

TUSCARORA CREEK STREAM RESTORATION AND FLOOD MITIGATION

**BIDDING DOCUMENTS
SUPPLEMENTAL SPECIFICATIONS**

**TOWN OF LEESBURG
25 WEST MARKET STREET
LEESBURG, VIRGINIA 20176**

DECEMBER 13, 2018

IFB NO. 06306-FY19-23

NOTICE OF ADDENDA: Any addenda to this BID will be posted on the Town's bid board and eVA and will only be emailed to those firms who have registered on the Bid Board. It is the firm's responsibility to provide a correct email address for the bid board, and to be aware of any addenda.

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**TOWN OF LEESBURG
ADVERTISEMENT FOR BID**

**TUSCARORA CREEK STREAM RESTORATION AND FLOOD MITIGATION
IFB NO. 06306-FY19-23**

SEALED BIDS to construct the above project WILL BE RECEIVED by the Office of Capital Projects for the Town of Leesburg, either by mail or hand delivered to the First Floor Lobby Receptionist, 25 West Market Street, Leesburg, VA 20176. Bids shall be marked “Sealed Bid for Tuscarora Creek Stream Restoration and Flood Mitigation Bid Date Tuesday, January 29, 2019 – 3:30 P.M.” Bids will be opened and read aloud at 25 West Market Street, Lower Level Conference Room 2, at that date and time.

All questions regarding this bid must be submitted in writing via email to CapitalBidQuestions@leesburgva.gov until but no later than 5:00 P.M. on Thursday, January 17, 2019.

The work included in this project includes stream restoration, constructed wetlands, wall construction, clearing, excavation, storm drainage, sanitary sewer, grading and miscellaneous site work, and all incidentals related thereto.

The Town reserves the right to perform all, part, or none of the work.

A non-mandatory pre-bid meeting will be held at 10:30 a.m. on Tuesday, January 8, 2019 at Leesburg Town Hall, 25 W. Market Street, Leesburg, Virginia.

Bid Documents are available for download from the Town’s Bid Board at <http://www.leesburgva.gov/bidboard> and may be obtained beginning Thursday, December 13, 2018. Contact Cindy Steyer at 703-737-2302 or csteyer@leesburgva.gov with questions about obtaining these bid documents. **Any addenda issued for this project will be posted on the Town’s Bid Board and eVA (<https://eva.virginia.gov>).**

Tom Brandon, Manager
Office of Capital Projects

TOWN OF LEESBURG, VIRGINIA

BID FORM

IFB NO. 06306-FY19-23

TUSCARORA CREEK STREAM RESTORATION AND FLOOD MITIGATION

SUBMIT A SIGNED BID FORM BY MAIL OR IN PERSON

FORMAL BIDS WILL BE DUE NO LATER THAN:

3:30 P.M. ON TUESDAY, January 29, 2019

The undersigned agrees to furnish all necessary labor, equipment, materials, and all things necessary to perform the work as set forth in accordance with the plans and specifications at the following prices:

SUBMITTED BY:

Vendor Name:	
Address:	
City/State/Zip:	
Authorized Signature:	
Print Name and Title:	
Telephone No.:	Fax No.:
State Corporation ID#:	
VA. Contractor License #:	
Tax ID Number (FIN/SSN):	
Vendor is a: (Insert name of state): _____	
<input type="checkbox"/> Corporation <input type="checkbox"/> Limited Partnership <input type="checkbox"/> Ltd. Liability Company <input type="checkbox"/> General Partnership <input type="checkbox"/> Unincorporated Assoc. <input type="checkbox"/> Sole Proprietorship	
E-mail:	Leesburg BPOL #:

ADDENDA

Bidder acknowledges receipt of the following ADDENDA, which have been considered in the preparation of this bid.

Addendum No. _____

Dated: _____

Addendum No. _____

Dated: _____

Addendum No. _____

Dated: _____

SCHEDULE OF PRICES

Ref.	DESCRIPTION	Units	Qty.	Unit Price	Extension
	Miscellaneous				
1	Mobilization / Demobilization	LS	1		\$
2	Construction Survey	LS	1		\$
3	Allaying dust using water truck	DAY	56		\$
4	Temporary 6' Chain Link Fence with CMU Base and Gate, Complete installation per plan details.	LS	1		\$
5	5'x4' Project Sign, complete as detailed in "Instructions to Bidders/Contract Items of Work".	EA	2		\$
6	As-Builts	LS	1		\$
	Sub-Total Miscellaneous				\$
	Clearing, Demolition, Erosion & Sediment Controls				
7	Clearing and Grubbing	AC	11		\$
8	Remove / Dispose of Pipe (Storm & Sanitary)	LF	700		\$
9	Remove / Dispose of Structure (Storm & Sanitary)	EA	5		\$
10	Remove / Dispose of Concrete Curb	LF	40		\$
11	Demo & Dispose of Pavement (Flexible) Variable Thickness	SY	700		\$
12	Relocate Light Pole, Complete per requirements	EA	1		\$
13	Determine if Structure is Monitoring Well and Properly Abandon Steel Casing per plan requirements	LS	1		\$
14	Tree Protection Complete in Place Incl. Maintenance & Removal	LF	1,235		\$
15	Super Silt Fence, Complete in Place Incl. Maintenance & Removal	LF	980		\$

Ref.	DESCRIPTION	Units	Qty.	Unit Price	Extension
16	Safety Fence Complete in Place Incl. Maintenance & Removal	LF	5,100		\$
17	Inlet Protection Complete in Place Incl. Maintenance & Removal	EA	7		\$
18	VDOT EC-1, CL I or CL II, Complete in Place	SY	385		\$
19	Outlet Protection Complete in Place Incl. Maintenance & Removal	EA	3		\$
20	Construction Entrance Including Wash Rack1, Complete in Place Incl. Maintenance & Removal	EA	2		\$
21	Temp. Access Road, Complete incl. Removal and Restoration	SY	4,200		\$
22	Temp. Vehicle Watercourse Crossing, Complete incl. Removal and Restoration	EA	3		\$
23	Trench Dewatering	LF	2,000		\$
24	Pump Around, Including sandbags and sump pump	MONTH	10		\$
25	Air tool investigation / Root Pruning complete as required (Performed by certified arborist)	LF	1,150		\$
26	Temp. Seeding & Mulching	SY	14,000		\$
	Sub-Total Clearing, Erosion & Sediment Controls				\$
	Stream Restoration				
27	Rock Cross Vane, Complete per plans and specifications incl. Geotextile Fabric	LF	1,700		\$
28	Rock Vane, Complete per plans and specifications incl. Geotextile Fabric	LF	220		\$
29	Rock Toe Revetment, Complete per plans and specifications incl. Geotextile Fabric	CY	800		\$
30	Cobble-Gravel Streambed, Complete per plans and specifications	SY	12,000		\$
31	Slit Trench Excavation/Backfill, Complete per plans and specifications	LF	1,775		\$
32	Riffle Structures, Complete per plans and specifications	LF	610		\$

Ref.	DESCRIPTION	Units	Qty.	Unit Price	Extension
33	Armored Glide, Complete incl. installation as per plans and specifications incl. Geotextile Fabric	SY	150		\$
	Sub-Total Stream Restoration				\$
	Landscape				
34	Zone 1A - Inner Berm Planting, Complete per plans and specifications per plan	SY	1,100		\$
35	Zone 1 - Stream Banks Planting, Complete per plans and specifications	SY	5,150		\$
36	Zone 2 - Floodplain, Complete per plans and specifications	SY	33,650		\$
37	Zone 2A - Floodplain (seed mix only), Complete per plans and specifications	SY	4,950		\$
38	Zone 3 - Depressional Wetland, Complete per plans and specifications	SY	1,300		\$
39	Zone 4 - Fescue Grass Seed, Complete per plans and specifications	SY	12,650		\$
40	Coir Fiber Matting (Biodegradable), Complete per plans and specifications	SY	33,000		\$
	Sub-Total Landscape				\$
	Storm Sewer				
41	24" RCP CL III Pipe, Complete in place including Excavation, Bedding & Backfill	LF	111		\$
42	36" RCP CL III Pipe, Complete in place including Excavation, Bedding & Backfill	LF	89		\$
43	42" RCP CL IV Pipe, Complete in place including Excavation, Bedding & Backfill	LF	169		\$
44	48" RCP CL IV Pipe, Complete in place including Excavation, Bedding & Backfill	LF	875		\$
45	54" RCP CL III Pipe, Complete in place including Excavation, Bedding & Backfill	LF	14		\$
46	60"X38" RCP CL III, Complete in place including Excavation, Bedding & Backfill	LF	229		\$
47	DI-4B (L=8'), Complete in place including excavation & backfill	EA	1		\$
48	DI-12 (L=8'), Complete in place including excavation & backfill	EA	4		\$
49	42" ES-1, Complete in place including excavation, bedding & backfill	EA	1		\$

Ref.	DESCRIPTION	Units	Qty.	Unit Price	Extension
50	54" ES-1, Complete in place including excavation, bedding & backfill	EA	1		\$
51	60" dia. MH 1, Complete in place including excavation, bedding & backfill	VF	27		\$
52	72" dia. MH 1, Complete in place including excavation, bedding & backfill	VF	21		\$
53	84" dia. MH 1, Complete in place including excavation, bedding & backfill	VF	7		\$
54	MH Frame & Cover, Complete in place	EA	13		\$
55	Tie-in to Structure 154, Complete in place including excavation, bedding & backfill	EA	1		\$
56	36" EW-1, Complete in place including excavation, bedding & backfill	EA	1		\$
57	Junction Box, Complete in place per Plans and Specifications, including excavation, bedding & backfill	EA	5		\$
58	Armorflex Articulated Matting, Complete in Place per Plans and Specifications	SY	455		\$
59	Handrail HR-1 Type II, Complete in Place per Plans and Specifications	LF	72		\$
	Sub-Total Storm Sewer				\$
	Sanitary Sewer				
60	12" PVC Sanitary Sewer Pipe, Complete installation including excavation, bedding, Polyethylene Encasement and backfill	LF	15		\$
61	12" DI Sanitary Sewer Pipe, Complete installation including excavation, bedding Polyethylene Encasement and backfill	LF	300		\$
62	Sanitary Sewer Standard Concrete Encasement, Complete in Place	LF	80		\$
63	Sanitary Sewer Manhole, Complete in place including excavation, bedding & backfill	EA	2		\$
64	Sanitary Sewer Doghouse, Complete in place including excavation, bedding & backfill	EA	1		\$
65	Sanitary Sewer Manhole Watertight Frame and Cover, Complete in Place	EA	3		\$

Ref.	DESCRIPTION	Units	Qty.	Unit Price	Extension
66	Internal Drop Connection to Manhole	EA	1		\$
67	Adjust Existing Sanitary MH, Complete installation including excavation and backfill.	LS	1		\$
68	Concrete Pier, Complete in place per Plans and Specifications, including excavation, and backfill	EA	1		\$
	Sub-Total Sanitary Sewer				\$
	Pavement				
69	Aggregate Base, VDOT 21-A, Complete in Place incl. fine grading	TN	250		\$
70	Base Asphalt Mix, BM-25.0A	TN	130		\$
71	Surface Asphalt Mix, SM-9.5D	TN	70		\$
72	TS-20 Standard Concrete Driveway Entrance with Curb & Gutter, Complete in place including excavation & backfill	EA	2		\$
73	Curb - CG2, Complete in place incl. excavation, stone under curb & backfill	LF	110		\$
	Sub-Total Pavement				\$
	Pavement Marking / Signs				
74	Single Solid 4" White line Type B CL I	LF	435		\$
75	Install New Wheel Stops, Complete in place per plans and specifications	EA	25		\$
76	Sign, Complete incl. Post (per DCSM TS-5)	EA	1		\$
77	Traffic Barricade Type III	LF	60		\$
	Sub-Total Pavement Marking / Signs				\$

Ref.	DESCRIPTION	Units	Qty.	Unit Price	Extension
	<i>Flood Wall / Retaining Wall</i>				
78	Flood Wall with Facade, complete per plan details and specifications Including Excavation & Backfill	SF	5,000		\$
79	Retaining Wall with Facade, complete per plan details and specifications Including Excavation & Backfill	SF	1,200		\$
80	MOD Hand Rail HR-1, Complete per plans and specifications	LF	105		\$
	<i>Sub-Total Flood Wall / Retaining Wall</i>				\$
	<i>Earthwork</i>				
81	Regular Excavation (including topsoil respreading)	CY	11,000		\$
82	Unclassified Excavation to haul off-site (including but not limited to Asphalt & Concrete)	CY	19,000		\$
83	Clay Plug, Complete per plans and specifications	CY	450		\$
84	Borrow Excavation (Clay Fill)	CY	2,200		\$
	<i>Sub-Total Earthwork</i>				\$
	TOTAL				\$

Notes:

1) Sidewalk and curb and gutter protection is incidental to the cost of the temporary construction entrance.

ESCROW OF RETAINED FUNDS

In accordance with Section 2.2-4334 of the Virginia Public Procurement Act (VPPA), any Contract valued at \$200,000 or more for construction of highways, roads, streets, bridges, parking lots, demolition, clearing, grading, excavating, paving, pile driving miscellaneous drainage structures, and the installation of water, gas, sewer lines and pumping stations where portions of the Contract price are to be retained, at the time of submitting a bid, the CONTRACTOR shall have the option to indicate preference for using the escrow account procedure for utilization of the Town retained funds by so indicating in the space provided in the proposal documents. In the event the successful Contract elects to use the escrow account procedure, the "Escrow Agreement" included in the Contract documents shall be executed and submitted to the Manager, Office of Capital Projects within 15 days after receipt of the Notice to Award. If the "Escrow Agreement" form is not submitted, the CONTRACTOR shall forfeit his rights to the use of the escrow account procedure within the 15-day period.

In order to have retained funds paid to an escrow agent, the CONTRACTOR, the escrow agent, and the surety shall execute the "Escrow Agreement" furnished by the TOWN, and submit same to the Office of Capital Projects for approval. The CONTRACTOR's escrow agent shall be a trust company, approved bank or savings and loan institution with its principal office located in the Commonwealth of Virginia. The "Escrow Agreement" shall contain the complete address of the escrow agent and surety, and the executed "Escrow Agreement" will be authority for the TOWN to make payment of retained funds to the escrow agent. After approving the agreement, the TOWN will pay to the escrow agent the funds retained as provided herein, except that funds retained for lack of progress or other deficiencies on the part of the CONTRACTOR will not be paid to the escrow agent. The escrow agent may, in accordance with the stipulations contained in the "Escrow Agreement", invest the funds paid into the escrow account and pay earnings on such investments to the CONTRACTOR, or release the funds to the CONTRACTOR, provided such funds are fully secured by approved securities.

Retained funds invested, and securities held as collateral for retainage may be released only as and when directed by the Manager, Office of Capital Projects. When the final estimate is released for payment, the Manager, Office of Capital Projects will direct the escrow agent to settle the escrow amount by paying the CONTRACTOR or the TOWN monies due them as determined by the Manager, Office of Capital Projects. The TOWN reserves the right to recall retained funds and to release same to the surety upon receipt of written request from the CONTRACTOR or in the event of default.

- We elect to use the escrow account procedure for the deposit of retained funds.

- We elect not to use the escrow account procedure for the deposit of retained funds.

END OF SECTION

BID BOND

BOND NO. _____

AMOUNT: \$ _____

KNOW ALL MEN BY THESE MEN PRESENTS, that _____ hereinafter called the PRINCIPAL, and _____ a corporation duly organized under the laws of the State of _____ having its principal place of business at _____ in the State of _____ and authorized to do business in the Commonwealth of Virginia, as SURETY, are held and firmly bound unto _____, as OWNER, hereinafter called the OBLIGEE, in the sum of _____ DOLLARS (\$ _____) for the payment for which we bind ourselves, our heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS BOND IS SUCH THAT:

WHEREAS, the PRINCIPAL is herewith submitting his or its Bid Proposal for _____ said Bid Proposal, by reference thereto, being hereby made a part hereof.

NOW THEREFORE,

- (A) If the bid shall remain open for a period of not less than 60 days following opening of the bids and be rejected, or in the alternate,
- (B) If the bid shall remain open for a period of not less than 60 days following opening of the bids and be accepted and the PRINCIPAL shall execute and deliver a Contract in the form of Contract attached hereto (properly completed in accordance with the bid) and shall furnish a performance and payment deposit or surety bond for his faithful performance of the Contract, and for the payment of all persons performing labor or furnishing materials in connection therewith,
- (C) THEN, this obligation shall be void; otherwise the same shall remain in force and effect, it being expressly understood and agreed that the liability of the SURETY for any and all claims hereunder shall, in no event, exceed the said amount of this obligation as herein stated. Provided, however, that in addition to the amount of this obligation as herein stated, the SURETY shall be liable for all costs and attorney's fees incurred by the OBLIGEE in enforcing the obligations hereunder.

The SURETY, for value received, hereby stipulates and agrees that the obligation of the SURETY and its bond shall be in no way impaired or affected by any extension of the time

within which the OWNER may accept such bid; and the SURETY does hereby waive notice of such extension.

IN WITNESS WHEREOF, the PRINCIPAL and the SURETY have hereunto set their hands and seals, and have executed this instrument and such of them as are corporations have caused their corporate seals to be hereto affixed and these presents to be signed by their proper officers, the day and year first set forth above.

Signed and sealed this _____ day of _____, 20_____ .

PRINCIPAL

By _____

SURETY

By _____

Attorney-In-Fact

IMPORTANT: The SURETY executing bonds must appear on the Treasury Department's most current list (Circular 570 as amended) and be authorized to transact business in the Commonwealth of Virginia.

END OF SECTION

SAMPLE AGREEMENT

THIS AGREEMENT, dated this ____ day of _____, 20__ is between the Town of Leesburg (hereinafter called TOWN or Owner) and _____ (hereinafter called CONTRACTOR). TOWN AND CONTRACTOR, in consideration of the mutual covenants hereinafter set forth, agree as follows:

1. **WORK**

1.1 The project's name is _____, project # _____.

1.2 CONTRACTOR shall complete all Work as specified or indicated in the Contract Documents. The Work is generally described as follows:

The project includes _____
_____.

2. **OWNER'S REPRESENTATIVES**

2.1 All references to the Owner's Chief Procurement Officer shall mean: _____.

2.2 All references to the Owner's Project Manager or ENGINEER shall mean: _____, who shall have the sole responsibility for clarifying any ambiguities.

3. **CONTRACT TIME AND LIQUIDATED DAMAGES**

3.1 Time of the Essence

A. All time limits for Interim Completion, Milestones, Substantial Completion, and Final Completion as stated in the Contract Documents are of the essence of the Contract.

B. Contract Time:

a. The Work to be performed under this Contract shall be commenced after issuance of the Notice to Proceed and Substantial Completion shall be achieved within _____ calendar days.

b. Final Completion shall be achieved within ____ calendar days.

c. [Insert Interim or Milestone dates as appropriate.]

3.2 Liquidated Damages

A. TOWN and CONTRACTOR recognize that time is of the essence of this Agreement and the TOWN will suffer financial loss if the Work is not completed within the time specified in paragraph 3.1 above, plus any extensions thereof allowed in accordance with the General Conditions, Article 8, "TIME." Contractor recognizes the delays, expense, and difficulties involved in proving in a legal or other dispute resolution proceeding the actual loss suffered by TOWN if the Work is not completed on time. Accordingly, instead of requiring any such proof, TOWN and CONTRACTOR agree that as liquidated damages for delay, but not as a penalty, CONTRACTOR shall pay the TOWN as follows:

a. For each day that expires after the time established to achieve Substantial Completion as specified above, CONTRACTOR shall pay TOWN liquidated damages in the amount of \$_____.

- b. For each day that expires after the time established to achieve Final Completion as specified above, CONTRACTOR shall pay TOWN liquidated damages in the amount of \$_____.
 - c. [Insert liquidated damage rate for and Interim or Milestone dates.]
- B. CONTRACTOR hereby waives any defense as to the validity of any liquidated damages stated in this Agreement as they may appear on the ground that such liquidated damages are void as penalties or are not reasonably related to actual damages.
- C. TOWN may recover liquidated damages by deducting the amount owed from progress payments, final payment or retainage.

4. **CONTRACT PRICE**

4.1. *[If Fixed Price]* In consideration of the Performance of the Contract, the Owner agrees to pay the Contractor as compensation for his services the firm, fixed price of: _____ Dollars and _____ Cents (\$_____).

4.2. *[If Unit Price]* In consideration of the Performance of the Contract, the Owner agrees to pay the Contractor as compensation for his services in accordance with the Bid Form and Contract Documents, which are included as Exhibits to this Agreement, an amount equal to the sum of the itemized prices as shown for each item of work multiplied by the actual quantity of each item completed:

A. Total Computed Price used for Comparison and Award:

_____ (Words)
 \$_____ (Figures)

All specific cash allowances are included in the above price and have been computed to include the Contractors profit, overhead, all furnishing and installation charges.

This is a unit price contract and the estimated quantities are not guaranteed and are given only as a basis of calculation for comparing and awarding the project. The determinations of actual quantities and classifications are to be made by Project Manager, as provided in the General Conditions, Article 9. The Total Computed Price used for Comparison and Award will be deemed to include for all Unit Price Work an amount equal to the sum of the unit price for each separately defined item times the estimated quantity for each item as indicated on the bid form. Notwithstanding the language of this paragraph, the contract price shall not exceed \$_____ without further authorization.

5. **INTEREST**

- 5.1 The TOWN will pay on all amounts owed to the CONTRACTOR accordance with Section 2.2-4355 of the Virginia Public Procurement Act.
- 5.2 The rate of interest charged shall be the base rate on corporate loans (prime rate) at large United States money center commercial banks as reported daily in the publication entitled The Wall Street Journal. Whenever a split prime rate is published, the lower of the two rates shall be used.

6. **CONTRACT DOCUMENTS**

6.1 The Contract Documents which comprise the entire Agreement between TOWN and CONTRACTOR concerning the Work are defined as follows:

- A. This Agreement (pages 1 to _____, attached);
- B. Performance Bond (pages 1 to 2, attached);
- C. Payment Bond (pages 1 to 2, attached);
- D. Insurance Certificate (pages 1 to 2, attached);
- E. Bidding Documents (by reference) including:
 - 1. Advertisement for Bids;
 - 2. Instructions to Bidders;
 - 3. General Conditions;
 - 4. Specifications;
 - 5. Supplemental Specifications;
 - 6. Construction Drawings prepared by _____ bearing the following title:
_____(Sheets ___ through ___) approved _____
- 7. Addenda
- F. CONTRACTOR'S Bid (attached);
- G. Deliverables issued on or after the effective date of the Agreement and are not attached hereto:
 - 1. Notice to Proceed
 - 2. Written Amendments
 - 3. Work Change Directives
 - 4. Change Orders

7. **Notice**

The term "Notice" as used herein shall mean and include written notice. Any legal notice by any party shall be deemed to have been duly given if either delivered personally or enclosed in a registered, postage paid envelope addressed to:

The Owner:

The Owner's Project Manager:

The Contractor:

IN WITNESS WHEREOF, TOWN and CONTRACTOR have signed two copies of this Agreement. All portions of the Contract Documents have been signed or identified by TOWN and CONTRACTOR.

OWNER
TOWN OF LEESBURG
25 West Market Street
Leesburg, VA 20176

CONTRACTOR

By _____
Town Manager

By _____
President

Date _____

Date _____

License No: _____

[CORPORATE SEAL]

Approved as to Form:

Town Attorney

Resolution authorizing execution of Agreement is attached hereto.

Agent for service of process:

(If CONTRACTOR is a corporation attach evidence of authority to sign.)

