Lanes will be limited to 30 minutes or less

5. **Holiday**

   In addition to the Sunday or Holiday work limitations, mobile, short duration, short-term stationary or intermediate-term stationary temporary traffic control zone lane closures on mainline lanes, shoulders or ramps shall not be performed during the following Holiday time periods without the written permission of the Engineer. Additionally, long-term stationary temporary traffic control zones shall not be initially put in place, adjusted, or removed during the following Holiday time periods without the written permission of the Engineer (VDOT 2016 Standard Specifications, updated 7/2016):

- **January 1:** From Noon on the preceding day until Noon on the following day, except as indicated below.
- **Martin Luther King, Jr. Day and Lee Jackson Day*:** From Noon on the preceding Thursday to Noon on the following Tuesday.
- **Presidents Day*:** As indicated below.
- **Easter*:** As indicated below.
- **Memorial Day:** As indicated below.
- **July 4:** From Noon on the preceding day until Noon on the following day, except as indicated below.
- **Labor Day:** As indicated below.
- **Columbus Day*:** As indicated below.
- **Veterans Day*:** From Noon on the preceding day until Noon on the following day, except as indicated below.
- **Thanksgiving Day:** From Noon on the Wednesday proceeding Thanksgiving Day until Noon on the Monday following Thanksgiving Day.
- **Christmas Day:** From Noon on the preceding day until Noon on the following day, except as indicated below.

If the Holiday occurs on a Friday or Saturday: From Noon on the preceding Thursday to Noon on the following Monday.
If the Holiday occurs on a Sunday or Monday: From Noon on the preceding Friday to Noon on the following Tuesday.

***Note:**

For low volume roadways (minor arterial), lane closures will not be allowed during the holidays; however, there will be no restriction to the preceding day and the following day.

INTERSTATE 395 & INTERSTATE 95

WEEKDAY		Northbound			
		Single-Lane Closures or Shoulder	**Two-Lane Closures**	**Multiple-Lane Closures**	**Complete Road Closure**
Segment 1	**14th St. Bridge to Springfield Interchange**	10:00AM to 3:00PM 9:00PM to 5:00AM	10:00PM to 5:00AM	11:00PM to 5:00AM	12:00AM to 4:00AM
Segment 2	**Springfield Interchange to Rt.123**	9:30AM to 3:30PM 9:00PM to 5:00AM	10:00PM to 5:00AM	11:00PM to 5:00AM	12:00AM to 4:00AM
Segment 3	**Rt.123 to Prince William / Stafford County line**	9:30AM to 3:30PM 9:00PM to 5:00AM	10:00PM to 4:30AM	11:00PM to 4:00AM	12:00AM to 4:00AM
Segment 4	**Prince William / Stafford County line to Rt.3 Exit 130**	9:30AM to 3:30PM 9:00PM to 4:30AM	10:00PM to 4:30AM	n/a	12:00AM to 4:00AM
Segment 5	**Rt.3 Exit 130 to Caroline / Hanover County line**	9:00AM to 3:30PM 9:00PM to 5:30AM	10:00PM to 4:30AM	n/a	12:00AM to 4:00AM
All lanes open at 12:00 noon on Friday					
WEEKDAY		**Southbound**			
		Single-Lane Closures or Shoulder	**Two-Lane Closures**	**Multiple-Lane Closures**	**Complete Road Closure**
Segment 1	**14th St. Bridge to Springfield Interchange**	10:00AM to 2:30PM 9:30PM to 5:00AM	10:00PM to 5:00AM	11:00PM to 5:00AM	12:00AM to 4:00AM
Segment 2	**Springfield Interchange to Rt.123**	9:00AM to 2:00PM 9:30PM to 5:00AM	10:00PM to 5:00AM	11:00PM to 5:00AM	12:00AM to 4:00AM
Segment 3	**Rt.123 to Prince William / Stafford County line**	9:00AM to 2:00PM 9:30PM to 6:00AM	10:00PM to 5:00AM	11:00PM to 5:00AM	12:00AM to 4:00AM
Segment 4	**Prince William / Stafford County line to Rt.3 Exit 130**	9:00AM to 2:00PM 9:30PM to 6:00AM	10:00PM to 5:30AM	n/a	12:00AM to 4:00AM
Segment 5	**Rt.3 Exit 130 to Caroline / Hanover County line**	9:00AM to 3:00PM 9:30PM to 6:00AM	10:00PM to 5:30AM	n/a	12:00AM to 4:00AM
All lanes open at 11:00am on Friday					