VIRGINIA PAYMENT BOND

BOND NO. _____

AMOUNT: \$ _____

KNOW ALL MEN BY THESE PRESENTS, that _____
of _____ hereinafter called the CONTRACTOR
(Principal), and _____
a corporation duly organized and existing under and by virtue of the laws of the State
of _____, hereinafter called the SURETY, and authorized to
transact business _____ within the
Commonwealth of Virginia, as SURETY, are held and firmly bound unto The Town of Leesburg
as OWNER (Obligee), in the sum of:

_____ DOLLARS (\$ _____), lawful money
of the United States of America, for the payment of which, well and truly be made to the
OWNER. The CONTRACTOR and the SURETY bind themselves and each of their heirs,
executors, administrators, successors, and assigns, jointly and severally, firmly by these presents
as follows:

THE CONDITION OF THE ABOVE OBLIGATION IS SUCH THAT:

WHEREAS, the CONTRACTOR has executed and entered into a certain Contract hereto
attached with _____, naming the OWNER as beneficiary, dated this
_____ day of _____, 20 _____,
for: _____

NOW, THEREFORE, the CONTRACTOR shall promptly make payment to all persons, firms,
subcontractors, and corporations furnishing materials for or performing labor in the prosecution
of the work provided for in the Contract, and any authorized extension or modification thereof,
including all amounts due for materials, lubricants, oil, gasoline, coal and coke, repairs on
machinery, equipment, and tools consumed or used in connection with the construction of the
work, and all insurance premiums on the work, and for all labor performed in the work, whether
by subcontractor or otherwise, then this obligation shall be void; otherwise to remain in full force
and effect.

Furthermore, the SURETY, for value received, hereby stipulates and agrees that no change,
extension of time, alteration, or addition to the terms of the Contract Documents or to the work to
be performed there under, or the Specifications accompanying the same, shall in any way affect

its obligation on this bond, and it does hereby waive notice of any such change, extension of time, alteration, or addition to the terms of the Contract Documents.

PROVIDED, FURTHER that no final settlement between the OWNER and the CONTRACTOR shall abridge the right of any beneficiary hereunder, whose claim may be unsatisfied.

IN WITNESS WHEREOF, the above parties bounded together have executed this instrument this _____ day of _____, 20____, the name and corporate seal of each corporate party being hereto affixed and those presents duly signed by its undersigned representative, pursuant to authority of its governing body.

CONTRACTOR

By _____(Seal)

Attest

SURETY

By _____(Seal)

Attest

NOTE: Date of bond must not be prior to date of Contract. If CONTRACTOR is a partnership, all partners should execute bond.

IMPORTANT: The SURETY named on this bond shall be one who is licensed to conduct business in the Commonwealth of Virginia, and named in the current list of Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies, as published in Circular 570 (amended) by the Audit Staff Bureau of Accounts, U.S. Treasury Department. All bonds signed by an agent must be accompanied by a certified copy of the authority to act for the SURETY at the time of the signing of this bond.

VIRGINIA PERFORMANCE BOND

BOND NO. _____

AMOUNT: \$_____

KNOW ALL MEN BY THESE PRESENTS, that _____

of _____

hereinafter called the CONTRACTOR (Principal), and _____

_____ a corporation duly organized and existing under and by virtue of the laws of the State of _____, hereinafter called the SURETY, and authorized to transact business _____ within the Commonwealth of Virginia, as SURETY, are held and firmly bound unto The Town of Leesburg as OWNER (Obligee), in the sum of:

_____ DOLLARS (\$ _____), lawful money of the United States of America, for the payment of which, well and truly be made to the OWNER. The CONTRACTOR and the SURETY bind themselves and each of their heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these presents as follows:

THE CONDITION OF THE ABOVE OBLIGATION IS SUCH THAT:

WHEREAS, the CONTRACTOR has executed and entered into a certain Contract hereto attached with _____, naming the OWNER as beneficiary, dated this _____ day of

_____, 20 _____,

for: _____

NOW, THEREFORE, the CONTRACTOR shall at all times duly, promptly, and faithfully perform the Contract and any alteration in or addition to the obligations of the CONTRACTOR arising there under, including the matter of infringement, if any, of patents or other proprietary rights, and shall assure all guarantees against defective workmanship and materials, including the guarantee period following final completion by the CONTRACTOR and final acceptance by the OWNER and comply with all covenants therein contained in the Specifications, Drawings, and other Documents constituting a part of the Contract required to be performed by the CONTRACTOR, in the manner and within the times provided in the Contract, and shall fully indemnify and save harmless the OWNER from all cost and damage which it may suffer by reason or failure so to do, and shall fully reimburse and repay it all outlay and expenses which it

may incur in making good any default, and reasonable counsel fees incurred in the prosecution of or defense of any action arising out of or in connection with any such default, then this obligation shall be void; otherwise to remain in full force and effect.

Furthermore, the SURETY, for value received, hereby stipulates and agrees that no change, extension of time, alteration, or addition to the terms of the Contract Documents or to the work to be performed there under, shall in any way affect its obligation on this bond, and it does hereby waive notice of any such change, extension of time, alteration, or addition to the terms of the Contract Documents.

PROVIDED, FURTHER that no final settlement between the OWNER and the CONTRACTOR shall abridge the right of any beneficiary hereunder, whose claim may be unsatisfied.

IN WITNESS WHEREOF, the above parties bounded together have executed this instrument this _____ day of _____, 20____, the name and corporate seal of each corporate party being hereto affixed and those presents duly signed by its undersigned representative, pursuant to authority of its governing body.

CONTRACTOR

Attest

By _____(Seal)

SURETY

Attest

By _____(Seal)

NOTE: Date of bond must not be prior to date of Contract. If CONTRACTOR is a partnership, all partners should execute bond.

IMPORTANT: The SURETY named on this bond shall be one who is licensed to conduct business in the Commonwealth of Virginia, and named in the current list of Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies, as published in Circular 570 (amended) by the Audit Staff Bureau of Accounts, U.S. Treasury Department. All bonds signed by an agent must be accompanied by a certified copy of the authority to act for the SURETY at the time of the signing of this bond.

INSTRUCTIONS TO BIDDERS

1. NON-MANDATORY PRE-BID MEETING

Prospective bidders are invited to attend a meeting to discuss the proposed work under this Contract. The meeting will be held at 10:30 a.m. on Tuesday, January 8, 2019, at 25 West Market Street, Leesburg, Virginia.

Representatives of the Town will be available to answer questions relative to the work. Any pertinent data or change resulting from the Pre-Bid Meeting will be included in an addendum issued after the meeting; however, the importance of attending the meeting is stressed. Any questions or conflict identified prior to bid should be submitted in writing in accordance with the "Comments Concerning Specifications" paragraph below.

2. STREAM RESTORATION SPECIALIST

Description: Provide a qualified individual in stream restoration work as part of the Contract and will be considered incidental to the cost of the project.

Requirements: Due to the nature of the work involved and the environmentally-sensitive location of this project, the Contractor shall provide a specially qualified individual in stream restoration as part of the Contract requirements.

The Contractor shall assign an individual who possesses special knowledge, background, training, and experience in stream restoration construction in general, including but not limited to:

- (a) The maintenance of stream flow, including clean water pumps, dirty water pumps, and other related sediment and erosion control practices;
- (b) The construction of scour protection pools, scour protection aprons, habitat roughness logs, grade control log structures, clay channel blocks, channel bed materials, Class I channel protection and depressional wetland areas;
- (c) The planting of riparian buffers and floodplains; and stream restoration construction stakeout, access to construction zones, clearing, erosion and sediment control installation, and earth disturbance activities in and adjacent to stream projects without disturbing adjacent or nearby natural resources such as wetlands, trees, etc.

The Stream Restoration Specialist also shall have knowledge, background, training, and experience in the following areas.

- (a) The regulatory notifications, inspections, and reports that shall be the responsibility of the Contractor;
- (b) The Contractor's responsibility regarding control of subcontractors and suppliers;
- (c) The elements of the National Pollutant Discharge Elimination System (NPDES) triggers; and
- (d) The maintenance of project sequence of construction and limits of disturbance.

Within 14 calendar days from receiving notice of being the apparent low bidder, the Contractor shall submit sufficient documentation of the knowledge, background, training, and experience of the Contractor's designated Stream Restoration Specialist to the Town. The Town will review and approve the Contractor's assignment. No Notice of Award will be issued until the Town has formally approved the Contractor's assignment of the designated stream restoration specialist. Failure on the part of the Contractor to submit the documentation and information specified herein

may become a basis for the Town to deem the Contractor as non-responsible.

The Stream Restoration Specialist shall have full authority to manage the construction of all stream-related work elements contained in the Contract Documents. The Stream Restoration Specialist shall be present onsite at all times when either stream restoration work is being performed, or when the Contractor or any of the Contractor's subcontractors is performing work that may affect or impact in anyway the stream being restored.

The Contractor may replace the assigned Stream Restoration Specialist, only by requesting such replacement in writing and submitting, to the Town, sufficient documentation of the knowledge, background, training, and experience of the designated replacement stream restoration specialist. The Town will review the Contractor's request. Before formally assigning the replacement Stream Restoration Specialist, the Contractor shall obtain the written approval for the replacement from the Town. No individual may perform any stream restoration work or other work of any kind that may affect or impact in anyway the stream being restored until an approved Stream Restoration Specialist is onsite.

The Contractor shall be aware and shall understand that the failure of the Contractor to accord and support the authority of the Stream Restoration Specialist, as provided hereinabove, shall be a basis for the Town, in the exercise of its sole discretion, to shut down the Contract until the Contractor complies with this requirement.

The Contractor also shall be aware and shall understand that the failure of the Stream Restoration Specialist to comply with any applicable regulatory requirement, to implement any element of the Contract Documents, or to assure compliance by any workman onsite with such requirements or elements, shall be a basis for the Town, also in the exercise of its sole discretion, to remove the Stream Restoration Specialist from the Contract. The project will remain shut down until the Contractor replaces the Stream Restoration Specialist with an individual of equal qualifications, as set forth in this Special Provision, and the Contractor' designation of the replacement Stream Restoration Specialist has been approved by the Town.

3. COMMENTS CONCERNING SPECIFICATIONS (VPPA 2.2-4316)

General and Technical questions relating to this solicitation shall be submitted in writing to the Office of Capital Projects by email at CapitalBidQuestions@leesburgva.gov. Please put the title of this IFB in the subject line of the email.

If any questions or responses require revisions to the solicitation as originally published, such revisions will be by formal addendum only. Bidders are cautioned that any written or oral representations made by any Town representative or other person that appear to change materially any portion of the solicitation shall not be relied upon unless subsequently ratified by a written addendum to this solicitation issued by the Office of Capital Projects. For determination as to whether an oral or written representation of any Town representative or other person requires that an addendum be issued, contact the Manager, Office of Capital Projects in writing by e-mail at CapitalBidQuestions@leesburgva.gov.

4. EXAMINATION OF DOCUMENTS

Bidders should thoroughly familiarize themselves with the terms and conditions of this IFB. Bidders will not be relieved from assuming all responsibility for properly estimating the difficulties, quantities and the cost of performing the Work required herein due to their failure to become

acquainted with all Bid Documents, schedules and liability concerning the Work to be performed.

5. BIDDER SITE INVESTIGATION – CONSTRUCTION

Bidders should take steps reasonably necessary to ascertain the nature and location of the Work, and the general and local conditions which can affect the Work or its cost, including but not limited to (1) conditions bearing upon transportation, disposal, handling, and storage of materials; (2) the availability of labor, water, electric power, and roads; (3) uncertainties of weather, stream stages, or similar physical conditions at the site; (4) the conformation and conditions of the ground; (5) the character of equipment and facilities needed preliminary to and during the performance of the Work; (6) all conditions related to site access, required permits, utilities coordination, and local jurisdictions' requirements; and (7) the character, quality, and quantity of surface and subsurface materials or obstacles to be encountered insofar as this information is reasonably ascertainable from an inspection of the site, including all exploratory work done by the Town, as well as from the Drawings and Specifications made a part of the Contract.

The Contractor is solely responsible for any conclusions or interpretations made by the Contractor based on the information made available by the Town. The Town assumes no responsibility for, and Contractor is solely responsible for, any understanding based upon any representation made by any Town officers or agents before the execution of the Contract, unless that understanding or representation is expressly stated in the Contract.

Bidders are on notice that the Bidder awarded the Contract will be responsible for estimating properly the difficulty and cost of successfully performing the Work, and successfully performing the Work, without additional expense to the Town or extension of time.

6. INCOMPLETE DOCUMENTS

The Contractor, as a bidder, is responsible for having determined the accuracy and completeness of bid documents upon which it relied in making its bid, and having notified the Manager, Office of Capital Projects immediately upon discovery of an apparent inaccuracy, error in, or omission of any pages, drawings, sections, or addenda whose omission from the documents was apparent from a reference or page numbering in the bidding documents.

If the Contractor proceeds with any activity that may be affected by an inaccuracy, error in, or omission described above, of which it has not notified the Manager, Office of Capital Projects, the Contractor hereby agrees to perform any work described in such missing or incomplete documents at no additional cost to the Town.

7. TOWN OF LEESBURG BUSINESS PROFESSIONAL AND OCCUPATION LICENSE (BPOL)

The successful bidder must comply with the provisions of Section 20, Article IX (Business Professional and Occupational License Tax) of the Town of Leesburg Code, if applicable. Contractors are not required to be licensed to submit a bid; however, the successful bidder must obtain a license before the commencement of work. For information on the provisions of this chapter and its applicability to this Contract, contact the Town of Leesburg Staff Accountant, Finance Department, Town of Leesburg, Virginia by telephone at 703-771-6503.

8. FORM AND STYLE OF BIDS

The Bids shall be submitted on forms identical to the Bid Form included with the Bidding Documents, and all blanks on the Bid Form shall be filled in by a typewriter or manually in ink. Where so indicated by the makeup of the Bid Form, sums shall be expressed in both words and figures, and in case of discrepancy between the two, the amount written in words shall govern. Any interlineations, alterations, and erasures must be initialed by the signer of the Bid.

Each copy of the Bid shall include the legal name of the Bidder and indicate whether the Bidder is a sole proprietor, partnership, corporation, or other legal entity. Each copy shall be signed by the person or persons legally authorized to bind the Bidder to a contract. A Bid by a corporation shall further give the state of incorporation and have the corporate seal affixed. All names shall be typed or printed in ink below the signatures. The address and phone number for communication regarding the bid shall be shown. Email address may be included at bidder's option.

The Bid shall contain evidence of the Bidder's authority to do business in the Commonwealth of Virginia. Bidder's Virginia State contractor license number shall also be shown on the Bid form.

9. BID BOND

Each bid shall be accompanied by a bid security (on enclosed form or cashier's check), in the amount of five percent (5%) of the bidder's maximum Bid price, pledging that the Bidder will enter into a Contract with the TOWN on the terms stated in the Bid. Should the Bidder refuse to enter into such Contract the amount of the bid security shall be forfeited to the TOWN as liquidated damages, not as a penalty. The amount of the bid security shall not be forfeited to the TOWN in the event the TOWN fails to prove financial capability if requested in writing by the successful bidder. Pursuant to VPPA Section 2.2-4336.

The TOWN will have the right to retain the bid security of Bidders to whom an award is being considered until either (a) the Contract has been executed or (b) the specified time has elapsed so that Bids may be withdrawn, or (c) all Bids have been rejected.

10. SUBMISSION OF BIDS

One paper copy of the Bid, the bid security, and the escrow of retained funds document are required to be submitted, and shall be enclosed in a sealed opaque envelope. The envelope is to be addressed to the party receiving the Bids and is to be identified with the Project name, the Bidder's name and address, and Contractor's Virginia License number. **If the Bid is sent by mail, the sealed envelope is to be enclosed in a separate mailing envelope with the notation "SEALED BID ENCLOSED" on the face thereof.**

The Town of Leesburg will accept bids at the designated location prior to the time and date of the receipt of Bids. Bids received after the time and date for receipt of Bids will be returned unopened. The official time will be deemed to be that of the Town of Leesburg.

The Bidder shall assume full responsibility for timely delivery at the location designated for receipt of Bids. Bids received in any other format than specified are invalid, and will not receive consideration.

11. MODIFICATION/WITHDRAWAL OF BID

A Bid may not be modified, withdrawn, or cancelled by the Bidder during the stipulated time period following the time and date designated for the receipt of Bids, and each Bidder so agrees in submitting a Bid.

Prior to the time and date designated for receipt of Bids, a Bid submitted may be modified or withdrawn by notice to the party receiving Bids at the place designated for receipt of Bids. Such a notice shall be in writing over the signature of the Bidder and shall be received on or before the date and time set for receipt of Bids. A change must indicate which Bid shall be governed and shall be so worded as not to reveal the amount of the original Bid.

Withdrawn Bids may be resubmitted up to the date and time designated for the receipt of Bids, provided that they are then fully in conformance with these Instructions to Bidders.

Bid security, if required, shall be in an amount sufficient for the Bid as modified or resubmitted.

If within two (2) business days after Bids are opened any Bidder files a duly signed written notice, accompanied by original work papers, with the TOWN that there was a material and substantial mistake in the preparation of its Bid, that Bidder may withdraw its Bid, and the Bid security will be returned. This procedure shall follow Section 2.2-4330(B)(1) of the Virginia Public Procurement Act (VPPA). Thereafter, if the Work is re-bid, that Bidder will be disqualified from further bidding on the Work.

12. CONTRACT TYPE

This is a Lump Sum Contract.

Comparison of Bids: Bids will be compared on the basis of a total estimated lump sum price, arrived at by taking the sum of the estimated quantities of such items, in accordance with Town's Estimate of Quantities set forth in the Schedule of Prices, multiplied by the corresponding unit prices, and including any lump sum bids on individual items and allowance items.

Variations of Quantities: Bidders are warned that the Estimate of Quantities on the various items of work and materials is approximate only, given solely to be used as a uniform basis for the comparison of bids, and is not to be considered part of this contract except to establish unit prices to be used for progress payment and change orders. The quantities required to complete the contract work may be less or more than so estimated, and if so, no action for damages or for loss of profits shall accrue to the contractor by reason thereof.

13. CONSIDERATION OF BIDS

The TOWN shall have the right to reject any or all Bids, reject a Bid not accompanied by a required bid security or by other data required by the Bidding Documents, or reject a Bid, which is in any way incomplete or irregular.

14. AWARD

It is the intent of the TOWN to award a Contract to the lowest responsive and responsible Bidder, provided the low bid does not exceed the funds available. The TOWN shall have the right to waive informalities in a Bid received and to accept the Bid, which, in its judgment, is in the TOWN's best

interest. The Notice of Intent to Award a contract resulting from the solicitations for bids will be posted on the Public Notice Board at 25 W. Market Street, Leesburg, VA and on the Town's Bid board (<http://www.leesburgva.gov/bidboard>).

15. NEGOTIATIONS WITH THE LOWEST BIDDER

Unless all bids are cancelled or rejected, the Town reserves the right granted by 2.2-4318 of the *Code of Virginia* to negotiate with the lowest responsive, responsible bidder to obtain a contract price within the funds available. Funds available shall mean those funds, which were budgeted for this contract prior to the issuance of the written Invitation for Bids. Negotiations with the low bidder may include both modifications of the bid price and the Scope of Work/Specifications to be performed. The Town shall initiate such negotiations by written notice to the lowest responsive, responsible bidder that its bid exceeds the available funds and the Town wishes to negotiate a lower contract price. The times, places, and manner of negotiating shall be agreed to by the Town and the lowest responsive, responsible bidder.

16. PROTEST

Any bidder or offeror who desires to protest the award or decision to award a contract shall submit such protest in writing to the TOWN, no later than 10 days after public notice of award or the announcement of the decision to award, whichever occurs first, pursuant to section 2.2-4360 of the VPPA.

17. ACCEPTANCE OF BID (VPPA 2.2-4337)

The bids received shall be open to acceptance and is irrevocable for **sixty (60) days** from the Bid Closing date.

If the bid is accepted by the Town within the period specified above, the Contractor shall provide a certificate of insurance, Payment Bond, and Performance Bond within 10 days of the Notice of Award or Notice of Intent to Award. Each bond, the Performance Bond and the Payment Bond, shall be in the amount of 100% of the Contract Amount. The bonds shall be corporate surety bonds issued by a surety company authorized to do business in the Commonwealth of Virginia and acceptable to the Town. The Performance Bond will be conditioned upon the faithful performance of all of the work shown, described and required in the Contract Documents. The Payment Bond will be conditioned upon the payment of all persons who have and fulfill contracts for the Contractor for providing labor, equipment of material in the performance of the work provided for in the Contract Documents.

If this bid is accepted within the time stated, and the Contractor fails to provide the required Bonds, or commence the project as directed, the security deposit shall be forfeited as damages to the Town by reason of failure, limited in amount to the lesser of the face value of the security deposit or the difference between this Bid and the Bid upon which the Contract is signed.

18. SCC IDENTIFICATION NUMBER (VPPA Section 2.2-4311.2)

Every Bidder must include their State Corporation Commission (SCC) Identification Number or reason for exemption with his/her bid. If this information is not included, the Bid may be rejected.

19. VIRGINIA CONTRACTOR’S LICENSE NUMBER (Code of Virginia §54.1-1115, A1 and A6)

Bidder certifies that he/she is properly registered as a licensed Contractor under Title 54 of the Code of Virginia. Bidder shall provide his/her Virginia Contractor’s License Number in the designated location on the Bid Form or the Bid may be rejected.

20. COORDINATION WITH UTILITIES

The Contractor shall coordinate the work of his forces with the utility companies during the contract to ensure the continuing progress of all work to be performed within the project area.

The Contractor shall notify “MISS UTILITY” at 1-800-552-7001, 72 hours prior to beginning construction.

It shall be the responsibility of the contractor to notify operators who maintain underground utility lines in the area of proposed excavation or blasting at least five (5) working days prior to any construction, subsequent maintenance or repair.

The contractor shall dig test holes over all existing utilities prior to construction to determine their exact location and shall notify the construction manager of any necessity for redesign.

The Contractor shall coordinate with Verizon the necessary adjustment (raising) of a pedestal at the end of the parking lot.

The contractor will also be required to coordinate with Dominion Energy to hold the power pole at the east end of the wall.

21. CONTRACT TIME

The Town has established two interim completion milestones for this project.

- Milestone 1: The contractor shall complete the work upstream of Harrison Street (Phase I) within 120 calendar days from Notice to Proceed.
- Milestone 2: The contractor shall complete the work downstream of Harrison Street (Phase II) within 360 calendar days from Notice to Proceed.

The contractor will be subject to Liquidated Damages if Milestone 1 or Milestone 2 dates are not achieved.

The Contractor shall identify in the Baseline Progress Schedule, each applicable milestone activity with a date equal to Contract specified completion date.

For each milestone, the Contractor shall designate the critical path activities, as reflected on the Baseline Progress Schedule. For the purpose of this requirement, critical path is the longest series of logically sequenced activities from start to finish that defines the overall time to complete a milestone or the project, as applicable.

In the event of an excusable delay for which the Contractor is seeking a time extension, the Contractor shall submit a Schedule Impact Analysis (SIA) using *Contemporaneous Methodology* to substantiate its request for a time extension, according to Section 108.04 of the Virginia Department of Transportation 2016 Road and Bridge Specifications. The Town Engineer will

evaluate the Contractor's request based on the critical path and available total float. Total float is the number of working days that an activity can be delayed before it delays a related provisional milestone or the project.

Project Substantial Completion:	360 calendar days from Notice to Proceed
Project Final Completion:	30 calendar days from Substantial Completion
Liquidated Damages:	\$500.00 per day

22. PAYMENTS

Partial payments will be based on a monthly progress estimate consisting of approximate quantities and value of work performed in accordance with the plans and specifications. The Town will pay amounts owed to the Contractor within forty-five (45) days after an acceptable invoice is rendered in accordance with Section 2.2-4352 of the Virginia Public Procurement Act (VPPA).

In accordance with Section 2.2-4355 of the VPPA, interest shall accrue on all amounts owed by the Town to the Contractor that remain unpaid after seven days following the payment date. The rate of interest charged shall be the base rate on corporate loans (prime rate) at large United States money center commercial banks as reported daily in the publication entitled The Wall Street Journal. Whenever a split prime rate is published, the lower of the two rates shall be used.

23. WORK REQUIREMENTS AND ADDITIONAL INFORMATION

A. Work Hour and Date Restrictions: Work hours will be 7:00 a.m. to 7:00 p.m. Monday through Friday. The Contractor will not be allowed to perform work on the project during any other days or times without prior approval from the Town.

Note that Town Code Section 24-182 (3) b. provides specific prohibitions on construction operations to regulate noise.

The Contractor will not be permitted to work on the following holidays:

New Year's Day	Labor Day	Christmas Day
Memorial Day	Thanksgiving	Day after Christmas
Independence Day	Day after Thanksgiving	

B. Traffic Lanes and Maintenance of Traffic: The Contractor shall conduct its operations in a manner that will ensure that traffic will be uninterrupted except as approved by the Town. At the close of each workday, the contractor shall ensure that all traffic lanes are open and all private entrances and driveways are accessible. The contractor shall make provisions to maintain a safe area for pedestrian traffic at all times during the project. No excavation shall remain open within the roadway without the approval of the Town except when the excavation can be safely bridged with the use of steel plates or other materials acceptable to the Town. When areas of excavation outside of the roadway do remain open, the area shall be barricaded and warning signs shall be posted.

At all times the Contractor shall use the personnel and traffic control signs and devices necessary to comply with the Virginia Department of Transportation *Virginia Work Area Protection Manual* and the Federal Highway Administration *Manual on Uniform*

Traffic Control Devices for Streets and Highways. During the progress of the work when the street may be obstructed to any extent by construction equipment or construction operations, in addition to the signs and barricades, special workers, equipped with VDOT required "STOP\SLOW" double-sided traffic control paddles, shall be designated by the Contractor to direct traffic. These workers so designated shall not be assigned to any other duties while engaged in directing traffic. The workers assigned to the flagging duties shall be VDOT-certified. 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 the Town of Leesburg, 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. This item is to be considered incidental to all other items of work.

The Contractor is required to submit a Maintenance of Traffic Plan for review and approval. Approval of the Maintenance of Traffic Plan is required prior to beginning any construction activities on the project. The Maintenance of Traffic Plan is required for the issuance of the required right-of-way permit issued by the Town of Leesburg. The fee for the Town right-of-way permit will be waived.

- C. Parking Lot:** The Contractor shall minimize the duration of any blockage of access to and usage of the Virginia Knolls townhouse parking lot being reconstructed as part of this project. The Contractor shall notify the Virginia Knolls Home Owners Association a minimum of 48 hours in advance of any activities that will restrict use of the parking lot in any way. The contractor shall make the parking lot safely accessible at the conclusion of each work day, by the use of fencing and/or wheel stops.
- D. Construction Survey:** This item is to include:
- Pre-Construction survey
 - All survey and layout required to build the project
 - Final as-built survey of all storm inverts and top elevations, curb elevations, etc. in accordance with the Town's Design and Construction Standards Manual (DCSM) requirement. The field surveyed as-built information shall be submitted in PDF format.
- E. Rock Excavation:** This is an unclassified excavation lump sum job, it is the bidder's responsibility to estimate the amount of rock excavation required.
- F. Utility Trenches:** Haul-off excavation material shall be incidental to work items and Contractor shall include its cost in relevant pay items. The utility trenches shall be backfilled to the level of the roadway at the end of each work day, except in the location where plates will be used.
- G. Storm Drainage:** All storm drainage installed in paved areas shall be backfilled utilizing 21-A material, from the top of the bedding material used for the pipe to the sub-grade elevation. Storm

drainage installed under sidewalks or grass areas shall be backfilled in accordance with the Town of Leesburg DCSM, and VDOT specifications, whichever is most stringent. Any concrete cradles or piers required for crossing existing sanitary or waterline are to be considered incidental to the storm drainage items of work.

- H. Sanitary Sewer:** All sanitary sewer installed in paved areas shall be backfilled utilizing 21-A material, from the top of the bedding material used for the pipe to the sub-grade elevation. Sanitary sewer installed under sidewalks or grass areas shall be backfilled in accordance with the Town of Leesburg DCSM, and VDOT specifications, whichever is most stringent. Any concrete cradles or piers required for crossing existing sanitary or waterline are to be considered incidental to the sanitary sewer items of work.
- I. Connection to Existing Structures:** Connections made to existing structures shall be accomplished by means that are in accordance with the Town DCSM and VDOT specifications.
- J. Topsoil:** Contractor shall strip the topsoil and stockpile the required quantity for later use/re-spreading.
- K. Tree Protection:** The following work must be accomplished before any demolition or site-clearing activity occurs within 100 feet of the tree(s) to be saved.
 - 1. The Contractor shall meet with the Town Urban Forester at the site prior to beginning work to review all work procedures, access and haul routes, and tree protection measures.
 - 2. The limits of all tree protection zones shall be staked in the field.
 - 3. Tree(s) to be removed that have branches extending into the canopy of tree(s) to remain must be removed by a qualified arborist and not by demolition or construction contractors. A qualified arborist shall remove the tree in a manner that causes no damage to the tree(s) and understory to remain.
 - 4. Any brush clearing required within the tree protection zone shall be accomplished with hand-operated equipment.
 - 5. Trees to be removed shall be felled so as to fall away from tree protection zones and to avoid pulling and breaking of roots of trees to remain. If roots are entwined, the Town Urban Forester may require first severing the major woody root mass before extracting the trees. This may be accomplished by cutting through the roots by hand, with a vibrating knife, rock saw, narrow trencher with sharp blades, and other approved root-pruning equipment.
 - 6. Trees to be removed from within the tree protection zone shall be removed by a qualified arborist. The trees shall be cut near ground level and the stump ground out.
 - 7. All downed brush and trees shall be removed from the tree protection zone either by hand or with equipment sitting outside the tree protection zone. Extraction shall occur by lifting the material out, not by skidding it across the ground.
 - 8. With approval from the Town, brush may be chipped and placed in the tree protection zone to a maximum depth of 6 inches leaving the trunk clear of mulch.
 - 9. Structures and underground features to be removed within the tree protection zone shall use the smallest equipment possible, and operate from outside the tree protection zone. The Town Urban Forester shall be on site during all operations within the tree protection zone to monitor demolition activity.
 - 10. Fences shall be erected to protect trees to be preserved. The tree protection fence shall be meet the requirements of the detail provided and shall be installed generally in locations shown on the plans. The exact location of the tree protection fence shall be determined in the field, and approved by the Town Urban Forester. Fences are to remain until all site

work has been completed. Fences may not be relocated or removed without the written permission of the Town Urban Forester.

11. Any damage to trees designated to be saved, shall be reported to the Town Urban Forester within 6-hours so that remedial action can be taken. Timeliness is critical to tree health.
 12. If temporary haul or access roads must pass over the root area of trees to be retained, a road bed of 6 inches of mulch with ½ inch sheets of plywood on top shall be created to protect the soil. The roadbed material shall be replenished as necessary to maintain a 6-inch depth.
 13. Construction trailers and traffic and storage areas must remain outside fenced areas at all times.
 14. No materials, equipment, spoil, or waste or washout water may be deposited, stored, or parked within the tree protection zone (fenced area).
 15. Additional tree pruning required for clearance during construction must be performed by a qualified arborist and not by construction personnel.
 16. Any herbicides placed under paving materials must be safe for use around trees and labeled for that use. Any pesticides used on site must be tree-safe and not easily transported by water.
 17. Erosion control devices such as silt fencing, debris basins, and water diversion structures shall be installed to prevent siltation and/or erosion within the tree protection zone.
 18. Before grading or excavation for foundations, footings, walls, or trenching, trees shall be root pruned 1 foot outside the tree protection zone by cutting all roots cleanly to a depth of 24 inches. Roots shall be cut by manually digging a trench and cutting expose I roots with a saw, vibrating knife, rock saw, narrow trencher with sharp blades or other approved root-pruning equipment.
 19. Any roots damaged during grading or construction shall be exposed to sound tissue and cut cleanly with a saw.
 20. Maintain fire-safe areas around fenced areas. Also, no heat sources, flames, ignition sources, or smoking is allowed near mulch or trees.
- L. Hydrant Meter:** The contractor is required to obtain a fire hydrant meter from Town's Utility Department to be used for withdrawing water during construction. Any illegal hookup to a fire hydrant will result in a \$1,000 fine for the first offense and a \$2,500 fine for each subsequent offense on the same job.
- M. Damage to Existing Fence:** In the event that a fence is damaged, the Contractor shall replace in kind at no additional cost to the Town.
- N. Erosion and Sediment Control:** The Loudoun County Erosion and Sediment Control inspector or the Town of Leesburg Project Manager may require modification of the erosion and sediment control installation in order to keep the project in compliance with regulations. Contractor will be paid for at the contract bid unit rate.
- O. Dust Control:** The Contractor shall make every effort to control dust on site and shall either use water or a dust control agent.
- P. Test Pits:** Test pits as described on the plans in the General Notes and as required by Miss Utility, are to be considered incidental to all other line items of work.
- Q. Geotechnical Report:** Subsurface investigations were performed for the project during design. A copy of the full geotechnical report prepared by GeoConcepts, dated May 10, 2017 is attached.

R. **As-Built Drawings:** As per Article 4.13 and DCSM requirements.

S. **Project Sign:** The contractor shall provide and erect project signs at a locations approved by the Town. The sign shall be in general conformance with the following drawing.

60"

Leesburg

TOWN OF LEESBURG
Capital Project

TUSCARORA CREEK

Flood Mitigation & Stream Restoration Project

Completion: Spring 2020
For more information, call 703-737-7055

Contractor:
XYZ Company
Anytown, Virginia

48"

Burgundy: PMS 188
C: 0
M: 97
Y: 100
K: 50

R: 17
G: 6
B: 0

Gold: PMS 130
C: 0
M: 30
Y: 100
K: 0

R: 255
G: 179
B: 0

Dark Blue: PMS 2767
C: 100
M: 78
Y: 0
K: 54

R: 6
G: 16
B: 65

END OF SECTION

END OF DOCUMENT

THE TOWN OF LEESBURG

GENERAL CONDITIONS

Project Name:

Tuscarora Creek Stream Restoration and Flood Mitigation

IFB No. : 06306-FY19-23

GENERAL CONDITIONS

THE TOWN OF LEESBURG

GENERAL CONDITIONS

ARTICLE 1: CONTRACT DOCUMENTS

1.1 DEFINITIONS

1.1.1 The Contract Documents

The Contract Documents consist of the Advertisement or Invitation for Bids, Request for Proposals, Information for Bidders, Insurance Certificates, Official Bid Form, Offeror's Bid or Proposal, Bonds, the Notice of Award, the Project Manual, the Owner/Contractor Agreement, the General and Special Conditions, the Drawings, the Specifications, all Addenda issued prior to and all Modifications issued after execution of the Agreement. A Modification is either a written Change Order issued pursuant to the provisions of Article 12.5, or a Field Order issued pursuant to Article 12.2.

1.1.2 The Contract

The Contract is the sum of all the Contract Documents. This Contract represents the entire and integrated agreement between the Owner and the Contractor and supersedes all prior negotiations, representations, or agreements, either written or oral. The Contract may be changed only by a Modification as defined in Article 1.1.1.

1.1.3 The Work

The Work comprises the completed construction required by the Contract Documents and includes all labor, material, equipment, supplies and other facilities or things necessary to produce such construction, and all materials, equipment and supplies incorporated or to be incorporated in such construction.

1.1.4 The Project

The Project is the total construction of which the Work performed under the Contract Documents may be the whole or a part.

1.1.5 Furnish, Install, Provide

The terms "Furnish", "Install" or "Provide," unless specifically limited in context, mean: furnishing and incorporating a specified item, product or material in the Work, including all labor, materials, and equipment necessary to perform the Work required, ready for intended use.

1.1.6 Firm, Fixed Price or Lump Sum

The terms "Firm, Fixed Price" or "Lump Sum" mean that the Contract Work shall be performed for the price stated in the Contract without any adjustment based on

GENERAL CONDITIONS

the Contractor's actual costs unless such adjustment is made by a properly executed Contract Change or Modification.

1.1.7 Schedule of Values

The term "Schedule of Values" means the unit prices for portions of the Work submitted by the Contractor and approved by the Owner's Project Manager for use in preparing Applications for Payment and pricing Contract Changes in accordance with Article 9.2. The Schedule of Values shall not alter the Firm, Fixed Price or Lump Sum value of the Contract.

1.1.8 Miscellaneous Words or Terms

Whenever they refer to the Work or its performance, "Directed," "Required," "Permitted," "Ordered," "Designated," "Prescribed," and words of like import shall imply the direction, requirements, permission, order, designation or prescription of the Owner and/or the Owner's Project Manager, and "Approved," "Acceptable," "Satisfactory," "in the judgment of," and words of like import shall mean approved by or acceptable to or satisfactory to or in the judgment of the Owner and/or the Owner's Project Manager. "Approved" means approved in writing, including subsequent written confirmation of prior oral approval and "Approval" means approval in writing, including all aforesaid.

1.2 EXECUTION, CORRELATION AND INTENT

1.2.1 The Contract Documents may be signed in duplicate originals by the Owner and the Contractor and each set shall be deemed an original, but all sets shall constitute one and the same instrument.

1.2.2 By executing the Contract, the Contractor represents that he has familiarized himself with, and assumes full responsibility for having familiarized himself with, the nature and extent of the Contract Documents, Work, locality, and with all local conditions and federal, state and local laws, ordinances, rules and regulations that may in any manner affect performance of the Work, and represents that his study and observations have been correlated with the requirements of the Contract Documents. The Contractor also represents that he has studied all surveys and investigation reports of subsurface and latent physical conditions referred to in the Contract Documents and made such additional surveys and investigations as he deems necessary for the performance of the Work at the Contract Price in accordance with the requirements of the Contract Documents and that he has correlated the results of all such data with the requirements of the Contract Documents. Failure to make an examination necessary for this determination shall not release the Contractor from the obligations of this Contract nor be grounds for any claim based upon unforeseen conditions.

GENERAL CONDITIONS

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

- 1.2.3** The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the Work. The Contract Documents are complementary, and what is required by any one shall be as binding as if required by all. Should any work or material be required which is not denoted in the drawings and specifications either directly or indirectly, but which is nevertheless necessary for the proper carrying out of the intent thereof, it is understood and agreed that the same is implied and required and that the Contractor shall perform such work and furnish such materials as fully as if they were completely delineated and prescribed.

Words and abbreviations which have well-known technical or trade meanings are used in the Contract Documents in accordance with such recognized meanings unless otherwise specifically defined herein. The Table of Articles, titles, headings, and running headlines are solely to facilitate reference to various provisions of the Contract Documents and in no way affect, limit or cast light upon the interpretation of the provisions to which they refer.

- 1.2.4** The organization of the specifications into divisions, sections and articles, and the arrangement of drawings are for clarity only, and shall not control the Contractor in dividing the Work among Subcontractors or in establishing the extent of Work to be performed by any trade. The Contractor may subcontract the Work in such divisions as he sees fit and he is ultimately responsible for furnishing all work shown on the drawings and/or in the specifications.

- 1.2.5** Unless otherwise provided for or amended herein, work shall be performed in accordance with the VDOT Road and Bridge Specifications, current edition; the Town of Leesburg Design and Construction Standards Manual (DCSM), current edition; the Virginia Erosion and Sediment Control Handbook; and the Special Provisions, Special Conditions, and Special Designs as may be described on the plans for the project or in this solicitation. Where there is a conflict between the VDOT Road and Bridge Specifications and the DCSM, the most stringent shall take precedence. A copy of the DCSM may be purchased from the Department of Plan Review at the current standard rate.

Anything shown on the drawings and not mentioned in the specifications or mentioned in the specifications and not shown on the drawings shall have the same effect as if shown or mentioned respectively in both. Technical specifications take priority over general specifications and detail drawings take

GENERAL CONDITIONS

precedence over general drawings. Any work shown on one drawing shall be construed to be shown in all drawings and the Contractor will coordinate the Work and the drawings. If any portion of the Contract Documents shall be in conflict with any other portion, the various documents comprising the Contract Documents shall govern in the following order of precedence: The Owner/Contractor Agreement; Modifications; Changes; Addenda; the Supplementary Conditions; the General Conditions; the Specifications; the drawings; the Town DCSM; other published construction standards and specifications; the bonds; the advertisement for bids or invitation or request for proposal; information for bidders; bids; the notice of award. As between schedules and information given on drawings and the scaled measurements, the figures shall govern. As between large-scale drawings and small-scale drawings, the larger scale shall govern. Any such conflict or inconsistency between or in the drawings shall be submitted to the Project Manager whose decision thereon shall be final and conclusive.

1.2.6 This Contract is not intended to create, nor shall any provision be interpreted as creating, any contractual relationship between the Owner and any third parties including all Subcontractors.

1.2.7 The Provisions of this Contract cannot be changed, varied or waived in any respect except by a written Modification or Change Order. No person has authority to orally waive, or to release the Contractor from any of the Contractor's duties or obligations under or arising out of this Contract. Any waiver, approval or consent granted by Changes to the Contractor shall be limited to those matters specifically and expressly stated thereby to be waived, approved or consented to and shall not relieve the Contractor of the obligation to obtain any future waiver, approval or consent.

1.3 OWNERSHIP AND USE OF DOCUMENTS

1.3.1 All drawings, specifications, and copies thereof furnished by or to the Owner under this Contract are and shall remain the property of the Owner. They are to be used only with respect to this Project and are not to be used in whole or in part for any other purpose.

1.3.2 The Contractor shall be provided five sets of the Contract Documents by the Owner's Project Manager. Additional sets of Drawings and Specifications may be obtained from the Owner's Project Manager by paying the then current and regular printing, mailing and handling charges.

END OF ARTICLE 1

GENERAL CONDITIONS

ARTICLE 2: OWNER'S PROJECT MANAGER

2.1 DEFINITIONS

2.1.1 The term "Project Manager" as used in the Contract Documents, shall mean the entity so identified in the Owner/Contractor Agreement or its duly authorized representatives.

2.1.2 The Project Manager is referred to throughout the Contract Documents as if singular in number and masculine in gender.

2.2 SERVICES OF THE OWNER'S PROJECT MANAGER

2.2.1 The Owner's Project Manager will serve during construction and until the end of the warranty period. The Owner's Project Manager will advise and consult with the Owner and will have the authority to act on behalf of the Owner only to the extent provided in the Contract Documents. The Owner may identify a substitute Owner's Project Manager at any time by providing written notice to the Contractor.

2.2.2 The Owner's Project Manager will inform the Owner and the Contractor whenever in his reasonable opinion any of the Work is proceeding contrary to the requirements of the Contract Documents and will be unacceptable. Failure of the Contractor to take corrective action to make the Work conform to the Contract Documents will subject the Contractor to any and all remedies available to the Owner, including, without limitation, termination pursuant to Article 14. Such notification by the Owner's Project Manager will not be a cause for the Contractor to claim either delay of the Work or any increase in the Contract Price.

2.2.3 The Owner, the Owner's Project Manager and other government representatives shall at all times have access to the Work wherever it is in preparation or progress, to include off-site facilities of Subcontractors and suppliers at any tier. The Contractor shall provide safe facilities for such access so the Owner's Project Manager may perform his functions under the Contract Documents.

2.2.4 All communications, correspondence, submittals and documents exchanged between the Owner's Project Manager and the Contractor in connection with the Project shall be through or in the manner prescribed by the Owner and consistent with the Owner/Contractor Agreement.

2.2.5 The Owner's Project Manager shall make decisions on all matters relating to aesthetic effect, which decision shall be final.

END OF ARTICLE 2

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ARTICLE 3: OWNER

3.1 DEFINITIONS

- 3.1.1** "Owner" means the Town of Leesburg, Virginia, unless the Owner/Contractor Agreement provides otherwise. The Owner shall be referred to as the "Town," or as the "Owner."
- 3.1.2** The term "Owner" or "Owner's Project Manager" specifically excludes any and all inspectors having building code or Town ordinance responsibilities or jurisdiction under the requirements of the Building Permit, unless the Owner designates such person to serve as the Owner's Representative.
- 3.1.3** "Contractor" means the person or persons, firm or company whose bid or proposal has been accepted by the Owner and includes the Contractor's representatives, successors and assigns as permitted by the Owner.

3.2 INFORMATION, SERVICES AND RIGHTS OF THE OWNER

- 3.2.1** The Project Manager will provide administration of the Contract as described below.
- 3.2.2** The Owner or, at the Owner's sole discretion, the Owner's Project Manager or Project Manager, will review and process all Progress Payments, including the Final Payment.
- 3.2.3** The Project/Manager shall have the authority to reject the Work when, in his opinion, the Work does not conform to the Contract Documents.
- 3.2.4** Whenever in the Project Manager's reasonable opinion it is necessary or advisable for the implementation of the Contract Documents, the Project Manager will have authority to require special inspection or testing of the Work in accordance with the provisions of the Contract Documents, whether or not such Work is then fabricated, installed or completed.
- 3.2.5** The Owner or the Owner's Project Manager shall at all times have access to the Work wherever it is in preparation or progress. The Contractor shall provide safe facilities for such access.
- 3.2.6** The Owner, the Owner's Project Manager and the Engineer shall not be responsible for or have control or charge of the construction means, methods, techniques, sequences, or procedures, or for the safety precautions and programs in connection with the Work, and will not be responsible for the Contractor's failure to carry out the Work in accordance with the Contract Documents.

GENERAL CONDITIONS

- 3.2.7** The Owner or the Owner's Project Manager shall not be responsible or liable to the Contractor for the acts, errors or omissions of the Contractor, any separate Subcontractor, any separate Contractor or any Contractor's or Subcontractor's agents or employees, or any other persons performing any of the Work.
- 3.2.8** The Owner assumes no responsibility for any conclusions or interpretations made by the Contractor based on the information made available by the Owner. The Owner assumes no responsibility for any understanding reached or representation made concerning conditions that can affect the Work by any of its officers or agents before the execution of this Contract, unless that understanding or representation is expressly set forth in this Contract.
- 3.2.9** The Owner shall not be held responsible for failure to perform the duties and responsibilities imposed by the Contract if such failure is due to strikes, fires, riots, rebellions, or Force Majeure, beyond the control of the Owner, that make performance impossible or illegal, unless otherwise specified in the Contract.
- 3.2.10** The Owner will, throughout the Contract Time and any extension thereof have the right of reasonable rejection and approval of staff assigned to the project by the Contractor. If the Owner reasonably rejects staff or Subcontractors, the Contractor must provide replacement staff or Subcontractors satisfactory to the Owner in a timely manner and at no additional cost to the Owner.
- 3.2.11** The foregoing rights are in addition to other rights of the Owner enumerated herein and those provided by law.

3.3 OWNER'S RIGHT TO STOP OR TO SUSPEND WORK

- 3.3.1** If the Contractor fails to correct defective Work as required by Article 13.2 "CORRECTION OF WORK," or fails to carry out the Work or supply labor and materials in accordance with the Contract Documents, the Owner by written order may order the Contractor to stop the Work, or any portion thereof, without monetary compensation to the Contractor until the cause for such order has been eliminated.
- 3.3.2** The Owner may order the Contractor in writing to suspend, delay, or interrupt all or any part of the Work for such period of time as he may determine to be appropriate for the convenience of the Owner.
- 3.3.3** If the performance of all or any part of the Work is suspended, delayed, or interrupted by the Owner or the Owner's Project Manager for an unreasonable period of time, or by failure of either of them to act within the time specified (or if no time is specified, within a reasonable time), an adjustment increasing the time of performance of the Work shall be made. Such adjustments will be made solely for unreasonable suspension, delay, or interruption. The Contract shall be

GENERAL CONDITIONS

modified in writing accordingly. However, no claim for an extension of time shall be made under this Article 3.3.3 for any suspension, delay, or interruption pursuant to Article 3.4.1, or for which claim is provided or excluded under any other provision of this Contract.

No claim under this Article 3.3.3 shall be allowed for any claim for an extension of time required for performance, unless within twenty days after the act or failure to act involved, the Contractor submits to the Owner's Project Manager a written statement setting forth, as then practicable, the extent of such claimed time extension and unless the claim for an extension of time is submitted with supporting data within thirty days after the termination of such suspension, delay, or interruption.

3.3.4 In the event of a suspension of work or delay or interruption of work, the Contractor will and will cause his Subcontractors to protect carefully his, and their, materials and work against damage from the weather and maintain completed and uncompleted portions of the work as required by the Contract Documents. If, in the opinion of the Owner's Project Manager, any work or material shall have been damaged by reason of failure on the part of the Contractor or any of his Subcontractors to protect same, such work and materials shall be removed and replaced at the expense of the Contractor.

3.3.5 No claim by the Contractor under Article 3.3.3 shall be allowed if asserted after Final Payment under this Contract.