INTERSTATE 395 & INTERSTATE 95			
WEEKEND	**Northbound/Southbound***		
	Single-Lane Closures or Shoulder	**Multiple-Lane Closures**	**Complete Road Closure**
Friday to Saturday	10:00PM to 7:00AM	11:00PM to 6:00AM	12:00AM to 5:00AM
Saturday to Sunday	10:00PM to 7:00AM	11:00PM to 6:00AM	12:00AM to 5:00AM
Sunday to Monday	10:00PM to 5:00AM	11:00PM to 4:00AM	12:00AM to 4:00AM
* For special operations, depending on time of year, additional hours may be allowed with proper ADA/ROD approval.			

	REVERSIBLE LANES (HOV & EXPRESS LANES)*	
	Single-Lane Closures or Shoulder	**Complete Road Closure****
WEEKDAY	9:30PM (Sunday to Thursday) to 4:00AM (Monday to Friday)	11:00PM to 4:00AM
WEEKEND	11:00PM (Friday to Saturday) to 9:00AM (Saturday to Sunday)	11:00PM to 4:00AM
* Direction of traffic control for all lane closures in reversible lanes will need to be adjusted as necessary to face direction of traffic.		
** Complete Road Closure on Express Lanes limited to 30 minutes or less.		

INTERSTATE 495 (BELTWAY)					
WEEKDAY		**Inner Loop**			
		Single-Lane Closures or Shoulder	**Two-Lane Closures**	**Multiple-Lane Closures**	**Complete Road Closure**
Segment 1	**A. L. Bridge to Springfield Interchange**	10:00AM to 3:00PM 9:30PM to 5:00AM	10:00PM to 5:00AM	11:00PM to 5:00AM	12:00AM to 5:00AM
Segment 2	**Springfield Interchange to W.W. Bridge**	10:00AM to 3:00PM 9:30PM to 5:00AM	10:00PM to 5:00AM	11:00PM to 5:00AM	12:00AM to 5:00AM
All lanes open at 12:00 noon on Friday					
WEEKDAY		**Outer Loop**			
		Single-Lane Closures or Shoulder	**Two-Lane Closures**	**Multiple-Lane Closures**	**Complete Road Closure**
Segment 1	**A. L. Bridge to Springfield Interchange**	9:30AM to 2:30PM 9:30PM to 5:00AM	10:00PM to 5:00AM	11:00PM to 5:00AM	12:00AM to 5:00AM
Segment 2	**Springfield Interchange to W.W. Bridge**	10:00AM to 3:00PM 9:30PM to 5:00AM	10:00PM to 5:00AM	11:00PM to 5:00AM	12:00AM to 5:00AM
All lanes open at 12:00 noon on Friday					
WEEKEND		**Inner/Outer Loop**			
		Single-Lane Closures or Shoulder		**Multiple-Lane Closures**	**Complete Road Closure**
Friday to Saturday		10:00PM to 8:00AM		11:00PM to 7:00AM	12:00AM to 5:00AM
Saturday to Sunday		10:00PM to 9:00AM		11:00PM to 8:00AM	12:00AM to 5:00AM
Sunday to Monday		9:30PM to 5:00AM		11:00PM to 5:00AM	12:00AM to 5:00AM

	EXPRESS LANES	
	Single-Lane Closures or Shoulder	**Complete Road Closure****
WEEKDAY	9:30PM (Sunday to Thursday) to 4:00AM (Monday to Friday)	11:00PM to 4:00AM
WEEKEND	11:00PM (Friday to Saturday) to 9:00AM (Saturday to Sunday)	11:00PM to 4:00AM
** Complete Road Closure on Express Lanes limited to 30 minutes or less.		