3.4 OWNER'S RIGHT TO CARRY OUT THE WORK

3.4.1 If the Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents and fails within a seven day period after receipt of written notice from the Owner to commence and continue correction of such default or neglect with diligence and promptness, the Owner may after the seven day period give the Contractor a second written notice to correct the deficiencies within a three day period. If the Contractor fails to commence and continue to correct any deficiencies within the second notice's three day period, the Owner may, without prejudice to other remedies the Owner may have, correct such deficiencies. In such a case an appropriate Change Order shall be issued pursuant to Article 12 deducting from the payments then or thereafter due the Contractor the cost of correcting such deficiencies, including compensation for services of the Owner's Project Manager, the Engineer and any other additional services made necessary by such default, neglect or failure. If the payments then or thereafter due the Contractor are not sufficient to cover such amount, the Contractor shall pay on demand the difference to the Owner.

3.4.2 The Owner will not be liable or accountable to the Contractor for the method by which the Work, or any portion thereof, performed by the Owner or by separate

GENERAL CONDITIONS

contractors pursuant to Article 3.4 is accomplished or for the price paid therefor. Notwithstanding the Owner's right to carry out a portion of the Work, maintenance and protection of the Work remains the Contractor's responsibility.

3.5 EXAMINATION OF RECORDS

3.5.1 The Owner, or any duly authorized representative, shall, until the expiration of five years after final payment hereunder, have access to and the right to examine, audit and copy any directly pertinent books, documents, as-builts, papers and records of the Contractor involving transactions related to this Contract. Any audit or examination shall occur during regular business hours and not exceed a reasonable period of time under the circumstances.

3.5.2 The Contractor further agrees to include in any subcontract for more than \$10,000 entered into as a result of this Contract, a provision to the effect that the Subcontractor agrees that the Owner or any duly authorized representative shall, until the expiration of three years after final payment under the Contract, have access to and the right to examine, audit and copy, without charge, any directly pertinent books, documents, papers and records of such contractor involved in transactions related to such subcontract, or this Contract. The term subcontract shall exclude subcontracts or purchase orders for public utility services at rates established for uniform applicability to the general public.

3.5.3 The period of access provided in Subparagraphs 3.5.1 and 3.5.2 above shall continue for all contracts and subcontracts until any appeals, litigation, or claims have been finally concluded.

3.5.4 Nothing in these General Conditions shall be deemed to modify in any manner any applicable statute of limitations.

END OF ARTICLE 3

GENERAL CONDITIONS

ARTICLE 4: CONTRACTOR

4.1 DEFINITION

4.1.1 The Contractor is the person or organization identified as such in the Owner/Contractor Agreement. The term Contractor means the Contractor or his authorized representative, who shall have authority to bind the Contractor in all matters pertinent to this Contract.

4.1.2 The Contractor is not an agent for the Owner but is an independent contractor engaged in the business of providing the services and performing the Work described in the Contract Documents.

4.2 REVIEW OF CONTRACT DOCUMENTS

4.2.1 Before submitting his bid or proposal to the Owner, and continuously after execution of the Contract, the Contractor shall carefully study and compare the Contract Documents and shall at once report to the Owner any error, inconsistency or omission he may discover, including any requirement that may be contrary to any law, ordinance, rule, regulation or order of any public authority bearing on the performance of the Work. By submitting his bid or proposal for the Contract and the Work under it, the Contractor agrees that the Contract Documents are accurate, consistent and complete. The Contractor shall perform no portion of the Work at any time without Contract Documents and, where required, approved Shop Drawings, product data, samples, mock ups or other submittals for such portion of the Work

4.3 SUPERVISION AND CONSTRUCTION PROCEDURES

4.3.1 The Contractor shall supervise and direct the Work, using his best skill and attention. He shall be solely responsible for and have control over all construction means, uses, sequences, procedures, safety precautions and programs, and coordination of all portions of the Work under the Contract.

4.3.2 The Contractor shall be responsible to the Owner for the acts and omissions of his employees, Subcontractors, Suppliers, their agents and employees, and other persons performing any of the Work and for their compliance with each and every requirement of the Contract Documents, in the same manner as if they were fully employed by the Contractor.

4.3.3 The Contractor shall not be relieved from his obligations to perform the Work in accordance with the Contract Documents either by acts, failures to act or duties of the Owner or the Owner's Project Manager in their administration of the Contract, or by inspections, tests, or approvals (or the lack thereof) required or

GENERAL CONDITIONS

performed under Article 4.4 "INSPECTION OF CONSTRUCTION" or Article 7.5 "TESTS" by persons other than the Contractor.

4.3.4 The Contractor shall employ no plant, equipment, materials, methods or persons to which the Owner or Owner's Project Manager reasonably objects.

4.3.5 The Contractor shall not remove any portion of the Work or stored materials from the site of the Work, if payment for such was requested or received from the Owner.

4.3.6 The Contractor shall at all times so conduct its work as to ensure the least possible obstruction to traffic and inconvenience to the general public and the residents in the vicinity of the Work. No road or street shall be closed to the public except with the permission of the Town Traffic Engineer and proper governmental authority. Fire hydrants on or adjacent to the Work shall be kept accessible to fire fighting equipment at all times. Temporary provisions shall be made by the Contractor to ensure the use of sidewalks and the proper functioning of all gutters, drainage inlets, drainage ditches, and irrigation ditches, which shall not be obstructed except as approved by the Owner's Project Manager.

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

4.3.8 The Contractor shall provide and maintain such sanitary accommodations for the use of the Contractor's employees and those of its Subcontractors as may be necessary to comply with the requirements and regulations of the local and State departments of health and where additional accommodations are necessary for a reasonably sanitary activity, then such additional accommodations shall be made by the Contractor.

4.4 INSPECTION OF CONSTRUCTION

4.4.1 The Contractor shall maintain an adequate inspection system and perform such inspections as will ensure that the Work called for by this Contract conforms to Contract requirements. The Contractor shall maintain complete inspection records and make them available to the Owner and Owner's Project Manager. All work is subject to inspection and testing at all places and at all reasonable times before acceptance to ensure strict compliance with the terms of the Contract.

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4.5 CONTRACTOR'S REPRESENTATIONS

4.5.1 By entering into this Contract with the Owner, the Contractor represents and warrants the following, together with all other representations and warranties in the Contract Documents:

- .1 That he is experienced in and competent to perform the type of work required and to furnish the plant, materials, supplies or equipment to be so performed or furnished by him;
- .2 That he is financially solvent, able to pay his debts as they mature, and possessed of sufficient working capital to initiate and complete the Work and Changes required under the Contract;
- .3 That he is familiar with all laws, ordinances, permits, regulations and resolutions that may in any way affect the Work or those employed therein, including but not limited to any special laws or regulations related to contractor licenses and/or registrations for the Work or any part thereof;
- .4 That such temporary and permanent work required by the Contract Documents that is to be done by him will be satisfactorily constructed and fit for use for its intended purpose and that such construction will not injure any person, or damage any property;
- .5 That he will fully comply with all requirements of the Contract Documents;
- .6 That he will perform the Work in a skillful manner consistent with good workmanship, sound business practice, and in the most expeditious and economical manner consistent with the best interests of the Owner;
- .7 That he will furnish efficient business administration and experienced superintendence and an adequate supply of workers, equipment, tools, and materials at all times;
- .8 That he has carefully reviewed the Work required and that the Work can be planned and executed in a normal and orderly sequence and be reasonably scheduled so as to insure completion of the Work in accordance with the Contract Documents, allowing for normal and reasonably foreseeable weather, labor

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and other delays, interruptions and disruptions of the Work at the site designated;

- .9 That he will complete the Work within the Contract Time and all portions thereof within any required Contract milestones;
- .10 That his Contract Price is based upon the labor, materials, systems and equipment required by the Contract Documents, without exception;
- .11 That he does not and will not during the performance of the Contract violate the provisions of the Federal Immigration Reform and Control Act of 1986, as amended, which prohibits the employment of illegal aliens, and Federal and State employment and wage hour laws;
- .12 That he has taken steps reasonably necessary to ascertain the nature and locations of the Work of the Contract, has investigated and satisfied himself as to the general and local conditions which can affect the Work or its cost, including but not limited to: conditions bearing upon transportation, disposal, handling, and storage of materials; the availability of labor, water, electric power, and roads; uncertainties of weather, river stages, tides, or similar physical conditions at the site; the conformation and conditions of the ground; and the character of equipment and facilities needed before and during work performance;
- .13 That no employee of the Owner shall be admitted to any share or part of this Contract or to any benefit that may arise therefrom which is not available to the general public; and
- .14 That Contractor's bid or offer was made without collusion or fraud and that it has not offered or received any kickbacks or inducements from any other offeror, supplier, manufacturer, or Subcontractor and that it has not conferred on any public employee having official responsibility for this purchase 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. Contractor acknowledges that this Contract incorporates by reference the Virginia Public Procurement Act, VA Code Sect. 2.2-4300 *et seq.* (VPPA), as well as any state or federal law related to ethics, conflicts of interest, or bribery, including by way of illustration and not limitation, the Virginia State and Local Government Conflict of Interests Act, the

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Virginia Governmental Frauds Act, and Articles 2 and 3 of Chapter 10 of Title 18.2 of the Virginia Code, as amended.

4.6 LABOR AND MATERIALS

4.6.1 Unless otherwise provided in the Contract Documents, the Contractor shall provide and pay for all labor, materials, equipment, supplies, tools, construction equipment and machinery, heat, utilities, transportation, and other facilities and services necessary or proper for or incidental to the execution and completion of the Work required by and in accordance with the Contract Documents and any applicable code or statute, whether specifically required by the Contract Documents, or whether their provision may reasonably be inferred as necessary to produce the intended results, whether temporary or permanent and whether or not incorporated or to be incorporated in the Work. Unless otherwise specified, all materials and equipment incorporated in the Work under the Contract shall be new. All work performed, shall be accomplished by persons qualified in the respective trades. Final Payment will not be made until the Work is so completed.

4.6.2 Whenever materials or equipment are specified or described in the Drawings or Specifications by using the name of a proprietary item or the name of a particular manufacturer, fabricator, supplier, or distributor, the naming of the item is intended to establish the type, function, and quality required. Unless the name is followed by words indicating that no substitution is permitted, materials or equipment of other manufacturers, fabricators, suppliers or distributors may be accepted by the Owner's Project Manager if sufficient information is submitted by the Contractor to allow the Owner's Project Manager to determine that the material or equipment proposed is equivalent to that name.

4.6.3 Requests for review of substitute items of material and equipment will not be accepted by the Owner's Project Manager from anyone other than the Contractor. If the Contractor wishes to furnish or use a substitute item of material or equipment, the Contractor shall make written application to the Owner's Project Manager for acceptance thereof, certifying that the proposed substitute will perform adequately the functions called for by the general design, be similar and of equal or better substance to that specified, and be suited to the same use and capable of performing the same or better function as that specified. The application shall state whether or not acceptance of the substitute for use in the Work will require a change in the drawings or specifications to adapt the design to the substitute and whether or not incorporation or use of the substitute in connection with the Work is subject to payment of a license fee or royalty. All variations of the proposed substitute from that specified shall be identified in the application and available maintenance, repair, and replacement service shall be indicated.

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4.6.4 The Contractor shall submit complete data substantiating compliance of the proposed substitution with the Contract Documents, including:

- .1 Product identification including manufacturer's name, address and phone number;
- .2 Manufacturer's literature showing complete product description, performance and test data, and all reference standards;
- .3 Samples and colors in the case of articles or products;
- .4 Name and address of similar projects on which the product was used and date of installation;
- .5 For construction methods, include a detailed description for the proposed method and drawings illustrating same;
- .6 Itemized comparison of proposed substitution with product or method specified and any cost reduction which shall benefit the Owner;
- .7 Accurate cost data on proposed substitution with product or method specified and any cost reduction which shall benefit the Owner;
- .8 All directions, specifications and recommendations by manufacturers for installation, handling, storing, adjustment and operation; and
- .9 A mock up if determined necessary by the Project Manager.

4.6.5 The Contractor shall also submit with his request for approval a sworn and notarized statement that shall include the following representations:

- .1 That he has investigated the proposed product or method and determined that it is equal or better in all respects to that specified and that it fully complies with all requirements of the Contract Documents;
- .2 That he will meet all Contract obligations with regard to the substitution;
- .3 That he will coordinate installation of accepted substitutions into the Work, making all such changes and any required schedule

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adjustment, at no additional cost to the Owner, as may be required for the Work to be complete in all respects;

- .4 He waives all claims for additional costs and additional time related to substitutions which consequently become apparent. He also agrees to hold the Owner harmless from claims for extra costs and time incurred by other Subcontractors and suppliers, or additional services which may have to be performed by the Owner's Project Manager, for changes or extra work that may, at some later date, be determined to be necessary in order for Work to function in the manner intended in the Contract Documents;
- .5 He will provide the same warranty and guarantee, and perform any work required in accordance therewith, for the substitution that is applicable to the specified item for which the substitution is requested;
- .6 Material will be installed, handled, stored, adjusted, tested, and operated in accordance with the manufacturers' recommendations and as specified in the Contract Documents;
- .7 In all cases new materials will be used unless this provision is waived by notice from the Owner or the Owner's Project Manager or unless otherwise specified in the Contract Documents;
- .8 All material and workmanship will be in every respect in accordance with that which, in the opinion of the Owner or the Owner's Project Manager, is in conformity with approved current practice;
- .9 He has provided accurate cost data on the proposed substitution in comparison with the product or method specified; and
- .10 He has taken into consideration the necessary adjustment, relocation and/or installation of public utilities in areas within the limits of this Contract. No additional compensation will be paid to the Contractor for delays to the project schedule, work interruptions, changes in construction sequences, changes in handling excavation, drainage or paving, or for changes in types of equipment used, etc., caused by complying with the provisions of this statement. The Contractor shall include activities in its initial schedule indicating the utility relocation necessary to complete the Work. Delays to the project schedule caused by untimely relocations of utilities will not be considered a compensable delay, but if supported in accordance with the

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provisions of Article 8.3, may entitle the Contractor to a non-compensable time extension. The Contractor shall assume all responsibility for coordinating with the various utility companies to verify their relocation schedules, determine the anticipated duration to complete the respective utility relocations, and to facilitate utility relocations to minimize the impact to the project schedule upon notification of being named the apparent low bidder.

- 4.6.6** The application shall also contain an itemized estimate of all costs that will result directly or indirectly from acceptance of such substitute, including costs of redesign and claims of other contractors affected by the resulting change. All of the foregoing shall be considered by the Owner's Project Manager in evaluating the proposed substitute. The Owner's Project Manager may require the Contractor to furnish at the Contractor's expense additional data about the proposed substitute. The Owner shall be the sole judge of acceptability, and no substitute shall be ordered or installed without the Owner's prior written acceptance. The Owner may require the Contractor to furnish at the Contractor's expense a special performance guarantee or other surety with respect to any substitute.
- 4.6.7** If a substitution is approved, no additional change in brand or make will be permitted unless satisfactory written evidence is presented to and approved by the Owner showing that the manufacturer cannot make scheduled delivery of the approved substituted item. Substitutions will not be considered by the Owner if:
- .1 The proposed substitution is indicated or implied on the Contractor's shop drawing or product data submittals and has not been formally submitted for approval by the Contractor in accordance with the above-stated requirement; or
 - .2 Acceptance of the proposed substitution will require substantial revisions to the Contract Document or is otherwise not acceptable to the Owner or his authorized representative.
- 4.6.8** The Contractor shall not have any right of appeal from the decision of the Project Manager rejecting any materials submittal.
- 4.6.9** Manufactured articles, material and equipment shall be applied, installed, connected, erected, used, cleaned, and conditioned as directed by the manufacturer unless herein specified to the contrary.
- 4.6.10** Any material specified by reference to the number, symbol or title of a specific standard, such as a Commercial Standard, a Federal Specification, a Trade Association Standard, or other similar standard, shall comply with the

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requirements in the latest revision of the standards or specification and any amendment or supplement, except as limited to type, class or grade, or as modified in such reference. The standard referred to, except as modified in the Specifications, shall have full force and effect as though printed in the Specifications.

- .1 Reference in the Specifications or on the Drawings to any article, device, product, material, fixture, form or type of construction by name, make or catalog number shall be interpreted as establishing a standard of quality and shall not be construed as eliminating from competition other products of equal or better quality by other manufacturers where fully suitable, as approved by the Owner's Project Manager. Applications for approval of substitutions for the specified items will be considered only upon request of the Contractor, not of individuals, trades or suppliers, and only for a specific purpose; no blanket approvals will be granted. No approval of a substitution shall be valid unless it is in written form and signed by the Owner's Project Manager.
- .2 If any proposed substitution will affect a correlated function, adjacent construction or the work of other contractors, then the necessary changes and modifications to the affected work shall be considered as an essential part of the proposed substitution, to be accomplished by the Contractor without additional expense to the Owner, if and when approved. Detail drawings and other information necessary to show and explain the proposed modifications shall be submitted with the request for approval of the substitution.

4.6.11 All equipment, apparatus, or devices of any kind to be incorporated into the Work that are shown or indicated on the drawings or called for in the specifications or required for the completion of the Work shall be entirely satisfactory to the Owner's Project Manager as regards operations, capacity, or performance. No approval, either written or oral, of any drawings, descriptive data, or samples of such equipment, apparatus, or device shall relieve the Contractor of his responsibility to turn over the same in good working order for its intended purpose at the completion of the Work in complete accordance with the Contract Documents. Any equipment, apparatus and/or device not fulfilling these requirements shall be removed and replaced by proper and acceptable equipment, or put in good working order satisfactory to the Owner's Project Manager without additional cost to the Owner.

4.6.12 The Contractor shall at all times enforce strict discipline and good order among his employees and shall not employ on the Work any unfit person or anyone not skilled in the task assigned to him. The Owner may, by written notice, require

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the Contractor to remove from the Work any employee the Owner deems incompetent, careless or otherwise objectionable.

4.7 WARRANTY

4.7.1 The Contractor guarantees and warrants to the Owner all work as follows:

- .1 That all materials and equipment furnished under this Contract will be new and the best of its respective kind unless otherwise specified;
- .2 That all Work will comply with or exceed industry standards and be free of omissions and faulty, poor quality, imperfect or defective materials or workmanship;
- .3 That where no standard is specified for such workmanship or materials, they shall be the best of their respective kinds;
- .4 That all applicable Work shall be entirely watertight and leakproof in accordance with all applicable industry customs and practices, and shall be free of shrinkage and settlement;
- .5 That the Work, including but not limited to, mechanical and electrical machines, devices and equipment shall be fit and fully usable for its intended and specified purpose and shall operate satisfactorily with ordinary care;
- .6 That consistent with requirements of the Contract Documents, the Work shall be installed and oriented in such a manner as to facilitate unrestricted access for the operation and maintenance of fixed equipment; and
- .7 That the Work will be free of abnormal or unusual deterioration that occurs because of poor quality materials, workmanship or unsuitable storage.

4.7.2 All work not conforming to guarantees and warranties specified in the Contract Documents, including substitutions not properly approved and authorized, may be considered defective. If required by the Owner's Project Manager, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment. This warranty is not limited by the provisions of Article 13 "UNCOVERING AND CORRECTION OF WORK."

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- 4.7.3** The warranties set forth in this Article 4.7 and elsewhere in the Contract Documents shall survive Final Completion of the Work under Article 9.8 "FINAL COMPLETION AND FINAL PAYMENT."
- 4.7.4** If, within one year after the Date of Final Acceptance of the Work or designated portion thereof or within one year after acceptance by the Owner of designated equipment or within such longer period as may be prescribed by law or by the terms of the applicable special warranty required by the Contract Documents, any of the Work is found to be defective, not in accordance with the Contract Documents, or not in accordance with the guarantees and warranties specified in the Contract Documents, the Contractor shall correct it within five working days, or such other period as agreed, after receipt of written notice from the Owner or Owner's Project Manager to do so.
- 4.7.5** If at any time deficiencies in the Work are discovered that are found to have resulted from latent defects, gross mistakes, fraud or misrepresentation by the Contractor, any Subcontractor or Supplier, the Contractor will be liable for replacement or correction of such Work or any damage that the Owner has incurred, or will incur, related thereto, regardless of the time limit of any guarantees or warranty.
- 4.7.6** Any materials or other portions of the Work, installed, furnished, or stored on site that are not of the character or quality required by the specifications, or are otherwise not acceptable to the Owner's Project Manager shall be immediately removed and replaced by the Contractor to the satisfaction of the Owner's Project Manager when notified to do so by the Owner's Project Manager.
- 4.7.7** If the Contractor fails to correct defective or nonconforming Work as required by Article 4.7.4 or Article 4.7.5 or, if the Contractor fails to remove defective or nonconforming Work from the site, as required by Article 4.7.6, the Owner may elect to either correct such Work in accordance with Article 3.4 "OWNER'S RIGHT TO CARRY OUT THE WORK" or remove and store materials and equipment at the expense of the Contractor.
- 4.7.8** The Contractor shall bear the cost of making good all work of the Owner, separate contractors or others, destroyed or damaged by such correction or removal required under this Article, Article 13 "UNCOVERING AND CORRECTION OF WORK" or elsewhere in the Contract Documents.

4.8 TAXES

- 4.8.1** The Contractor shall pay all applicable Federal, State, and local taxes and duties for the Work or portions thereof provided by the Contractor that are legally enacted at the time the Contract is awarded, whether or not yet effective.

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Increases in the rates of such taxes and duties during performance of the Contract shall be the responsibility of the Contractor.

4.9 PERMITS, FEES AND NOTICES

4.9.1 The Contractor shall secure and pay for all permits, fees, licenses and inspections necessary for the proper execution and completion of the Work that are legally required at the time the proposals are received.

4.9.2 The Contractor shall give all notices and comply with all laws, ordinances, rules, regulations and lawful orders of any public authority bearing on the performance of the Work.

4.9.3 The Contractor shall have personnel on site that are qualified and have the proper certifications for Erosion and Sedimentation Control, Best Management Practice (BMP), and Storm Water Management (SWM), or any other Department of Environmental Quality (DEQ) certifications as required for any and all permits issued and/or required by the Work.

4.10 SUPERINTENDENT

4.10.1 The Contractor shall employ a competent Superintendent and necessary assistants who shall be in attendance at the Project site during the progress of the Work. The Superintendent shall be an authorized representative of the Contractor and all communications given to the Superintendent shall be as binding as if given to the Contractor.

4.10.2 The Superintendent shall be in attendance at the Project site not less than eight hours per day, five days per week, unless the job is closed down due to a general strike or conditions beyond the control of the Contractor or until termination of the Contract in accordance with the Contract Documents. It is understood that such Superintendent shall be approved in writing by the Owner and shall be the one who will continue in that capacity for the duration of the Project, unless the Superintendent ceases to be on the Contractor's payroll or his withdrawal is required or approved by the Owner. The Superintendent shall not be employed on any other project for or by the Contractor or any other entity during the course of the Work.

4.10.3 Such Superintendent shall be fluent in English and in such other languages as may be necessary to communicate effectively with all owner's representatives, employees and Subcontractors of the Contractor. This requirement may be satisfied by the on-site presence of a competent foreign language interpreter to English interpreter. Any costs associated with foreign language interpretation shall be borne by the Contractor.

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4.10.4 Any and all project documents, including but not limited to daily reports and logs, maintained by the Superintendent or the Contractor's employees or Subcontractors shall be in English. Any costs of foreign language translation shall be borne solely by the Contractor and shall not be a basis for any additional compensation or time extension from the Owner.

4.11 PROJECT SCHEDULES

4.11.1 The Schedule of Completion shall consist of the Contractor planning, scheduling, and constructing this project by using a Critical Path Method Project Schedule (CPM). The CPM shall be used for coordinating and monitoring all the Work specified in the Contract Documents including all activities of subcontractors, vendors, suppliers, utilities, and all other parties associated with the construction of the project. The CPM shall be based upon the entirety of the Contract Documents. All physical work and major procurement activities shall be included. The CPM shall be the Activity-On-Arrow type. The Contractor shall use either Primavera or SureTrak scheduling software.

The CPM utilized float: Float is defined as the amount of time between when an activity "can start" (the early start) and when an activity "must start" (the late start). Float is a shared commodity for the Owner and the Contractor and is not for the exclusive use or financial benefit of either party. Either party has the full use of the float until it is depleted.