INTERSTATE 66					
WEEKDAY		**Eastbound**			
		Single-Lane Closures or Shoulder	**Two-Lane Closures**	**Multiple-Lane Closures**	**Complete Road Closure**
Segment 1	**Prince William County line to Route 286**	10:00AM to 3:30PM 8:00PM to 5:00AM	9:00PM to 5:00AM	10:00PM to 5:00AM	12:00AM to 4:00AM
Segment 2	**Route 286 to Beltway**	11:00AM to 3:30PM 9:00PM to 5:00AM	10:00PM to 5:00AM**	11:00PM to 5:00AM**	12:00AM to 4:00AM
Segment 3	**Beltway to TR Bridge (Inside Beltway)**	9:30PM to 5:00AM	n/a	n/a	12:00AM to 4:00AM
All lanes open at 12:00 noon on Friday					
WEEKDAY		**Westbound**			
		Single-Lane Closures or Shoulder	**Two-Lane Closures**	**Multiple-Lane Closures**	**Complete Road Closure**
Segment 1	**Prince William County line to Route 286**	9:00AM to 2:30PM 9:00PM to 6:00AM	9:30PM to 6:00AM	10:30PM to 5:00AM	12:00AM to 4:00AM
Segment 2	**Route 286 to Beltway**	9:00AM to 2:00PM* 9:30PM to 5:00AM	10:00PM to 5:00AM**	11:00PM to 5:00AM**	12:00AM to 4:00AM
Segment 3	**Beltway to TR Bridge (Inside Beltway)**	9:30AM to 2:00PM* 10:00PM to 5:00AM	10:00PM to 5:00AM**	n/a	12:00AM to 4:00AM
All lanes open at 12:00 noon on Friday					

**** Only be considered for three lane segment.***
*** Consider opening shoulder lane, where Applicable.*

WEEKEND	**Eastbound/Westbound**		
Outside Beltway	**Single-Lane Closures or Shoulder**	**Multiple-Lane Closures**	**Complete Road Closure**
Friday to Saturday	9:00PM to 9:00AM	10:00PM to 6:00AM	12:00AM to 5:00AM
Saturday to Sunday	9:00PM to 9:00AM	10:00PM to 6:00AM	12:00AM to 5:00AM
Sunday to Monday	8:00PM to 5:00AM	9:00PM to 5:00AM	12:00AM to 4:00AM
Inside Beltway	**Single-Lane Closures or Shoulder**	**Multiple-Lane Closures**	**Complete Road Closure**
Friday to Saturday	10:00PM to 6:00AM	n/a	12:00AM to 5:00AM
Saturday to Sunday	10:00PM to 6:00AM	n/a	12:00AM to 5:00AM
Sunday to Monday	9:30PM to 5:00AM	n/a	12:00AM to 4:00AM

ROUTE 267 CONNECTOR				
WEEKDAY	**Eastbound**		**Westbound**	
	Single-Lane Closures or Shoulder	**Complete Road Closure**	**Single-Lane Closures or Shoulder**	**Complete Road Closure**
Monday to Friday	11:00AM to 3:00PM	12:00AM to 4:00AM	9:30AM to 3:00PM	12:00AM to 4:00AM
	9:30PM to 5:00AM		9:00PM to 5:00AM	
All lanes open at 12:00 noon on Friday				

WEEKEND	**Eastbound/Westbound**	
	Single-Lane Closures or Shoulder	**Complete Road Closure**
Friday to Saturday	10:00PM to 8:00AM	12:00AM to 5:00AM
Saturday to Sunday	11:00PM to 8:00AM	12:00AM to 5:00AM
Sunday to Monday	9:00PM to 5:00AM	12:00AM to 4:00AM

Single-Lane Closures* or Shoulder					
ARTERIAL	**WEEKDAY**		**WEEKEND**		
	Monday to Thursday	Friday	Friday to Saturday	Saturday to Sunday	Sunday to Monday
Major Arterials**	9:30AM to 3:00PM 10:00PM to 5:00AM	9:30AM to 2:00 PM	10:00PM to 9:00AM	10:00PM to 8:00AM	10:00PM to 5:00AM
All Other Roadways	9:00AM to 3:30PM 9:00PM to 5:00AM	9:00AM to 2:00 PM	10:00PM to 9:00AM	9:00PM to 9:00AM	10:00PM to 5:00AM