4.11.2 Initial Critical Path Method Project Schedule (ICPM) shall consist of the following:

- a. Activity-On-Arrow Time Scale Diagram
- b. Total Float Computer sort
- c. Written Narrative (WN)
- d. Printed calendars. The printed calendars shall include a listing, description, and calendar form tabulation of all calendars used in the ICPM. The calendars shall contain the total number of anticipated work days required to complete all the Work required in the Contract. The calendars shall delineate the holidays, anticipated nonwork days, and bad weather days. An explanation of the Contractor's basis for determining nonwork and bad weather days shall be included with the calendars.
- e. Data disc containing all of the information for (a) thru (d). The format shall be compatible with the Owner's computer software.

The ICPM diagram shall be drafted to a scale that allows the I node and J node numbers of each activity to be printed adjacent to that activity. The activities shall be clearly defined. All restraints between activities shall be shown.

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The Contractor shall expend the entire Contract time specified in this Invitation for Bids. On Contracts with calendar date completions or calendar day durations, all planned activities shall have durations not exceeding 14 calendar days, except the activities required for the Owner's review and approval of the working drawings and material sources which shall be given a duration of not less than 30 calendar days. On Contracts with working day durations, these time periods shall be 10 working days and 25 working days.

All activities in the Contract Documents along with a written narrative explanation shall be identified in the ICPM. The Project Manager reserves the right to specify the number of activities, and to require at any time additional breakdown of the activities.

The Contractor shall provide a written narrative as part of the ICPM describing the original critical path, the sequence of work, number of shifts per day, number of hours per shift, composition and number of crews, and the equipment to be utilized on each activity. Subcontracting activities shall be listed and identified by activity number. Each activity shall be identified by physical location and phase of work. Abbreviations used in preparing the ICPM shall be explained in the written narrative.

The Contractor shall complete the proposed ICPM within 14 calendar days after receiving the Notice of Award and submit 5 sets to the Project Manager for review and approval. The Project Manager will review the Contractor's ICPM within 5 calendar days after the submittal. If required, the Project Manager will convene a Joint Review Conference at which time the Project Manager and Contractor may make corrections and adjustments to the proposed ICPM. If a revision is necessary due to the Project Manager's review or the Joint Review Conference, the proposed revisions shall be submitted, by the Contractor, within 7 calendar days after the initial review date to the Project Manager for another review. Revisions shall conform to the format used in the ICPM. The Project Manager will respond to the revised ICPM within seven calendar days after its receipt.

No construction work shall begin until the Project Manager has accepted the ICPM. Time charges shall begin no later than the on or before date of the Notice to Proceed. Any delay in starting work caused by the acceptance of the ICPM by the Project Manager will not be a basis for any monetary claim.

- 4.11.3** When the Project Manager notifies the Contractor that the ICPM has been accepted, that document will become the CPM of Record (CPMR). The Contractor shall be responsible for implementing and executing the Work specified in the Contract in strict conformance with the CPMR. The CPMR shall be the Contractor's work plan for completing the entire Contract as specified in the Contract Documents.

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Failure of the Contractor to adhere to the latest approved CPMR will be cause for the Owner to deny any and all requests for additional compensation or extensions of the Contract duration.

4.11.4 Revisions to the CPMR shall consist of one or more of the following:

- a. A change in duration of an activity.
- b. A change in the logic of the schedule.
- c. A change in the calendars.
- d. The deletion or addition of one or more activities.

The Contractor may submit a proposed revision to the CPMR at any time during the life of the Contract.

The Contractor shall submit a proposed revision to the CPMR whenever the activities differ from the accepted CPMR. Proposed revisions shall be submitted by the Contractor within 30-calendar days from the date on which the Contractor's activities deviated from the accepted CPMR. The revisions shall be submitted to the Project Manager in the same format used for the ICPM. The revisions shall include data from all CPMR Updates, which have been accepted by the Administration. The Written Narrative accompanying the revision shall describe the reason for the revisions, the critical path, and all logic and duration modifications to the CPMR. These shall include, but not be limited to, changes in the method or manner of the Work, changes in Specifications, extra work, addition or deletion of work, increased or decreased quantities, defective work and acceleration of the Work.

The Project Manager will review the CPMR and respond to the Contractor's proposed revision within 5 calendar days after its receipt. The Project Manager reserves the right to deny any proposed revision which adversely impacts the Owner, utilities, or other interested parties.

4.11.5 Any written request for an extension of time or change in incentive/disincentive date (if applicable) shall be accompanied by a revised CPMR, which documents the actual delay to the Contract completion date or incentive/disincentive date. The request shall include a written narrative of the events which would require an extension of the Contract time or incentive/disincentive date.

Only delays to activities, which affect the Contract completion date or incentive/disincentive date will be considered for a time extension. The extension of the specified Contract completion date or incentive/disincentive date will be based upon the actual number of calendar days the Contract completion date or incentive/disincentive date is adjusted. No extensions of the specified Contract completion date will be issued for work performed on activities with float.

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- 4.11.6 Monthly updates of the CPMR are required.** CPMR update submissions shall contain the activity data as specified in (a) thru (e) of the ICPM. The update shall describe the progress of the project to date. It shall include a description of the current critical path, the amount of float on the critical path, any delays or disruptions experienced by the Contractor during the period of the update, any change in manpower or equipment, the inclusion of any schedule revisions, and any potential delays or disruptions.

When a delay or a disruption to the Work is identified in the Written Narrative, which the Contractor believes to be the responsibility of the Owner, the Contractor shall submit a revision to the CPMR within 30 calendar days after the submittal of the updates.

- 4.11.7** The Owner and the Contractor will hold monthly job site progress meetings to discuss the progress of the project and update the CPMR. The Contractor shall arrange to have a representative of each subcontractor currently working on the project in attendance. The Contractor shall submit to the Project Manager the CPMR updates within 14 calendar days from the date of the monthly meeting. The Project Manager will review the update and advise the Contractor of its acceptability prior to the next monthly meeting.

4.12 RESPONSIBILITY FOR COMPLETION

- 4.12.1** The Contractor shall furnish such labor, materials, tools, equipment, and professional services and shall work such hours, including night shifts, overtime operations and Sundays and holidays, as may be necessary to ensure the performance of the Work within Milestone and Completion dates specified in the Owner/Contractor Agreement. If it becomes apparent to the Owner's Project Manager that the Work will not be completed within required Milestone or Completion dates, the Contractor agrees to undertake some or all of the following actions, at no additional cost to the Owner, in order to ensure, in the opinion of the Owner's Project Manager, that the Contractor will comply with all Milestone and Completion date requirements:

- .1 Increase labor, materials, tools, equipment and professional services;
- .2 Increase the number of working hours per shift, shifts per working day, working days per week, or any combination of the foregoing; and
- .3 Reschedule activities to achieve maximum practical concurrency of accomplishment of activities.

- 4.12.2** If the actions taken by the Contractor are not satisfactory, the Owner or the Owner's Project Manager may direct the Contractor to take any and all actions

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necessary to ensure completion within the required completion dates, without additional cost to the Owner. In such event, the Contractor shall continue to assume responsibility for his performance and for completion within the required dates.

4.12.3 If, in the opinion of the Project Manager, the actions taken by the Contractor pursuant to this Agreement or the progress or sequence of work are not accurately reflected on the Construction schedule, the Contractor shall revise such schedule to accurately reflect the actual progress and sequence of work.

4.12.4 This provision does not eliminate the Contractor's responsibility to comply with the Town noise ordinances, all Town permit requirements and all other applicable laws, regulations, rules, ordinances, resolutions, and permit requirements.

4.13 DOCUMENTS, OTHER SUBMITTALS AT THE SITE; AS-BUILT DRAWINGS

4.13.1 The Contractor and his Subcontractors shall maintain at the site, and at all times make available to the Owner and the Owner's Project Manager one record copy of all Drawings, Specifications, Addenda, Change Orders, and other Modifications, in good order and marked currently to record all changes made during construction, and approved Shop Drawings, Product Data, Samples, Mock Ups and other Submittals ("as-built drawings").

4.13.2 The Contractor shall prepare the as-built drawings by marking up two sets of prints and one electronic copy of the applicable Contract Drawings to portray as-built construction, in conformance with the DCSM. The prints shall be neatly and clearly marked to show all variations between the Work actually provided and that indicated on the Contract Drawings, and all utilities encountered in the Work. All drafting shall conform to good drafting practice and shall include such supplementary notes, legends and details as may be necessary for legibility and clear portrayal of the as-built construction. These drawings shall be marked promptly at the completion of the project and shall be turned over the Owner prior to Final Payment.

4.14 SHOP DRAWINGS, PRODUCT DATA, SAMPLES AND OTHER SUBMITTALS

4.14.1 The term "Shop Drawings" shall mean all drawings, diagrams, illustrations, brochures, schedules and other data which are prepared by Contractor, a Subcontractor, manufacturer, supplier or distributor and which illustrate the equipment, material or some portion of the Work.

4.14.2 The Contractor shall submit with reasonable promptness and in such sequence as to cause no delay in the Work or in the work of the Owner or any separate

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Contractor, all Shop Drawings, Product Data, Manuals, Samples, and Submittals required by the Contract Documents. All such submissions shall be made so as to cause no delay in the project, allowing the Owner or his designated representative fourteen (14) working days for review and checking.

- 4.14.3** By approving and submitting Shop Drawings, Product Data, Manuals, Samples and Submittals, the Contractor represents that he has determined and verified all materials, field measurements, and field construction criteria related thereto, and that he has checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents. The Contractor shall adhere to any supplementary processing and scheduling instructions pertaining to any submittals that may be issued by the Owner's Project Manager.
- 4.14.4** Parts and details not fully indicated on the Contract Drawings shall be detailed by the Contractor in accordance with standard engineering practice. Dimensions on the Contract Drawings, as well as detailed drawings themselves, are subject in every case to measurements of existing, adjacent, incorporated and completed work that shall be taken by the Contractor before undertaking any work dependent on such data.
- 4.14.5** Where the Contract Documents call for the submittal of manufacturer's data to the Owner or the Owner's Project Manager for information only, such submittals shall be made before the commencement of any portion of the Work requiring such submission.
- 4.14.6** The Contractor shall not be relieved of responsibility for any deviation from the requirements of the Contract Documents by virtue of the review by the Owner or the Owner's Project Manager of Shop Drawings, Product Data, Samples or Manuals unless the Contractor has specifically informed the Owner's Project Manager in writing of such deviation at the time of submission and the Owner's Project Manager has given written approval to the specific deviation. The Contractor shall not be relieved from responsibility for errors or omissions in the Shop Drawings, Product Data, Samples or Manuals by the Owner or Owner's Project Manager's review thereof.
- 4.14.7** Shop drawings shall be submitted in such number of copies that three copies may be retained by the Project Manager or his designee after approval. Each submission shall be accompanied by a letter of transmittal in duplicate, listing the contents of the submission and identifying each item by reference to specification section or drawing. All Shop Drawings shall be clearly labeled with the name of the project and such information as may be necessary to enable their complete review by the Project Manager or his designee. Catalog plates and other similar material that cannot be so labeled conveniently shall be bound in suitable covers bearing the identifying data.

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- 4.14.8** Shop drawings shall be accompanied by all required certifications and other such supporting material, and shall be submitted in such sequence or in such groups that all related items may be checked together. When Shop Drawings cannot be checked because a submission is not complete, or because Shop Drawings on related items have not been received by the Project Manager or his designee, such Shop Drawings will be returned without action, and marked 'rejected' with the reason for rejection clearly stated. Incomplete or defective submittals shall also be returned without action, and marked 'rejected' with the reason for rejection clearly stated.
- 4.14.9** Shop Drawings shall have been reviewed by the Contractor and coordinated with all other related or affected work before they are submitted for approval and shall bear the Contractor's certification that the Contractor has checked and approved them as complying with all relevant information in the Contract Documents. Shop Drawings submitted without such certification and coordination will be returned to the Contractor without action and will be considered not a formal submission.
- 4.14.10** SAMPLES required by the specifications or requested by the Project Manager or his designee shall be submitted for approval. Samples shall be submitted in single units only, unless the Contractor desires additional units for the Contractor's own use. Each sample shall bear a label indicating the material represented, the name of the producer and the title of the Project. Approval of a sample shall be only for conformance with the design concept of the Project and compliance with the information given in the Contract Documents, and only for the characteristics or use named in such approval. Such approval shall not be construed to change or modify any Contract requirements or the Contract Price. Materials and equipment incorporated in the Work shall match the approved samples.
- 4.14.11** All TESTS of materials and finished articles shall be made by bureaus, laboratories or agencies approved by the Project Manager or his designee, and the certified reports of such tests shall be submitted to the Project Manager. All costs in connection with the testing shall be borne by the Contractor. Failure of any material to pass the specified tests or any test performed by the Project Manager or his designee will be sufficient cause for refusal to consider, under this Contract, any further materials of the same brand or make of that material. Samples of various materials delivered on the site or in place may be taken by the Project Manager or his designee for testing. Samples failing to meet the requirements of the Contract Documents will automatically void previous approvals of the items tested. See Article 7.5 for additional test requirements.

Unless otherwise specified, testing for soil compaction, soil suitability, concrete testing, etc. will be performed by or on behalf of the Contractor at the

GENERAL CONDITIONS

Contractor's expense. The Contractor shall furnish copies of all test results or related reports or documents to the Project Manager.

4.15 CUTTING AND PATCHING OF WORK

4.15.1 The Contractor shall be responsible for all cutting, fitting or patching that may be required to complete the Work and to make its several parts fit properly and in accordance with the Contract Documents.

4.15.2 The Contractor shall not damage or endanger any portion of the Work or the work of the Owner or any separate Contractors by cutting, patching or otherwise altering any work, or by excavation. The Contractor shall not cut or otherwise alter the work of the Owner or any separate Contractor except with the written consent of the Owner and of such separate Contractor. The Contractor shall not unreasonably withhold from the Owner or any separate Contractor his consent to cutting or otherwise altering the Work. The Owner shall not be required to accept work with a cut, a splice, or patch when such cut, splice or patch is not generally accepted practice for the particular work involved or is otherwise unworkmanlike in the opinion of the Owner or the Owner's Project Manager.

4.16 DRUG-FREE WORKPLACE

During the performance of this contract, the Contractor agrees as follows:

- .1 The Contractor will provide a drug-free workplace for the Contractor's employees. The Contractor agrees to post in conspicuous places, available to employees and applicants for employment, a statement notifying employees that the unlawful manufacture, sale, distribution, dispensation, possession, or use of a controlled substance or marijuana is prohibited in the Contractor's workplace and specifying the actions that will be taken against employees for violations of such prohibition.
- .2 The Contractor shall state in all solicitations or advertisements for employees placed by or on behalf of the Contractor that the Contractor maintains a drug-free workplace.
- .3 The Contractor will include the provisions of the foregoing clauses in every subcontract or purchase order of over \$10,000, so that the provisions will be binding upon each Subcontractor or vendor.

For the purposes of this section, "drug-free workplace" means a site for the performance of work done in connection with a specific contract awarded to a Contractor in accordance with the VPPA Section 2.2-4312, the employees of

GENERAL CONDITIONS

whom are prohibited from engaging in the unlawful manufacture, sale, distribution, dispensation, possession or use of any controlled substance or marijuana during the performance of the contract.

4.17 NON-DISCRIMINATION IN EMPLOYMENT

During the performance of this Contract, the Contractor agrees to comply fully with VPPA § 2.2-4201 and § 2.2-4343.1 as follows:

- .1 The Contractor will not discriminate against any employee or applicant for employment because of race, religion, disability, color, sex or national origin, except where religion, sex or national origin is a bona fide occupational qualification reasonably necessary to the normal operation of the Contractor and the Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices setting forth the provisions of this nondiscrimination clause;
- .2 The Contractor, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, will state that such Contractor is an equal opportunity employer;
- .3 Notices, advertisements and solicitations placed in accordance with Federal law, rule or regulation, shall be deemed sufficient for the purpose of meeting the requirements of this provision; and
- .4 The Contractor will include the provisions of paragraphs .1, .2, .3 above in every subcontract or purchase order of over \$10,000 so that the provisions will be binding upon every Subcontractor or vendor.
- .5 The Contractor will comply with the requirements VPPA Section 2.2-4343.1, Permitted Contracts with Certain Religious Organizations, as applicable.

4.18 SIGNS

The Contractor may at his option and without cost to the Owner, erect signs acceptable to the Owner on the site of the Contract for the purpose of identifying and giving directions to the job. No signs shall be erected without prior approval of the Owner as to design and location.

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4.19 CLEANING UP

4.19.1 The Contractor at all times shall keep the project site and all surrounding public streets and neighboring property free from accumulation of waste materials or rubbish caused by his operations. At the completion of the Work and before Final Payment is made, he shall remove all his waste materials and rubbish from and about the Project as well as all his tools, equipment and surplus materials. The Contractor shall also thoroughly clean and leave reasonably dust free all interior of all buildings included in the Contract, and thoroughly clean all glass installed under the Contract including the removal of all paint and mortar splatters and other defacements.

4.19.2 If the Contractor fails to clean up during or at the completion of the Work, the Owner may do so as provided in Article 6.3 "OWNER'S RIGHT TO PERFORM DISPUTED WORK" and the cost thereof shall be charged to the Contractor.

4.19.3 The Contractor shall take all reasonable steps, including but not limited to providing a wash down area, to prevent mud, dirt, and other material from accumulating upon the public streets.

4.19.4 During and at the completion of the Work, the Contractor shall prevent site soil erosion, the runoff of silt or debris carrying water from the site, and the blowing of debris off the site in accordance with the applicable requirements and standards of the Virginia Erosion and Sediment Control Handbook, latest edition, and the Contract Documents.

4.20 ROYALTIES AND PATENTS

4.20.1 Contractor shall pay all license fees and royalties and assume all costs incident to the use in the performance of the Work of any invention, design, process, product or device which is the subject of patent rights or copyrights held by others. If a particular invention, design, process, product or device is specified in the Contract Documents for use in the performance of the Work and if to the actual knowledge of the Owner or Owner's Project Manager its use is subject to patent rights or copyrights calling for the payment of any license fee or royalty to others, the existence of such rights shall be disclosed by Owner in the Contract Documents. Contractor shall indemnify, defend and hold harmless Owner and Owner's Project Manager and anyone directly or indirectly employed by either of them from and against all claims, damages, losses and expenses (including attorneys' fees) arising out of any infringement of patent rights or copyrights incident to the use in the performance of the Work of any invention, design, process, product or device not specified in the Contract Documents, and shall defend all such claims in connection with any alleged infringement of such rights.

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4.21 ANTITRUST

By entering into a contract Contractor conveys sells assigns and transfers to the Owner all rights, title and interest in and to all causes of the action it now may have or hereafter acquire under the antitrust laws of the United States and the Commonwealth of Virginia, relating to the particular good(s) or service(s) purchased or acquired by the Owner under this contract.

4.22 INDEMNIFICATION

4.22.1 To the fullest extent permitted by law, the Contractor shall, at his sole cost and expense, indemnify, defend, and hold harmless the Owner, the Owner's Project Manager, their agents, representatives, employees, successors and assigns from and against all claims, actions, judgments, costs, liabilities, penalties, damages, losses and expenses, including but not limited to, attorneys' fees, arising out of or resulting from the performance of the Work, provided that any such claim, action, judgment, cost, liability, penalty, damage, loss or expense:

- .1 Is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself) including loss of use resulting therefrom; and
- .2 Is caused in whole or in part by any negligent act or omission of the Contractor, any Subcontractor or supplier, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, regardless of whether or not it is caused in part by a party indemnified hereunder.

The Contractor shall not be obligated to indemnify the Owner or the Owner's Project Manager hereunder for any damages or injuries, including death, the proximate cause of which is the sole negligence of the Owner or the Owner's Project Manager, consistent with Va. Code § 11-4.1.

Such obligation shall not be construed to negate, abridge, or otherwise reduce any other right or obligation of indemnity that would otherwise exist as to any party or person described in this Article 4.22

4.22.2 In any and all claims against the Owner and the Owner's Project Manager or any of their agents, representatives, or employees by any employee of the Contractor, any Subcontractor, anyone directly or indirectly employed by any of them, or anyone for whose acts any of them may be liable, the indemnification obligation under this Article 4.22 shall not be limited in any way by any limitation on the amount or type of damages, compensation or benefits payable by or for the Contractor or any Subcontractor under workers' compensation acts, disability benefit acts or other employee benefit acts.

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4.22.3 No provision of Article 4.22 shall give rise to any duties on the part of the Owner or the Owner's Project Manager, or any of their agents, representatives or employees.

4.22.4 The obligations of the Contractor under Article 4.22 shall not extend to the liability of the Owner's Project Manager, or the Owner's design architect or engineers, their agents or employees arising out of (a) the preparation or approval of maps, drawings, opinions, reports, surveys, Change Orders, designs or specifications, or (b) the giving of or the failure to give directions or instructions by Owner's Project Manager, his agents or employees provided such giving or failure to give is the primary cause of injury or damage.

4.23 PERSONS AUTHORIZED TO SIGN DOCUMENTS

The Contractor, within five days after the earlier of the date of a Notice to Proceed or the date of the Owner/Contractor Agreement shall file with the Owner's Project Manager a list of all persons who are authorized to sign documents such as contracts, certificates and affidavits on behalf of the Contractor and to fully bind the Contractor to all the conditions and provisions of such documents.

4.24 ASBESTOS AND OTHER HAZARDOUS SUBSTANCES

4.24.1 Whenever and wherever during the course of performing any work under this contract, the Contractor discovers the presence of asbestos or other hazardous substances or suspects the presence of any hazardous substances, he shall stop the work immediately, secure the area, notify the Owner and await positive identification of the suspect material. During the downtime in such a case, the Contractor shall not disturb any surrounding surfaces but shall protect the area with suitable dust covers. In the event the Contractor is delayed due to the discovery of asbestos, suspected asbestos or any other hazardous or suspected hazardous substances, then a mutually agreed extension of time to perform the Work shall be allowed the Contractor.

4.24.2 Any claims for extension of time shall be subject to the provisions of Article 8.

4.24.3 If the items/products to be purchased are "Hazardous Substances" as defined by 15 U.S.C. § 1261, then the Contractor certifies and warrants that the items or products to be delivered under the Contract shall be properly labeled as required by the foregoing sections and that by delivering the items/products, the Bidder does not violate any of the prohibitions of 15 U.S.C. § 1263.

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4.24.4 Material Safety Data Sheets (MSDS) and descriptive literature shall be provided with the submittal or delivery of each chemical and/or compound subject to Article 4.24.3. Failure on the part of the Contractor to submit such data may be cause for termination in accordance with Article 14.3.

4.25 RIGHT TO PUBLISH

The Contractor otherwise agrees that he will not publish, cause to be published, or otherwise disseminate any information of any nature relating to the Work performed under this Contract, except as may be approved by the Owner in writing.

4.26 MATERIALS AND EQUIPMENT LIST

4.26.1 At least ten (10) working days before the start of construction the Contractor shall submit to the Project Manager for approval a complete list of materials and equipment proposed for use in connection with the project. Partial lists submitted from time to time will not be considered.

4.26.2 After any material or piece of equipment has been approved, no change in brand or make will be permitted unless satisfactory written evidence is presented to prove that the manufacturer cannot make scheduled delivery of the approved material, or that material delivered has been rejected and the substitution of a suitable material is an urgent necessity, or that other conditions have become apparent which indicate that approval of such other material is in the best interest of the Owner.

END OF ARTICLE 4

GENERAL CONDITIONS

ARTICLE 5: SUBCONTRACTORS

5.1 DEFINITIONS

5.1.1 A Subcontractor is any firm, supplier, distributor or vendor that performs work for or furnishes services, equipment or supplies to or for the Contractor or another Subcontractor in conjunction with the Contract. The term Subcontractor is referred to throughout the Contract Documents as if singular in number and masculine in gender and means a Subcontractor or his authorized representative. Although the term Sub-subcontractor may appear within the Contract Documents, the term Subcontractor includes any person or entity that has a direct or indirect contract with the Contractor to perform any of the Work.