Multiple-Lane Closures					
ARTERIAL	**WEEKDAY**		**WEEKEND**		
	Monday to Thursday	Friday	Friday to Saturday	Saturday to Sunday	Sunday to Monday
Major Arterials**	10:00PM to 5:00AM	Not allowed until 11:00PM	11:00PM to 5:00AM	11:00PM to 6:00AM	11:00PM to 5:00AM
All Other Roadways	9:00PM to 5:00AM	Not allowed until 10:00PM	10:00PM to 6:00AM	10:00PM to 6:00AM	10:00PM to 5:00AM

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

EXHIBIT K

State & Federal Roads in Arlington County, VA

State Routes

- Interstate 66: Custis Memorial Parkway
- Interstate 395: Henry G. Shirley Memorial Highway
- U.S. Route 1: Jefferson Davis Highway
- State Route 27: Washington Boulevard (Memorial Bridge to U.S. Route 50)
- U.S. Route 29: Lee Highway
- U.S. Route 50: Arlington Boulevard
- State Route 110: Jefferson Davis Highway (Rosslyn to Crystal City)
- State Route 120: Glebe Road
- State Route 123: Chain Bridge Road
- State Route 124: Spout Run Parkway (Lee Highway to Lorcom Lane)
- State Route 233: Airport Viaduct
- State Route 237: Washington Boulevard (North Glebe Road to Lee Highway)
- State Route 237: Fairfax Drive (Kirkwood Road to North Glebe Road)
- State Route 237: 10th Street North (U.S. Route 50 to Kirkwood Road)
- State Route 309: Old Dominion Drive

Federal Routes

- Arlington Hall Street
- Boundary Channel Drive
- George Washington Memorial Parkway
- Fort Myer streets, including Arlington National Cemetery
- Marshall Drive (North Meade Street to U.S. Route 110)
- Memorial Avenue
- Pentagon Street
- Spout Run Parkway (Lorcom Lane to George Washington Memorial Parkway)

EXHIBIT L

ARLINGTON COUNTY, VA
REQUEST FOR INFORMATION FORM

PROJECT: **RFI NUMBER:** _____
PROJECT NO.:

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

TO
☐ **(County Project Officer)** ☐ Action ☐ Faxed to _____ ☐ Emailed ☐ Mailed Pages ___
☐ **(Consultant)** ☐ Action ☐ Faxed to _____ ☐ Emailed ☐ Mailed Pages ___
☐ **(Other)** ☐ Action ☐ Faxed to _____ ☐ Emailed Pages ___

REGARDING: _____
SPEC. SECTION: _____ **DWG. NO.:** _____

EXPLANATION OF ISSUE: (Provide complete description of request with sketches or photos if necessary, and present status of work)

RECOMMENDATION / SUGGESTED SOLUTION:

RESPONSE PRIORITY: ☐ EARLIEST CONVENIENCE ☐ RUSH (WORK IN PROGRESS)
REASON FOR REQUEST: ☐ Existing Condition ☐ Non-conformance ☐ Clarification / Interpretation ☐ Agency Generated ☐ Other

CONTRACTOR : _____
BY: _____ **DATE**: _____ Dist: _____

ARCHITECT'S/ENGINEER'S ROUTING: (for A/E use only)
To: _____ Date: _____ Return to: _____ Date _____

TO: **(contractor)** _____ ☐ Faxed to _____ ☐ Emailed ☐ Mailed ☐ Hand delivered

RESPONSE:

☐ The above is considered a change. The following document will be used for processing: _____
☐ The above is consistent with the intent of and reasonably inferable from Contract Documents, or makes minor changes in the Work without change in Contract Sum or Contract Time. If Contractor does not agree, submit written notice within twenty (20) days substantiating claim in accordance with Contract Documents for approval.
☐ This RFI is returned without response for the following reason: ☐ Incomplete or lack of detailed information. ☐ Related to "means & methods". ☐ Lack of adequate Coordination Drawings. ☐ Is a "Substitution Request". ☐ Response required by others.

FROM: _____
BY: _____ **DATE:** _____ Dist: ☐ _____ ☐ File

Posted: 03/01/2018