5.1.2 The Contractor shall be fully responsible to the Owner for all acts and omissions of his Subcontractors, and of persons and organizations directly or indirectly employed by them, and of persons and organizations for whose acts any of them may be liable, to the same extent that he is responsible for the acts and omissions of persons directly employed by him.

5.1.3 Nothing contained in the Contract Documents is intended to, nor shall it create, any contractual relationship between the Owner, the Owner's Project Manager, or any of their agents, consultants, employees, independent contractors, or representatives and any Subcontractor, but the Owner shall be entitled to performance of all obligations intended for its benefit, and to enforcement thereof.

5.1.4 The Owner's Project Manager will not deal directly with any Subcontractor. Communication will be made only through the Contractor. Subcontractors shall route requests for information or clarification through the Contractor to the Owner's Project Manager.

5.2 AWARD OF SUBCONTRACTS AND OTHER CONTRACTS FOR PORTIONS OF THE WORK

5.2.1 The Contractor shall within fourteen days after award of the Contract furnish to the Owner's Project Manager in writing the names of the persons or entities (including those who are to furnish materials or equipment fabricated to a special design) proposed for each of the principal portions of the Work. The Owner's Project Manager will promptly reply to the Contractor in writing stating whether the Owner has objection to any such proposed person or entity.

5.2.2 The Contractor shall not contract with any such proposed Subcontractor to whom the Owner has made objection under the provisions of Article 5.2.1. The Contractor shall not be required to contract with anyone to whom he has an objection.

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5.2.3 If the Owner objects to any proposed Subcontractor under Article 5.2.1, the Contractor shall name a substitute to whom the Owner has no objection within fifteen days.

5.2.4 The Contractor shall make no substitution for any Subcontractor previously proposed by the Contractor and not objected to by the Owner's Project Manager if the Owner makes objection to such substitution.

5.3 SUBCONTRACTUAL RELATIONS

5.3.1 By an appropriate agreement, written where legally required for validity, the Contractor shall require each Subcontractor, to the extent of the Work to be performed by the Subcontractor, to be bound to the Contractor by the terms of the Contract Documents, and to assume toward the Contractor all the obligations and responsibilities that the Contractor, by these Documents, assumes toward the Owner.

This agreement shall preserve and protect the rights of the Owner under the Contract Documents with respect to the Work to be performed by the Subcontractor. The subcontracting will not prejudice such rights, and shall allow to the Subcontractor, unless specifically provided otherwise in the Contractor-Subcontractor Agreements, the benefit of all rights, remedies and redress against the Contractor that the Contractor, by these Contract Documents, has against the Owner. Where appropriate, the Contractor shall require each Subcontractor to enter into similar agreements with his Subcontractors.

The Contractor shall make available to each proposed Subcontractor, prior to the execution of the Subcontract, copies of the Contract Documents to which the Subcontractor will be bound by this Article 5.3, and identify to the Subcontractor any terms and conditions of the proposed Subcontract that may be at variance with the Contract Documents. Each Subcontractor shall similarly make copies of such Contract Documents available to his Sub-subcontractors or Suppliers.

5.3.2 The Contractor shall be liable to and indemnify, defend and hold the Owner harmless from all costs, expenses, fees, attorney's fees, accountant's fees, damages and claims arising because of the Contractor's failure to comply with the provisions of this Article 5.3.

5.4 QUALIFICATION SUBMITTALS

5.4.1 Specific qualification submittals may be required of Subcontractors for certain critical items of the Work. Required qualification submittals are set forth in detail in the Contract Documents and shall be collected and submitted by the Contractor to the Owner's Project Manager for review and approval by the

GENERAL CONDITIONS

Owner and Owner's Project Manager. All information required of a single Subcontractor shall be contained in a single, complete submittal. The Contractor shall submit the required qualification information within ten days after receipt of the Owner's Project Manager's request.

5.4.2 The Owner may reject any proposed Subcontractor, or any qualification submittals related thereto, for the following reasons:

- .1 The Contractor's failure to submit requested information within the specified time; or
- .2 The Contractor's failure to provide all of the requested information; or
- .3 The Contractor's submission of a Subcontractor, or its qualifications, that are unacceptable to the Owner.

5.4.3 Should the Owner have objection to any proposed Subcontractor, the Contractor shall submit another firm for approval within fifteen days.

END OF ARTICLE 5

GENERAL CONDITIONS

ARTICLE 6: WORK BY OWNER OR BY SEPARATE CONTRACTORS

6.1 OWNER'S RIGHT TO PERFORM WORK AND TO AWARD SEPARATE CONTRACTS

6.1.1 The Owner reserves the right to perform work related to the Project with its own forces, and to award separate contracts in connection with other portions of the Project or other work on the site.

6.1.2 When separate contracts are awarded for different portions of the Project or other work on the site, the term Contractor in the Contract Documents in each case shall mean the Contractor who executes each separate Owner/Contractor Agreement.

6.2 MUTUAL RESPONSIBILITY

6.2.1 The Contractor shall afford other Contractors and the Owner reasonable opportunity for the introduction and storage of their materials and equipment and the execution of their work and shall properly connect and coordinate the Work with that of the Owner and other Contractors, to store his tools, materials and equipment in such orderly fashion at the site of the Work as will not unduly or unreasonably interfere with the progress of the Work or the work of any other Contractors.

6.2.2 If the execution or result of any part of the Work depends upon any work of the Owner or of any separate Contractor, the Contractor shall, prior to proceeding with the Work, inspect and promptly report in writing to the Owner's Project Manager any apparent discrepancies or defects in such work of the Owner or of any separate Contractor that render it unsuitable for such proper execution or result of any part of the Work under this Contract.

6.2.3 Failure of the Contractor to so inspect and report shall constitute an acceptance of the Owner or separate Contractor's work as fit and proper to receive the Work, except as to defects that may develop in the Owner's or separate Contractor's work after completion of the Work, and that the Contractor could not have discovered by its inspection prior to completion of the Work under this Contract.

6.2.4 Should the Contractor cause damage to the Work or property of the Owner or of any separate Contractor on the Project, or to other work on the site, or delay or interfere with the Owner's work on ongoing operations or facilities or adjacent facilities of the Contractor's work, the Contractor shall be liable for the same and, in the case of another Contractor, the Contractor shall attempt to settle such claim with such Contractor prior to such other Contractor's institution of litigation.

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6.3 OWNER'S RIGHT TO PERFORM DISPUTED WORK

6.3.1 If a dispute arises between the Contractor and separate Contractors as to their responsibility for cleaning up as required by Article 4.19 "CLEANING UP" or for accomplishing coordination as required by Article 6.4 "COORDINATION OF THE WORK," the Owner may carry out such Work and charge the cost thereof to the Contractors responsible therefor as the Owner's Project Manager shall determine.

6.4 COORDINATION OF THE WORK

6.4.1 By entering into this Contract, Contractor acknowledges that there may be separate Contractors on the Site whose work will be coordinated with that of his own. Contractor warrants and guarantees that he will cooperate with separate Contractors, and will do nothing to delay, hinder or interfere with the Work of other separate Contractors, the Owner or the Owner's Project Manager.

END OF ARTICLE 6

GENERAL CONDITIONS

ARTICLE 7: MISCELLANEOUS PROVISIONS

7.1 GOVERNING LAW

7.1.1 The Contract shall be governed by the law of the Commonwealth of Virginia, and shall be performed in accordance with the laws, ordinances, regulations, permits and resolutions of the Town of Leesburg. The sole venue for any litigation under this Contract shall be the Circuit Court of Loudoun County, Virginia. The conflicts of law provisions shall not be employed to apply the laws of any state other than those of the Commonwealth of Virginia to this Contract.

7.1.2 Each provision of law required to be inserted in this Contract shall be deemed inserted. If through mistake or otherwise, any provision is not properly inserted, the Contract shall be modified to include such provision upon the application of either party.

7.1.3 Where applicable, the Contractor shall meet or exceed all requirements of the Town of Leesburg Design and Construction Standards Manual and all other local, state and federal building codes.

7.2 SUCCESSORS AND ASSIGNS

7.2.1 The Contractor binds himself, his partners, successors, assigns and legal representatives to the Owner, its partners, successors, assigns and legal representatives in respect to all covenants, agreements and obligations contained in the Contract Documents. The Contractor shall not assign the Contract or sublet it as a whole without the written consent of the Owner, nor shall the Contractor assign any monies due or to become due to him under the Contract, without the previous written consent of the Owner and the Contractor's Surety. Nor shall any contract be entered into or assigned to any party that is debarred from doing business with or in the Commonwealth of Virginia.

7.2.2 In the event the Contractor desires to make an assignment of all or part of the contract or any monies due or to become due under this Contract, the Contractor shall file a written consent of Surety, together with a copy of the proposed Assignment with the Owner or the Owner's Project Manager. In the event the Contractor assigns all or any part of the monies due or to become due under this Contract, the instrument or assignment shall state that the right of assignees in and to any monies due to or to become due to the Contractor shall be subject to prior liens and claims of all persons, firms and corporations that provided labor, services, or furnished material and equipment during the performance of the Work. The rights of assignees shall further be subject to the payment of any liens, claims or amounts due to Federal or State governments, and to all rights of retention and set-off granted to the Owner by the Contract Documents.

GENERAL CONDITIONS

7.3 CLAIMS FOR DAMAGES

7.3.1 Should the Contractor suffer injury or damage to person or property because of any act or omission of the Owner or of any of its employees, agents or others for whose acts either is legally liable, claim shall be made in writing to the Owner within thirty days after the first observance of such injury or damage; otherwise, the Contractor shall have waived any and all rights he may have against the Owner, or its employees, representatives and agents.

7.4 DISPUTES

7.4.1 A claim, if any, shall be made in writing and submitted by the Contractor to the Owner, the Project Manager and the Leesburg Town Attorney within ten calendar days after the occurrence of events giving rise to the claim. A claim is limited to events rising out of or relating to the Contract. Failure to file a written claim as required herein shall constitute an absolute waiver of any claim of any sort.

7.4.2 The parties shall first endeavor to resolve any disputes, claims or other matters in question between them through direct negotiations, and if such direct negotiations fail, by non-binding mediation, with the site of the mediation being the Town of Leesburg, Virginia.

7.4.3 If the procedures of subparagraph 7.4.2 have been followed, but more than 90 days have passed since a party has requested mediation, and the dispute, claim or matter in question remains unresolved, then either party may institute a lawsuit in the Circuit Court of Loudoun County, Virginia, which is agreed to be the sole and exclusive venue, and may pursue all available appeals in Virginia state courts, to the extent they have jurisdiction.

7.4.4 Nothing in paragraphs 7.4.1 or 7.4.2 shall prevent a party from seeking temporary injunctive or other temporary equitable relief in the Loudoun County Circuit Court if circumstances so warrant.

7.4.5 In the event of any dispute, claim, or other matter in question arising, Contractor shall continue its performance diligently during its pendency as if no dispute, claim or other matter in question had arisen. During the pendency of any dispute in connection with the payment of moneys, Contractor shall be entitled to receive payments for non-disputed items.

7.4.6 Notwithstanding any other provision hereof, the Contractor expressly waives all claims against the Owner for consequential damages arising out of or relating to this Contract. This waiver includes losses of financing, business and reputation, bonding capacity, and loss of profit other than profit arising directly from the Work where otherwise permitted in the Contract.

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7.5 TESTS

7.5.1 If the Contract Documents, laws, ordinances, rules, regulations or orders of any public authority having jurisdiction require any portion of the Work to be inspected, tested, or approved, the Contractor shall give the Owner's Project Manager five days notice of its readiness so the Owner's Project Manager may observe such inspection, testing, or approval. The Contractor shall bear all costs of such inspections, tests or approvals conducted by public authorities.

7.5.2 If the Owner's Project Manager determines that any Work requires special inspection, testing, or approval that Article 7.5.1 does not include, the Owner's Project Manager will order the Contractor to make arrangements for such special inspection, testing or approval, and the Contractor shall give the Owner's Project Manager five days notice of such inspection. If such special inspection or testing reveals a failure of the Work to comply with:

- .1 The requirements of the Contract Documents, or
- .2 The conformance of the Work with laws, ordinances, rules, regulations, or orders of any public authority having jurisdiction.

The Contractor shall bear all costs of the Work, including compensation for the Owner's Project Manager and any additional services made necessary by such failure.

7.5.3 Inspections and tests required under Article 7.5.2 to establish compliance with the Contract Documents will be made by a testing agency employed by the Owner. If the initial tests indicate non-compliance with the Contract Documents, the Contractor shall bear the costs thereof and any subsequent testing occasioned by non-compliance shall be performed by the same agency and the cost thereof shall be borne by the Contractor. Representatives of the testing agency shall have access to the Work at all times. The Contractor shall provide facilities for such access in order that the agency may properly perform its functions.

7.5.4 Certificates of inspection, testing or approval required by public authorities shall be secured by the Contractor and promptly delivered by him to the Owner's Project Manager, in adequate time to avoid delays in the Work or Final Payment.

7.5.5 The Contractor shall pay for and have sole responsibility for inspection or testing performed exclusively for his own convenience and for tests necessary because of Contractor's or Subcontractor's errors, omission, or noncompliance with Contract Documents.

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7.5.6 All materials and workmanship (if not otherwise designated by the specifications) shall be subject to inspection, examination and test by the Owner or the Owner's Project Manager, at any time during the manufacture or construction and at any place where such manufacture or construction are carried on. Special, full-sized and performance tests shall be described in the specifications. Without additional charge, the Contractor shall furnish promptly all reasonable facilities, labor and materials necessary to make tests safe and convenient.

7.5.7 It is specifically understood and agreed that an inspection and approval of the materials or work by the Owner or the Owner's Project Manager shall not in any way subject the Owner to pay for the said materials or work or any portion thereof, even though incorporated in the Work, if said materials or work shall in fact turn out to be not in compliance with the Contract Documents or otherwise defective.

7.6 UNENFORCEABILITY OF ANY PROVISION

7.6.1 If any provision of this Contract is held as a matter of law to be unenforceable or unconscionable, the remainder of the Contract shall be enforceable without such provision.

7.7 AVAILABILITY OF LANDS

7.7.1 Owner shall furnish, as indicated in the Contract Documents, the lands upon which the Work is to be done, rights-of-way or easements for access thereto. The Owner reserves the right to delay the notice to proceed with the Contract Work in order to secure rights of way, easements or to relocate utilities, such as sewer, water, gas, electricity, cable television and other services.

7.7.2 If the Contractor requires additional land for temporary construction facilities and for storage of materials and equipment other than the areas available on the site or right-of-way, or as otherwise furnished by the Owner, the Contractor shall provide such other lands and access thereto entirely at the Contractor's own expense and without liability to the Owner. The Contractor shall not enter upon private property for any purpose without written permission. The contractor shall provide to the Owner evidence of written permission for entry onto private property for the purpose of temporary construction facilities and/or storage of materials and equipment.

7.8 NONEXCLUSIVITY OF REMEDIES

All remedies available to the Owner under the Contract are cumulative and no such remedy shall be exclusive of any other remedy available to the Owner.

END OF ARTICLE 7

GENERAL CONDITIONS

ARTICLE 8: TIME

8.1 DEFINITIONS

8.1.1 The Contract Time is the period set forth in the Owner/Contractor Agreement for Final Completion of the Work as defined in Article 8.1.4, including authorized extensions thereto.

8.1.2 The date of commencement of the Work is the date established in the Notice to Proceed issued by the Owner.

Submission by the Contractor of all Certificates of Insurance, Performance and Payment Bonds and their approval by the Owner are conditions precedent to the issuance of the Notice to Proceed. Availability of lands under Article 7.7 is also a condition precedent to the issuance of the Notice to Proceed. The Contractor shall not commence the Work or store materials or equipment on site until written Notice to Proceed is issued or until the Contractor otherwise receives the written consent of the Owner.

8.1.3 The date of Substantial Completion of the Work or designated portion thereof is the date certified by the Owner's Project Manager that the Work or a designated portion thereof is sufficiently complete, in accordance with the Contract Documents, so the Owner can fully occupy or utilize the Work or designated portion thereof for the use for which it is intended, with all of the Project's parts and systems operable as required by the Contract Documents. Only punch list work and any final cleaning beyond that needed for the Owner's full use may remain for Final Completion.

8.1.4 The date of Final Completion of the Work is the date certified by the Owner's Project Manager when the Work is complete, to include punch list work and final clean up, in accordance with the Contract Documents and the Owner may fully occupy or fully utilize the Work for the use for which it is intended.

8.1.5 If the date or time of completion is included in the Contract, it shall be the Date of Final Completion as defined in Article 8.1.4, including authorized extensions thereto, unless otherwise provided.

8.1.6 The term Day as used in the Contract Documents shall mean calendar day unless otherwise specifically designated. All dates shall mean midnight of the indicated day unless otherwise stipulated.

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8.2 PROGRESS AND COMPLETION

8.2.1 All time limits stated in the Contract Documents are of the essence of this Contract.

8.2.2 The Contractor shall prosecute the Work diligently to Final Completion.

8.3 DELAYS AND EXTENSIONS OF TIME

8.3.1 The time during which the Contractor is delayed in the performance of the Work, by the acts or omissions of the Owner, the Owner's Project Manager or their employees or agents, acts of God, unusually severe and abnormal climatic conditions, fires, floods, epidemics, quarantine restrictions, strikes (not to exceed the actual duration of the strike), riots, terrorism, civil commotions, war or freight embargoes, or other conditions beyond the Contractor's control and that the Contractor could not reasonably have foreseen and provided against, shall be added to the Contract Time; provided, however, that no claim by the Contractor for an extension of time for delays will be considered unless made in compliance with the requirements of this Article and other provisions of the Contract Documents.

8.3.2 The Contract Time shall be adjusted only for Change Orders pursuant to Article 12, "CHANGES IN THE WORK," Article 3.3, "OWNER'S RIGHT TO STOP OR SUSPEND THE WORK," and Article 8.3, "DELAYS AND EXTENSIONS OF TIME." If the Contractor requests an extension of the Contract Time, he shall furnish such justification and supporting evidence as the Owner's Project Manager may deem necessary for a determination of whether the Contractor is entitled to an extension of time under the provisions of the Contract.

8.3.3 The burden of proof to substantiate a claim for an extension of the Contract Time shall rest with the Contractor, including evidence that the cause was beyond his control. The Owner's Project Manager shall base his findings of fact and decision on such justification and supporting evidence and shall advise the Contractor in writing thereof.

8.3.4 The Contractor shall not be entitled to and hereby expressly waives any extension of time resulting from any condition or cause unless the request for an extension of time is made in writing to the Owner's Project Manager within seven days of the first instance of delay.

8.3.5 Any claim for an extension of time for a delay for any cause shall be made by filing a written notice of claim with the Owner and the Owner's Project Manager at the beginning of the occurrence or within seven days thereafter if the resulting delay was not reasonably foreseeable. If the asserted cause of delay is weather,

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such notice shall be given within seven days after asserted commencement of the claim delayed. The notice of claim shall state the circumstances of the occurrence, the justification for the delay and for the extension of time, and the estimated duration of the delay and of the extension requested. The claim for an extension of time for weather delays shall be further substantiated by weather data collected during the period of delay at the construction site. Said data must demonstrate that an actual departure from normal weather occurred at the work site during the dates in question. Within seven days after the cause of delay has been remedied, the Contractor shall give written notice to the Owner and the Owner's Project Manager of the actual time extension requested as a result of the claimed delay. Failure to file either of the notices as required herein shall constitute an absolute waiver of any claims resulting from a delay or any sort.

The anticipated adverse weather days per month are shown in the chart below.

<u>Jan</u>	<u>Feb</u>	<u>Mar</u>	<u>Apr</u>	<u>May</u>	<u>June</u>	<u>July</u>	<u>Aug</u>	<u>Sept</u>	<u>Oct</u>	<u>Nov</u>	<u>Dec</u>
8	7	7	8	8	7	5	6	4	6	5	5

The above chart will constitute the base line for monthly weather time evaluations. Actual adverse weather days will be recorded on a calendar day basis (including holidays and weekends), and compared to the anticipated monthly adverse monthly days based on the above chart. The number of actual adverse weather days shall be calculated chronologically from the first day to the last day in each month.

- 8.3.6** Any extension of time beyond the date of completion fixed by the Contract shall not be effective unless granted in writing, signed by the Owner.
- 8.3.7** The Contractor shall be entitled to an extension of time for delay which in the opinion of the Owner is entirely beyond the expectation and control of the Contractor by suspension of work pursuant to Article 3, or by strikes, lockouts, fire, insurrection, war, lightning, hurricane, and tornado. The Contractor shall be entitled to an extension of time for such causes only for the number of days of delay that the Owner may determine to be due solely to such causes and only to the extent that such occurrences actually delay the completion of the Project. Any request for extension of time shall be accompanied by detailed documentation of which specific schedule activities were affected, when they were affected and for what duration.
- 8.3.8** No extension of time will be granted to the Contractor for delays occurring to parts of the Work that have no measurable impact on the competition of the total Work under this Contract; nor will extension of time be granted for delays to

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parts of the Work that are not located on the Critical Path as reflected on the approved construction schedule at the time of such delay.

- 8.3.9** Delays in the delivery of equipment or material purchased by the Contractor or his Subcontractors (including Owner-selected equipment), or in the submission of required drawings or specifications by the Contractor's or its Subcontractor's materialmen, manufacturers or dealers, or in the performance of any of the Contractor's Subcontractors or caused by the performance of any of the Contractor's Subcontractors, shall not be considered as a just cause for delay. The Contractor shall be fully responsible for the timely submission, ordering, scheduling, expediting, delivery and installation of all equipment, materials and drawings.
- 8.3.10** Within sixty days after the Contractor files the notice of the actual duration of the extension of time as required herein, the Owner's Project Manager shall present his written opinion to the Owner as to whether an extension of time is justified, and, if so, his recommendation as to the number of days for time extension. The Owner will make the final decision on all requests for extension of time. The Owner's written decision shall be presented to the Contractor within thirty days from receipt of the Owner's Project Manager's recommendation. All such decisions made by the Owner shall be binding and conclusive upon the Contractor.
- 8.3.11** With respect to suspensions of work under Article 3, the Contractor may be entitled to an extension of time if the claim for such extension is submitted in accordance with the requirements of this Article, and if the suspension is not due to any act or omission of the Contractor, any Subcontractor or Sub-subcontractor or any other person or organization for whose acts or omission the Contractor may be liable.
- 8.3.12** An extension of time shall be the sole remedy under this Contract for any reasonable delay caused by any reason or occurrence. The Contractor acknowledges such extension of time to be its sole remedy hereunder, and agrees to make no claim for monetary damages of any sort for delay in the performance of this Contract occasioned by or in any way related to or arising from any act or omission to act of the Owner or the Owner's Project Manager or any representatives of the Owner or any representatives of the Owner's Project Manager, or because of any injunction which may be brought against the Owner or the Owner's Project Manager.
- 8.3.13** As a condition precedent to such additional compensation for unreasonable delay, the Contractor shall satisfy all notice and submission requirements set forth in the Contract Documents for approval of any extension of Contract Time or any change in the Contract Price.

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8.3.14 If the Contractor asserts an unwarranted claim for additional compensation for unreasonable delay, the Contractor shall be liable to the Owner and shall pay the Owner all costs incurred by the Owner in investigating, analyzing, negotiating, and litigating the claim.

8.3.15 This Article shall be construed to be included where applicable in every portion of the Contract Documents regardless of whether or not it is specifically referenced therein.

END OF ARTICLE 8

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ARTICLE 9: PAYMENTS AND COMPLETION

9.1 CONTRACT PRICE

9.1.1 Unless all or a part of the Contract is based on unit prices, the Contract Price is stated in the Contract and, including authorized adjustments thereto, is the firm, fixed price amount payable by the Owner to the Contractor for the performance of the Work under the Contract Documents. The Contract Price includes, but is not limited to, the Contractor's profits and general overhead and all costs and expenses of any nature whatsoever (including without limitation taxes, labor and materials), foreseen or unforeseen, and any increases in said costs and expenses, foreseen and unforeseen, incurred by the Contractor on this project. The Contractor agrees to assume all increases in costs of any nature whatsoever that may develop during the performance of the Work. The Contract Price includes all applicable Federal, State and local taxes and duties.

9.2 SCHEDULE OF VALUES

9.2.1 Within ten days after the Notice to Proceed is issued, the Contractor shall submit to the Owner's Project Manager a Schedule of Values, allocated to the various portions of the Work including mobilization and demobilization. This schedule, supported by data from the approved Progress Schedule, shall be used as a basis for the Contractor's Applications for Payment upon approval by the Owner's Project Manager. The Schedule of Values shall not alter in any way the firm, fixed price or lump sum contract price. The Contractor shall not front-end load or otherwise assign disproportionate amounts to the Schedule of Values.

9.2.2 If at any time the Contractor expects to receive an amount for a monthly progress payment larger than that indicated by the Schedule of Values and the approved Construction Schedule, the Contractor shall notify the Owner at least thirty days in advance of that payment so that the necessary allocation of funds can be processed. If the Contractor fails to give such notice, the Owner may defer such excess payment to the following progress payment.

9.2.3 With respect to any portion of the Contract subject to unit prices, the schedule of unit prices in the accepted bid shall be used as the basis for preparing Applications for Payment, and each partial payment shall represent the total value of all units of work completed, computed at the unit prices stated in the Contract, less the aggregate of previous payments and retainage. Final payment will be based on the actual quantities performed and justified on as-built drawings.

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9.3 APPLICATIONS FOR PAYMENT

- 9.3.1** The Owner shall make progress payments monthly as the Work proceeds on Applications for Payment approved by the Owner's Project Manager.
- 9.3.2** Prior to the date for each progress payment established in the Contract, the Contractor, in accordance with any Supplementary Conditions concerning schedules or payments, shall submit to the Owner's Project Manager an itemized Application for Payment, supported by such data substantiating the Contractor's right to payment as the Owner's Project Manager may require, including but not limited to the Contractor's certification that all work for which payment is requested has been completed in full accordance with the Contract Documents, copies of requisitions from Subcontractors and reflecting retainage, if any, as provided elsewhere in the Contract Documents. The Contractor shall certify that he has paid all due and payable amounts for which previous Certificates for Payment were issued and payments received from the Owner.
- 9.3.3** The Owner will retain five percent of the amount of all progress payments until the Work is substantially completed and accepted, whether or not the Owner has occupied any or all of the Project before such time.
- 9.3.4** The Contractor warrants that title to all Work, materials and equipment covered by an Application for Payment will pass to the Owner either by incorporation in the construction or upon the receipt of payment by the Contractor, whichever occurs first, free and clear of all liens, claims, security interests or encumbrances, hereinafter referred to in this Article 9 as "LIENS". The Contractor further warrants that no Work, materials or equipment covered by an Application for Payment will have been acquired by the Contractor, or by any other person performing Work at the site or furnishing materials and equipment for the Project, subject to an agreement under which an interest therein or an encumbrance thereon is retained by the seller or otherwise imposed by the Contractor or such other person.
- 9.3.5** Unless otherwise provided in the specifications the Owner will make partial payments to the Contractor on the basis of a duly certified and approved estimate of the Work performed during the preceding calendar month as certified by the Owner's Project Manager.
- 9.3.6** The Contractor may, in preparing estimates, take into consideration the material delivered on site and preparatory work done, if properly documented as required by this Contract, or as may be required by the Owner or the Owner's Project Manager so that the quantities may be verified.
- 9.3.7** The Contractor may, in preparing estimates, take into consideration material such as large pieces of equipment and items purchased specifically for the project, but

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stored off the site within the Commonwealth of Virginia, and these items may be considered for payment at the sole discretion of the Owner, provided that all of the following are accomplished prior to the submission of the monthly payment request in which payment for such materials is requested:

- .1 The Contractor must notify the Owner in writing at least ten days prior to the submission of the payment request, through the Owner's Project Manager, that specific items will be stored off site in a designated secure place within the Commonwealth of Virginia. The Schedule of Values must be detailed to separately indicate both the value of the material and of the labor/installation for trades requesting payment for stored materials. The Contractor warrants by giving such notification and by requesting payment for material stored off-site that the storage location is safe and suitable for the type of material stored and agrees that loss of such material shall not relieve him of the obligation to furnish these types and quantities of materials for the project and on a schedule to meet the time completion requirements of the Contract, subject to Article 8.
- .2 Such notification, as well as the payment request, shall:
 - a. itemize the quantity of such materials, and document with invoices the cost of said materials;
 - b. indicate the identification markings used on the materials. Such markings shall clearly reference the materials to the Project;
 - c. State the specific location of the materials. The location must be within reasonable proximity to the job site within the Commonwealth of Virginia;
 - d. State that the Surety on the Performance Bond and the Labor and Material Payment Bond has been notified of the request for payment of materials stored off the site and is agreeable to such payment;
 - e. Certify that adequate all-risk insurance has been obtained by the Contractor on the materials. Such insurance shall be in the name of the Owner and the Contractor.
- .3 The Owner's Project Manager shall indicate, in writing, to the Owner that submittals for such materials have been reviewed and meet the requirements of the drawings and specifications of the

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Contract documents, that the stored materials meet the requirement of the drawings and specifications, and that such material conforms to the approved submittals.

- .4 The Owner, through the Owner's Project Manager, shall notify the Contractor in writing of his agreement to prepayment for materials.
- .5 The Contractor shall notify the Owner in writing, through the Owner's Project Manager, when the materials are to be transferred to the site and when the materials are received at the site.
- .6 No partial payment shall be made until the appropriate Certificates of Insurance have been provided.
- .7 All material and Work for which partial payments are made shall thereupon become the sole property of the Owner, but this provision shall not relieve the Contractor from the sole responsibility for all materials and Work, including those for which payment has been made, or the restoration of any damaged Work or as a waiver of the right of the Owner to require the fulfillment of all the terms of the Contract.

9.4 CERTIFICATES FOR PAYMENT

- 9.4.1** The Owner's Project Manager will within ten days after receipt of the Contractor's Application for Payment, either approve the Application for Payment for such amount as he determines is properly due, or notify the Contractor in writing of his reasons for not approving the Application for Payment as provided in Article 9.6 "PAYMENTS WITHHELD."
- 9.4.2** The submission and approval of the Progress Schedule and monthly updates thereof, as required by any Supplementary Conditions concerning Schedules, shall be part of the application upon which progress payment shall be made. The Contractor shall be entitled to progress payments only as determined from the currently Approved and Updated Progress Schedule.

9.5 PROGRESS PAYMENTS

- 9.5.1** After an Application for Payment has been approved by the Owner's Project Manager, the Owner shall make payment in the manner and within the time provided in the Contract Documents.

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9.5.2 In accordance with Title 2.2-4354, Va. Code. Ann., Contractor is obligated to take one of the two following actions within seven (7) days after receipt of amounts paid to the Contractor by the Owner for work performed by any Subcontractor under this Contract:

- .1 Pay the subcontractor for the proportionate share of the total payment received from the Owner attributable to the Work performed by the Subcontractor under this Contract; or
- .2. Notify the Owner 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 provide its social security numbers and if a proprietorship, partnership, or corporation, they must provide its federal employer identification number.

The Contractor is obligated to pay interest to Subcontractors on all amounts owed by the Contractor that remain unpaid after seven (7) days following receipt by the Contractor of payment from the Owner for Work performed by the Subcontractor under this Contract, except for amounts withheld as allowed in Article 9.5.2.2, above. It is herewith provided that interest shall accrue at the base rate on corporate loans (prime rate) at large United States money center commercial banks as reported daily in the publication entitled The Wall Street Journal.

The Contractor shall include in each of its subcontracts 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 the above provisions shall not be construed to be an obligation of the Owner. 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.

9.5.3 The Owner's Project Manager may, on request and at his discretion, furnish to any Subcontractor, if practicable, information regarding the percentages of completion or the amounts applied for by the Contractor, and the action taken thereon by the Owner's Project Manager on account of Work done by such Subcontractor.

9.5.4 The Owner has no obligation to pay or to see to the payment of any monies to any Subcontractor except as may otherwise be required by law.

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9.5.5 No Application for Payment, nor any progress payment, nor any partial or entire use or occupancy of the Project by the Owner, shall constitute an acceptance of any Work that is not in accordance with the Contract Documents.

9.5.6 In the event of disputes, payment shall be mailed on or before the Payment date for amounts and Work not in dispute, subject to any set-offs claimed by the Owner; except in instances where further appropriations are required by the Owner or where the issuance of further bonds is required, in which case, payment shall be made within thirty days after the effective date of such appropriation or within thirty days after receipt of bond proceeds by the Owner.

9.6 PAYMENTS WITHHELD

9.6.1 The Owner's Project Manager may decline to approve the Application for Payment or reduce payment or because of subsequently discovered evidence or subsequent observations, he may nullify the whole or any part of any Application for Payment previously approved to such extent as may be necessary in his opinion to protect the Owner from loss, because of:

- .1 Defective Work not remedied;
- .2 Third party claims filed, whether in court, in arbitration or otherwise, or reasonable evidence indicating probable filing of such claims;
- .3 Failure of the Contractor to make payments properly to Subcontractors;
- .4 Reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Price;
- .5 Damage to the Owner or to a separate contractor;
- .6 Reasonable evidence that the Work will not be completed within the Contract Time, or within any Contract Milestones as established in the Contract Documents;
- .7 Failure or refusal of the Contractor to carry out the Work in accordance with or to otherwise substantially or materially comply with the Contract Documents;
- .8 Failure or refusal of the Contractor to properly schedule and coordinate the Work, or to provide Progress Schedules, reports and updates; and

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.9 Failure or refusal of the Contractor to fully comply with the provisions of Article 4.13 "DOCUMENTS, OTHER SUBMITTALS AT THE SITE; AS-BUILT DRAWINGS."

9.6.2 When the above grounds in Article 9.6.1 are removed, payment shall be made for amounts withheld because of them.

9.7 SUBSTANTIAL COMPLETION

9.7.1 When the Contractor considers that the Work, or a designated portion thereof which is acceptable to the Owner's Project Manager, is substantially complete as defined in Article 8.1.3, the Contractor shall prepare for submission to the Owner's Project Manager a list of items that in his opinion are to be completed or corrected and shall request in writing that the Owner's Project Manager perform a Substantial Completion inspection. The Owner's Project Manager shall review the Contractor's list and will compile a punch list of items to be corrected and completed. The failure to include any items on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents. When the Owner's Project Manager on the basis of an inspection determines that the Work or designated portion thereof is substantially complete, he will then prepare a Certificate of Substantial Completion that will establish the Date of Substantial Completion, state the responsibilities of the Owner and the Contractor for security, maintenance, heat, utilities, damage to the Work, and insurance, and shall fix the time within which the Contractor shall complete the items listed.

The Certificate of Substantial Completion shall be issued to the Contractor for his written acceptance of the responsibilities assigned to him in such Certificate and returned to the Owner's Project Manager within five days after issuance

9.7.2 The Contractor shall have thirty days from the Date of Substantial Completion to complete all items on the punch list to the satisfaction of the Owner's Project Manager. The Owner's Project Manager shall have the option to correct any and all punch list items not completed by the Contractor within thirty days from the Date of Substantial Completion by utilizing his own forces, those of the Owner, or by a separate Contractor. The cost of such correction of remaining punch list items by the Owner or others shall be deducted from the Final Payment to the Contractor.

9.7.3 The issuance of the Certificate of Substantial Completion does not indicate final acceptance of the Project by the Owner, and the Contractor is not relieved of any responsibility for the Project except as specifically stated in the Certificate of Substantial Completion.

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9.7.4 Should the Owner's Project Manager determine that the Work or a designated portion thereof is not substantially complete, he shall provide the Contractor a written notice stating why the project or designated portion is not substantially complete. The Contractor shall expeditiously complete the Work and shall request in writing that the Owner's Project Manager perform a Substantial Completion reinspection and the costs, if any, associated with such reinspection shall be assessed to the Contractor.

9.8 FINAL COMPLETION AND FINAL PAYMENT

9.8.1 Upon receipt of the documentation required by Article 9.8.3, and of written notice that the Work is ready for final inspection and acceptance, the Owner's Project Manager will promptly make such inspection and, when he finds the Work acceptable under the Contract Documents and the Contract fully performed, he will issue a Certificate of Final Completion to the Contractor. Upon his receipt of the Final Completion Certificate, the Contractor may submit his Application for Final Payment to the Owner's Project Manager for his approval. Final Payment shall be made in full to the Contractor within thirty calendar days after the approval by the Owner's Project Manager of the Application for Final Payment provided that the requirements of Article 9 have been fulfilled, except for an amount agreed upon for any Work remaining uncompleted for which the Owner is entitled a credit under the Contract Documents.

9.8.2 Should the Owner's Project Manager determine that the Work or a designated portion thereof is not complete, he shall provide the Contractor a written notice stating why the Project or designated portion is not complete. The Contractor shall expeditiously complete the Work and shall request in writing that the Owner's Project Manager perform a Final Completion reinspection and the costs, if any, associated with such reinspection shall be assessed to the Contractor.

9.8.3 Neither the Final Payment nor the remaining retained percentage shall become due until the Work is free and clear of any and all Liens and the Contractor submits to the Owner's Project Manager:

- .1 An affidavit that all payrolls, bills for materials and equipment, and other indebtedness connected with the Work for which the Owner or its property might in any way be responsible, have been paid or otherwise satisfied;
- .2 Consent of surety to Final Payment, if necessary;
- .3 As-built drawings, operation and maintenance manuals and other project closeout submittals, as required by the Contract Documents;

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- .4 A fully executed and notarized Release of claims in such form as may be designated by the Owner; and
- .5 A written certification that:
 - a. the Contractor has reviewed the requirements of the Contract Documents;
 - b. the Work has been inspected by the Contractor for compliance with all requirements of the Contract Documents;
 - c. pursuant to this inspection, the Contractor certifies and represents that the Work complies in all respects with the requirements of the Contract Documents;
 - d. the Contractor further certifies and represents that all equipment and systems have been installed and tested in accordance with the Contract Documents and the Owner personnel training in the proper operation and maintenance of equipment is complete; and
 - e. the Contractor provides construction releases as required by the Contract Documents from each property owner on whose property an easement for construction of this project has been obtained by the Owner, such release to be in the forms to be provided by the Owner. This release is for the purpose of releasing the Owner and the Contractor from liability, claims, and damages arising from construction operations on or adjacent to the easement and includes proper restoration of the property after construction. It shall be the Contractor's sole responsibility to obtain all such releases and furnish them to the Owner.

9.8.4 The making of Final Payment shall constitute a waiver of all claims by the Owner against the Contractor except those arising from:

- .1 Unsettled liens and claims against the Owner;
- .2 Faulty, defective or non-conforming Work discovered or appearing after Substantial or Final Completion;
- .3 Failure of Work to comply with the requirements of the Contract Documents; and

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.4 Terms of any warranties contained in or required by the Contract Documents.

9.8.5 The acceptance of Final Payment shall constitute a waiver of all claims by the Contractor except those previously made in writing and identified by the Contractor as unsettled at the time of the Application for Final Payment.

9.8.6 Warranties required by the Contract Documents shall commence on the Date of Final Acceptance of the Work or designated portion thereof unless otherwise provided in writing.

9.9 PARTIAL OCCUPANCY OR USE

9.9.1 The Owner may occupy or use any completed or partially completed portion of the Work at any stage when such portion is designated by separate agreement with the Contractor, provided such occupancy or use is consented to by the insurer as required under Article 11.2.8 and authorized by public authorities having jurisdiction over the Work. Such partial occupancy or use may commence whether or not the portion is substantially complete, provided the Owner and the Contractor have accepted in writing the responsibilities assigned to each of them for payments, retainage, if any, security, maintenance, heat, utilities, damage to the Work and insurance, and have agreed in writing concerning the period for correction of the Work and commencement of warranties required by the Contract Documents. When the Contractor considers a portion substantially complete, the Contractor shall prepare and submit a list to the Owner's Project Manager as provided under Article 9.7. Consent of the Contractor to partial occupancy or use shall not be unreasonably withheld. The stage of the progress of the Work shall be determined by written agreement between the Owner's Project Manager and the Contractor or, if no agreement is reached, by decision of the Owner's Project Manager.

9.9.2 Immediately prior to such partial occupancy or use, the Owner or the Owner's Project Manager, and the Contractor shall jointly inspect the area to be occupied or portion of the Work to be used in order to determine and record the condition of the Work.

9.9.3 Unless otherwise agreed upon, partial occupancy or use of a portion or portions of the Work shall not constitute acceptance of Work not complying with the requirements of the Contract Documents.

END OF ARTICLE 9

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ARTICLE 10: PROTECTION OF PERSONS AND PROPERTY

10.1 SAFETY PRECAUTIONS AND PROGRAMS

10.1.1 The Owner and the Owner's Project Manager are not responsible for the means, methods, techniques, sequences or procedures utilized by the Contractor, or for safety precautions and programs in connection with the Work. The Contractor shall be solely responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the Work. This requirement applies continuously throughout the Contract performance, until Final Payment is made, and is not limited to regular working hours.

10.2 SAFETY OF PERSONS AND PROPERTY

10.2.1 The Contractor shall take reasonable precautions for safety of, and shall provide reasonable protection to prevent damage, injury or loss, to:

- .1 All employees on the Work and other persons who may be affected thereby;
- .2 All the Work and materials and equipment to be incorporated therein whether in storage off the site, under the care, custody or control of the Contractor or any of his Subcontractors, machinery and equipment. The Contractor shall comply with, and ensure that the Contractor's personnel and subcontracted personnel comply with all current applicable local, state and federal policies, regulations and standards relating to safety and health, including, by way of illustration and not limitation, the standards of the Virginia Occupational Safety and Health Administration for the General Industry and for the Construction Industry, the Federal Environmental Protection Agency Standards, the Manual of Accident Prevention in Construction published by the Associated General Contractors of America and the applicable standards of the Virginia Department of Environmental Quality.
- .3 Other property at or adjacent to the Work, including trees, shrubs, lawns, walks, pavements, roadways, structures and utilities not designated for removal, relocation or replacement in the course of construction.

10.2.2 The Contractor shall give all notices and comply with applicable laws, ordinances, permits, rules, regulations and orders of any public authority bearing on the safety of persons or property or their protection from damage, injury or loss.

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- 10.2.3** The Contractor shall at all times safely guard the Owner's property from injury or losses in connection with this Contract. He shall at all times safely guard and protect his own work and adjacent property as provided by law and the Contract Documents from damage. All security personnel, passageways, guard fences, lights, and other facilities required for protection of the property and the Work described herein shall be provided and maintained at the Contractor's expense.
- 10.2.4** The Contractor shall erect and maintain, as required by existing conditions and progress of the Work, all reasonable safeguards for safety and protection, including danger signs and other warnings against hazards, promulgating safety regulations and notifying owners and users of adjacent utilities.
- 10.2.5** When the use or storage of explosives or other hazardous materials or equipment is necessary for the execution of the Work, the Contractor shall exercise the utmost care and shall carry on such activities under the supervision of properly qualified personnel.
- 10.2.6** The Contractor shall promptly remedy at his own cost and expense all damage or loss to any property referred to in Articles 10.2.1.2 and 10.2.1.3. The Contractor shall perform such restoration by underpinning, repainting, rebuilding, replanting, or otherwise restoring as may be required or directed by the Owner's Project Manager or shall make good such damage in a satisfactory and acceptable manner. In case of failure on the part of the Contractor to promptly restore such property or make good such damage, the Owner may, upon two days written notice, proceed to repair, rebuild or otherwise restore such property as may be necessary, and the cost thereof will be deducted from any monies due or to become due to the Contractor under the Contract.
- 10.2.7** The Contractor shall give notice in writing at least 48 hours before breaking ground, to the Owner, all persons, Public Utility Companies, superintendents, inspectors or those otherwise in charge of property, streets, water pipes, gas pipes, sewer pipes, telephone cables, electric cables, railroads or otherwise, who may be affected by the Contractor's operation, in order that they may remove any obstruction for which they are responsible and have a representative on site to see that their property is properly protected. The Contractor is responsible for any damages or claims resulting from any excavation and shall defend, fully indemnify, and hold harmless the Owner from all actions resulting from such work regardless of whether the Contractor gave proper notice under this clause.
- 10.2.8** The Contractor shall protect all utilities encountered while performing its work, whether indicated on the Contract Documents or not. The Contractor shall maintain utilities in service until moved or abandoned. The Contractor shall exercise due care when excavating around utilities and shall restore any damaged utilities to the same condition or better as existed prior to starting the Work, at no cost to the Owner. The Contractor shall maintain operating utilities or other

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services, even if they are shown to be abandoned on the Contract Drawings, in service until new facilities are provided, tested and ready for use.

- 10.2.9** The Contractor shall return all improvements on or about the site and adjacent property that are not shown to be altered, removed or otherwise changed to conditions that existed prior to starting work.
- 10.2.10** The Contractor shall protect the Work, including but not limited to, the site, stored materials and equipment, excavations, and excavated or stockpiled soil or other material, intended for use in the Work, and shall take all necessary precautions to prevent or minimize damage to same or detrimental effect upon his performance or that of his Subcontractors, caused by or due to rain, run-off, floods, temperature, wind, dust, sand, and flying debris. For example, but not by way of limitation, Contractor shall, when necessary, utilize temporary dikes, channels or pumping to carry-off, divert or drain water, and as necessary tie-down or otherwise secure the Work and employ appropriate covers and screens.
- 10.2.11** The Contractor shall be responsible for the prevention of accidents and the protection of material, equipment and property.
- 10.2.12** The Contractor shall not load or permit any part of the Work to be loaded so as to endanger the safety of the Work, persons or adjacent property.
- 10.2.13** The Contractor has sole and complete responsibility for the correction of any safety violation and sole liability for the consequences of the violation. The Contractor shall give prompt written notice of any safety violation to the Owner's Project Manager.
- 10.2.14** The Contractor shall provide, or cause to be provided, all technical expertise, qualified personnel, equipment, tools and material to safely accomplish the Work, specified to be performed by the Contractor and Subcontractor(s).
- 10.2.15** The Contractor shall be responsible for the preservation of all public and private property, trees, monuments, etc., along and adjacent to the street and/or right-of-way, and shall use every precaution to prevent damage to pipes, conduits and other underground structures, curbs, pavements, etc., except those to be removed or abandoned in place and shall protect carefully from disturbance or damage all monuments and property marks until an authorized agent has witnessed or otherwise referenced their location and shall not remove them until directed. Any damage which occurs by reason of the operations under this Contract shall be completely repaired by the Contractor at the Contractor's expense.
- 10.2.16** The Contractor shall shore, brace, underpin, secure, and protect, as may be necessary, all foundations and other parts of existing structures adjacent to,

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adjoining, and in the vicinity of the site that may be affected in any way by excavations or other operations connected with the Work contained in this Contract. The Contractor shall be responsible for the giving of any and all required notices to any adjoining or adjacent property owned or other party before commencement of any Work. The Contractor shall indemnify and save the Owner harmless from any damages on account of settlements or loss of all damages for which the Owner may become liable in consequence of such injury or damage to adjoining and adjacent structures and their premises.

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

10.2.18 The Contractor shall provide to the Owner's Project Manager, a copy of the Contractor's written safety policies and safety procedures applicable to the Work within seven (7) days of the issuance of the Notice to Proceed.

10.3 EMERGENCIES

10.3.1 In any emergency affecting the safety of persons or property, the Contractor shall act to prevent threatened damage, injury, or loss to the Owner. The Contractor shall notify the Owner's Project Manager of the situation and all actions taken immediately thereafter. If, in the opinion of the Contractor, immediate action is not required, the Contractor shall notify the Owner's Project Manager of the emergency situation and take necessary steps. If any loss, damage, injury or death occurs that could have been prevented by the Contractor's prompt and immediate action or the emergency resulted from acts or omissions of the Contractor or his Subcontractors, or anyone directly or indirectly employed by any of them, or by anyone whose acts any of them may be liable, the Contractor shall defend, fully indemnify and hold harmless the Owner (including attorneys' fees) from all actions resulting from the emergency. Any additional compensation or extension of time claimed by the Contractor on account of emergency work shall be determined as provided in Article 12 "CHANGES IN THE WORK."

10.3.2 Prior to commencing his work and at all times during the performance of the Work, the Contractor shall provide the Owner with two, 24-hour emergency phone numbers where his representatives can be contacted.

END OF ARTICLE 10

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ARTICLE 11: BONDS AND INSURANCE

11.1 BONDS

- 11.1.1** The Contractor shall furnish to the Owner a performance bond in the sum of the contract price executed by a surety authorized to do business in Virginia, payable to the Town of Leesburg, Virginia, or such other entity as may be identified in the Contract, and conditioned upon the faithful performance of the contract in strict conformity with the plans, specifications, and conditions of the Contract Documents.
- 11.1.2** The Contractor shall furnish to the Owner a payment bond in the amount of the contract price payable to the Town of Leesburg or such other entity as may be identified in the Contract, and executed by a surety authorized to do business in Virginia. Such bond shall be conditioned on the prompt payment to all claimants who have and fulfill contracts to supply labor or materials to the Contractor for all material furnished or labor supplied or performed in the prosecution of the Work. "Labor and materials" shall include public utility services and reasonable rentals of equipment, but only for periods when the equipment rented is actually used at the project site.
- 11.1.3** If the amount of all Work subcontracted to any one Subcontractor is in excess of \$10,000, the Contractor may at his option require the Subcontractor to furnish a Labor and Material Payment Bond with surety thereon, in the amount of fifty percent of the amount of the Subcontract.
- 11.1.4** The Contractor shall ensure that all sureties providing bonds for the Project will give written notice to the Owner, at least thirty days prior to expiration or termination of the bond(s).
- 11.1.5** If the surety on any Bond furnished by the Contractor is declared bankrupt or becomes insolvent or its right to do business is terminated in any state where any part of the Project is located, the Contractor shall within five days thereafter substitute another Bond and surety, both of which shall be acceptable to the Owner.
- 11.1.6** If at any time, the Owner shall be or become dissatisfied with any surety or sureties then upon the Performance and Labor and Materials Payment Bonds, or if for any other reason, such bond shall cease to be adequate security to the Owner, the Contractor shall within five days after notice from the Owner to do so, substitute an acceptable bond(s) in such form and sum and signed by such other sureties as may be satisfactory to the Owner. The premium on such bond(s) shall be paid by the Contractor. No further payment shall be deemed due nor shall be made until the new sureties have been qualified and accepted by the Owner.
- 11.1.7** If more than one surety executes a bond, each shall be jointly and severally liable to the Owner for the entire amount of the bond.

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11.2 CONTRACTOR'S LIABILITY INSURANCE

11.2.1 The Contractor shall provide to the Owner, a Certificate of Insurance indicating that the Contractor has in force the coverage below prior to the start of any Work under this Contract. The Contractor agrees to maintain such insurance until the completion of this Contract. All required insurance coverages must be acquired from insurers authorized to do business in the Commonwealth of Virginia and acceptable to the Owner. The minimum insurance coverage shall be:

- .1 Workers Compensation Insurance – as required by federal, state, and municipal laws for the protection of all Contractors' employees working on or in connection with the project, shall be in accordance with Title, 2.2-4332, Va. Code Ann.
- .2 Comprehensive General Liability Bodily Injury and Property Damage: \$3,000,000 combined single limit/each occurrence in the primary policy or through the use of Umbrella or Excess Limits.

The General Liability Insurance shall include the following coverages; comprehensive form, premises-operations, explosion and collapse hazard, underground hazard, products/completed operations hazard, contractual liability insurance, broad form property damage including completed operations, contractors protective liability, personal injury (all insuring agreements) deleting the employee exclusion, and owners protective liability.

- .3 Contractor's Automobile Liability (Bodily Injury and Property Damage):

\$3,000,000 combined single limit per occurrence in the primary policy or through the use of Umbrella or Excess Limit

The Automobile Liability Insurance shall include the following coverages; comprehensive form, owned, hired, and non-owned.

- .4 Property insurance written on a builder's risk "all-risk" or equivalent policy form in the amount of the initial Contract Sum, plus value of subsequent Contract modifications and cost of materials supplied or installed by others, comprising total value for the entire Project at the site on a replacement cost basis without optional deductibles. Such property insurance shall be maintained, unless otherwise provided in the Contract Documents or otherwise agreed in writing by all persons and entities who are beneficiaries of such insurance, until final payment has been made as provided in Article 9.8 or until no person or entity other than the Owner has

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an insurable interest in the property required by this Article 11.5 to be covered, whichever is later. This insurance shall include interests of the Owner, the Contractor, Subcontractors and Sub-subcontractors in the Project. The property insurance shall be on an "all-risk" or equivalent policy form and shall include, without limitation, insurance against the perils of fire (with extended coverage) and physical loss or damage including, without duplication of coverage, theft, vandalism, malicious mischief, collapse, earthquake, flood, windstorm, falsework, testing and startup, temporary buildings and debris removal including demolition occasioned by enforcement of any applicable legal requirements.

If the liability insurance purchased by the Corporation has been issued on a "claims made" basis, the Corporation must comply with the following additional conditions. The limits of liability and the extensions to be included as described previously in these provisions, remain the same.

The Corporation must either:

1. Agree to provide certificates of insurance evidencing the above coverage for a period of two (2) years after final payment for the Agreement for General Liability policies. This certificate shall evidence a "retroactive date" no later than the beginning of the Corporation's work under this Agreement, or
2. Purchase the extended reporting period endorsement for the policy or policies in force during the term of this Agreement and evidence the purchase of this extended reporting period endorsement by means of a certificate of insurance or a copy of the endorsement itself.

11.2.2 Additional Insured – The Owner, its officers, elected and appointed officials, and employees shall be named as an additional insured in the Contractor's Commercial General Liability policy; evidence of the Additional Insured endorsement shall be typed on the certificate and a copy of the additional insured endorsement shall be forwarded to the Owner along with the copy of the insurance certificate.

11.2.3 Contract Identification – The insurance certificate shall state this Contract's number and title.

11.2.4 The Contractor shall secure and maintain until all work required under the Contract is accepted, such insurance as will protect the Contractor and the Owner from claims directly or indirectly arising or alleged to arise out of the performance of, or failure to perform the Work, or the condition of the Work or the jobsite, from claims by workers, suppliers, Subcontractors, and the general public; from claims made under safe place laws, or any law with respect to protection of adjacent landowners; and from any other claims for damages to property from operations by the Contractor or any Subcontractor,

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or anyone directly or indirectly employed by either of them.

The Contractor assumes all risks for direct and indirect damage or injury to the property or persons used or employed on or in connection with the Work contracted for, and of all damage or injury to any person or property wherever located, resulting from any action, omission, commission or operation under the Contract, or in connection in any way whatsoever with the contracted Work.

No acceptance or approval of any insurance by the Owner shall be construed as relieving or excusing the Contractor from any liability or obligation imposed upon the Contractor by the provisions of the Contract Documents.

- 11.2.5** These certificates and the insurance policies required by Article 11.2 shall contain a provision that coverages afforded under the policies will not be canceled or allowed to expire until at least thirty days prior written notice has been given to the Owner. If any of the foregoing insurance coverages are required to remain in force after final payment and are reasonably available, an additional certificate evidencing continuation of such coverage shall be submitted with the final Application for Payment as required by Article 9.8. Information concerning reduction of coverage on account of revised limits or claims paid under the General Aggregate, or both, shall be furnished by the Contractor with reasonable promptness in accordance with the Contractor's information and belief.
- 11.2.6** Neither the Owner nor the Owner's Project Manager shall have any obligation to review any Certificates of Insurance provided by the Contractor or to check or verify the Contractor's compliance with any and all requirements regarding insurance imposed by the Contract. The Contractor is fully liable for the amounts and types of insurance required herein and is not excused should any policy or Certificate of Insurance provided by the Contractor not comply with the Contract's insurance requirements.
- 11.2.7** If the Contractor fails to comply with the Contract's insurance requirements, the Owner shall be entitled to recover all amounts payable as a matter of law to the Owner or any other parties, including but not limited to the Owner's Project Manager, had the insurance coverage been in effect. Any recovery shall include but is not limited to interest for the loss of the use of such amounts of money, attorneys' fees, costs and expenses incurred in securing such determination and any other consequential damages.
- 11.2.8** Partial occupancy or use in accordance with Article 9.9 shall not commence until the insurance company or companies providing property insurance have consented to such partial occupancy or use by endorsement or otherwise. The Owner and the Contractor shall take reasonable steps to obtain consent of the insurance company or companies and shall, without mutual written consent, take no action with respect to partial occupancy or use that would cause cancellation, lapse or reduction of insurance.

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11.3 WAIVERS OF SUBROGATION

11.3.1 The Owner and Contractor waive all rights against (1) each other and any of the Subcontractors, Sub-subcontractors, agents and employees, each of the other, and (2) the Owner's Project Manager and Engineer or Architect or their consultants, separate contractors, if any, and any of their Subcontractors, Sub-subcontractors, agents and employees, for damages caused by fire or other causes of loss to the extent covered by property insurance obtained pursuant to this Article 11.5 or other property insurance applicable to the Work, except such rights as they have to proceeds of such insurance held by the Owner as fiduciary. The Owner or Contractor, as appropriate, shall require of his consultants, separate contractors, if any, and the Subcontractors, Sub-subcontractors, agents and employees of any of them, by appropriate agreements, written where legally required for validity, similar waivers each in favor of other parties enumerated herein. The policies shall provide such waivers of subrogation by endorsement or otherwise. A waiver of subrogation shall be effective as to a person or entity even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise, did not pay the insurance premium directly or indirectly, and whether or not the person or entity had an insurable interest in the property damaged.

11.4 ADDITIONAL INSURANCE PROVISIONS

11.4.1 A loss insured under Owner's property insurance shall be adjusted by the Owner as fiduciary and made payable to the Owner as fiduciary for the insureds, as their interests may appear, subject to requirements of any applicable mortgagee clause and of Article 11.5.10. The Contractor shall pay Subcontractors their just shares of insurance proceeds received by the Contractor, and by appropriate agreements, written where legally required for validity, shall require Subcontractors to make payments to their Sub-subcontractors in similar manner.

11.4.2 If required in writing by a party in interest, the Owner as fiduciary shall, upon occurrence of an insured loss, give bond for proper performance of the Owner's duties. The cost of required bonds shall be charged against proceeds received as fiduciary. The Owner shall deposit in a separate account proceeds so received, which the Owner shall distribute in accordance with such agreement as the parties in interest may reach. If after such loss no other special agreement is made and unless the Owner terminates the Contract for convenience, replacement of damaged property shall be performed by the Contractor after notification of a Change in the Work in accordance with Article 12.

11.4.3 The Owner as fiduciary shall have power to adjust and settle a loss with insurers unless one of the parties in interest shall object in writing within five days after occurrence of loss to the Owner's exercise of this power; if such objection is made, the dispute shall be resolved as provided in Article 7.4. The Owner as fiduciary shall, in the case of disputes, make settlement with insurers in accordance with orders of the Court.

END OF ARTICLE 11

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ARTICLE 12: CHANGES IN THE WORK

12.1 CHANGES IN THE WORK

12.1.1 The Owner, without invalidating the Contract and without notice to the surety, may order a Change in the Work consisting of additions, deletions, modifications or other revisions to the general scope of the Contract, or changes in the sequence of the performance of the Work. The Contract Price and the Contract Time shall be adjusted accordingly. All such Changes in the Work shall be authorized by written Change Order, and all Work involved in a Change shall be performed in accordance with the terms and conditions of this Contract. If the Contractor should proceed with a Change in the Work upon an oral order, by whomever given, it shall constitute a waiver by the Contractor of any claim for an increase in the Contract Price or Contract Time, on account thereof.

12.1.2 When the Owner and the Contractor have agreed upon a Change in the Work, but a written Change Order Document has not yet been executed, the Owner may, at its sole discretion and option, direct in writing the Contractor to proceed with the Change in the Work pending the execution of the formal Change Order. Contractor shall proceed in accordance with such direction.

12.1.3 The Contractor shall not begin work on any alteration requiring a modification until such modification has been executed by the Owner and the Contractor. If a satisfactory agreement cannot be agreed to for any item requiring a modification, the Owner reserves the right to terminate the contract as it applies to the items in question and make such arrangements as may be deemed necessary to complete the Work.

12.2 FIELD ORDER

12.2.1 A Field Order is a written order to the Contractor signed by the Owner or the Owner's Project Manager interpreting or clarifying the Contract Documents or directing the Contractor to perform minor changes in the Work. Any work relating to the issuance of a Field Order shall be performed promptly and expeditiously and without additional cost to the Owner and within the Contract Time, unless the Contractor submits a Proposed Change Order, defined below, which is approved by the Owner. Field Orders shall be numbered consecutively by date of issuance by the Owner or the Owner's Project Manager.

12.3 REQUEST FOR PROPOSAL

12.3.1 A Request For Proposal (“RFP”) describes a proposed Change in the Work. In response to a Request for Proposal issued by the Owner or the Owner’s Project Manager, the Contractor is required to submit a complete Proposal for the total cost and additional time, if any, necessary to perform the proposed Change in the

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Work. Requests For Proposals shall be numbered consecutively by date of issuance by the Owner or the Owner's Project Manager.

12.3.2 The Contractor's Proposal in response to an RFP shall be in the form prescribed by the Owner's Project Manager, including all appropriate back-up material.

12.4 PROPOSED CHANGE ORDER

12.4.1 A Proposed Change Order is a written request from the Contractor to the Owner requesting a change in the Contract Price and/or Contract Time. A Proposed Change Order may be submitted as a proposal in response to a Request For Proposal issued by the Owner or as a claim for an increase in the Contract Price and/or Contract Time pursuant to the issuance of a Field Order. A Proposed Change Order must be submitted within twenty days of the issuance of a Request For Proposal or a Field Order. Proposed Change Orders shall be numbered consecutively by date of issuance by the Contractor. The Contractor shall also indicate on the Proposed Change Order the number of the Request For Proposal or the Field Order to which it responds.

12.4.2 If a Request for Proposal provides for an adjustment to the Contract Price, the adjustment shall be based on one of the following methods:

- .1 mutual acceptance of a lump sum properly itemized and supported by sufficient substantiating data to permit evaluation;
- .2 unit prices stated in the Contract Documents or subsequently agreed upon;
- .3 cost to be determined in a manner agreed upon by the parties and a mutually acceptable fixed or percentage fee; or
- .4 as provided in Articles 12.5.3 and 12.5.4.

12.4.3 If it is necessary in this subparagraph to increase the Contract Time to perform the Change in the Work, the Contractor shall provide an estimate of the increase in the Contract Time which shall be negotiated by the parties to the Contract. The Contractor's request for a time extension shall be evaluated in accordance with the criteria described in Article 8.

12.4.4 If the Contractor's Proposed Change Order is rejected by the Owner as being within the scope of the Work required by the Contract Documents the Owner may, at its sole option and discretion, direct the Contractor to perform the Work which is the subject of the Proposed Change Order; the Contractor shall then promptly proceed with the Work. Nothing shall excuse the timely performance by the Contractor of the Work because any Proposed Change Order is pending.

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12.5 CHANGE ORDER

12.5.1 A Change Order is a written order to the Contractor signed by the Contractor and the Owner's Project Manager, issued after execution of the Contract, authorizing a Change in the Work or an adjustment in the Contract Price and/or the Contract Time. The Contract Price and the Contract Time may be changed only by Change Order. A Change Order signed by the Contractor indicates his agreement therein, including the adjustment in the Contract Price and/or the Contract Time. Change Orders shall be numbered consecutively by date of issuance by the Owner or the Owner's Project Manager and shall, if applicable, indicate the number of the Field Order(s), Request For Proposal(s) and/or Proposed Change Order(s) to which it relates.

12.5.2 If the Owner and the Owner's Project Manager determine that the Contractor's Proposed Change Order, submitted pursuant to Article 12.4 for a change in the Contract Price or Contract Time, is acceptable, the Owner's Project Manager shall prepare and issue, or cause to be prepared and issued, a Change Order which will authorize the Contractor to proceed with the Change in the Work for the cost and time stated in the Proposed Change Order, or as otherwise may be agreed upon by the parties. The amounts stated in the Change Order for the cost and time to perform the Change in the Work shall be binding on the parties.

.1 The contractors markup for allowable profit and overhead shall be limited to 10%.

12.5.3 After issuance of the Change Order, the Contractor shall ensure that the amount of the Performance and Payment Bond coverage has been revised to reflect the increase in the Contract Price due to the Change Order.

12.5.4 If the Contractor's Proposed Change Order is not acceptable to the Owner and the Owner's Project Manager or if the parties are unable to otherwise agree as to the cost and time necessary to perform the Change in the Work, the Owner may, at its sole option and discretion, direct the Contractor to perform the Work on a time and material basis. The Contractor shall then promptly proceed with the Work.

12.5.5 If the Owner and the Owner's Project Manager elect to have the Change in the Work performed on a time and material basis, the same shall be performed, whether by the Contractor's forces or the forces of any of his Subcontractors or Sub-subcontractor's, at actual cost to the entity performing the Change in accordance with the time and material provisions included in the Road and Bridge Specifications of the Virginia Department of Transportation, current edition.

12.5.6 Prior to starting the work on a time and material basis, the Contractor shall notify the Owner's Project Manager in writing as to what labor, materials, equipment or

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rentals are to be used for the Change in the Work. During the performance of the Change, the Contractor shall submit to the Owner daily time and material tickets, which shall list the categories and amounts of labor and equipment for which Change Order compensation is to be charged for the previous work day. Such tickets shall be submitted in strict accordance with the time and material provisions included in the Road and Bridge Specifications of the Virginia Department of Transportation.

- 12.5.7** The Contractor shall commence submission of daily time and material tickets immediately upon commencement of the Change Order Work and continue to submit them until completion of the Change Order Work. The Owner may require authentication of all time and material tickets and invoices by persons designated by the Owner for such purpose.
- 12.5.8** The failure of the Contractor to provide any required authentication shall, if the Owner elects to treat it as such, constitute a waiver by the Contractor of any claim for the cost of that portion of the Change in the Work covered by a non-authenticated ticket or invoice; provided, however, that the authentication of any such ticket or invoice by the Owner shall not constitute an acknowledgment by the Owner that the items thereon were reasonably required for the Change in the Work.
- 12.5.9** The Contractor shall submit his complete submission of the reasonable actual cost and time to perform the Change in the Work within twenty days of the request of the Owner's Project Manager to do so. The Owner and the Owner's Project Manager shall review the costs and time submitted by the Contractor on the basis of reasonable expenditures and savings of those performing the Change in the Work. If such costs and time are acceptable to the Owner and the Owner's Project Manager, or if the parties otherwise agree to the actual reasonable cost to perform the Change in the Work, the Owner's Project Manager shall issue a Change Order for the cost and time agreed upon. The amounts stated in the Change Order for the cost and time to perform the Change in the Work shall be binding upon the parties.
- 12.5.10** The Contractor shall be entitled to costs as provided for in Article 12.4 which the Contractor, or his Subcontractors, may incur as a result of delays, interferences, suspensions, changes in sequence or the like, which are unreasonable, arising from the performance of any and all changes in the Work, caused by acts or omissions of the Owner, performed pursuant to this Article 12.
- 12.5.11** If any dispute should arise between the parties with respect to an increase or decrease in the Contract Price or an extension or reduction in the Contract Time or as a result of a Change in the Work, the Contractor shall not suspend performance of a Change in the Work or the Work itself unless otherwise so ordered by the Owner's Project Manager in writing. Disputes must be resolved

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pursuant to Article 7.4 of the Contract. The Owner will, however, pay the Contractor up to the Owner's Project Manager's estimated value of the Change in the Work, regardless of the dispute, if the Change in the Work results in an increase in the Contract Price; and the Owner will have the right to decrease the Contract Price up to the Owner's Project Manager's estimated value of the Change in the Work, regardless of the dispute, if the Change in the Work results in a decrease in the Contract Price.

12.6 UNILATERAL CHANGE ORDER

12.6.1 In the event that the parties are unable to agree as to the reasonable cost and time to perform the Change in the Work and the Owner does not elect to have the Change in the Work performed on a time and material basis, the Owner and the Owner's Project Manager shall make a unilateral determination of the reasonable cost and time to perform the Change in the Work, based upon their own estimates, the Contractor's submission or a combination thereof. A Change Order shall be issued for the amounts of cost and time determined by the Owner and the Owner's Project Manager and shall become binding upon the Contractor unless the Contractor submits his protest in writing to the Owner within ten days of the issuance of the Change Order. The procedure for the resolution of the Contractor's protest shall be as described in Article 12.10. The Owner has the right to direct in writing the Contractor to perform the Change in the Work, which is the subject of such Unilateral Change Order. Failure of the parties to reach an agreement regarding the cost and time of performing the Change in the Work, or any pending protest, shall not relieve the Contractor from performing the Change in the Work promptly and expeditiously.

12.7 DECREASES AND WORK NOT PERFORMED

12.7.1 Should it be deemed expedient by the Owner or the Owner's Project Manager at any time that the Contract Work is in progress to decrease the dimensions, quantity of material or work, or vary in any other way the Work herein contracted for, the Owner or the Owner's Project Manager shall have the full power to do so, and shall order, in writing, such decreases to be made or performed without affecting the enforcement of the Contract. The Contractor shall, in pursuance of such written orders and directions from the Owner or the Owner's Project Manager, execute the work ordered, and the difference in expense occasioned by such decrease so ordered shall be deducted from the amount payable under this Contract.

12.7.2 If Work is not performed, and such deletion of Work is not approved by the Owner, the Owner's Project Manager shall ascertain the amount of the credit due the Owner, based on the reasonable value of the labor and materials so deleted, for the lesser amount of materials and labor required.

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12.7.3 If Work is deleted from the Contract by Change Order, the amounts to be credited to the Owner shall reflect the same current pricing as if the Work were being added to the Contract at the time the deletion is ordered, and documentation will be required for a credit as specified in Article 12.4. If such deleted materials and equipment shall have already been purchased and stored on site and cannot be used in other projects or returned for credit or cannot be returned for credit at the price paid by the Contractor at the time of purchase, the Contractor shall be entitled, upon proper documentation and certification, to an adjustment in the pricing of the credit to avoid hardship to the Contractor. If necessary in order to establish such reasonable value, the Contractor may be required to submit a detailed breakdown of his original bid for the items or Work involved.

12.8 CHANGES IN LINE AND GRADE

12.8.1 The Owner reserves the right through the Owner's Project Manager to make such alterations in the line and grade of various structures or pipelines shown on the drawings, as may be necessitated by conditions found during construction or that in the judgment of the Owner's Project Manager appears advisable. The Contractor shall not claim forfeiture of Contract by reason of such changes by the Owner's Project Manager.

12.8.2 In case of a fixed price contract, the price of the Work shall be negotiated as herein provided. If such alterations or changes diminish the quantity of Work to be done, they shall not constitute a claim for damages or for loss of anticipated profits in the Work which may be dispensed with, and the Work as constructed shall be paid for in accordance with the Contract prices as established for such Work under this Contract. In the case of a unit price, or partial unit price, contract, the altered Work shall be performed at the appropriate unit price.

12.8.3 The Contractor shall employ a certified Land Surveyor to establish a base line and set bench marks for the Contractor's use as necessary to stake the basic layout of the Work. Where new construction connects to existing facilities, it shall be the responsibility of the Contractor to check and establish the location of all existing facilities prior to construction of the new facilities.

12.8.4 All stakes, bench marks, and other base line information provided by the Owner or the Owner's Project Manager shall be carefully preserved by the Contractor, and in case of their removal by any cause without prior written consent from the Owner, such stakes, bench marks, and other base line information will be replaced by the Contractor at the Contractor's sole expense.

12.8.5 The dimensions for lines and elevations for grades of the structures, appurtenances, and utilities are indicated on the Drawings, together with pertinent information required for laying out the Work. Utility locations are approximate and it shall be the Contractor's responsibility to determine the exact location of

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the utilities prior to commencing Work in all areas where conflicts with utility installations are possible. If site conditions vary from those indicated, the Contractor shall notify the Owner immediately, who will promptly direct any adjustment as required. The locations of existing utilities, including underground utilities, which may affect the Work, are indicated on the drawings or in the specifications insofar as their existence and location were known at the time of preparation of the drawings. However, nothing in these drawings or specifications shall be construed as a guarantee that such utilities are in the location indicated or that they actually exist, or that other utilities are not within the area of the operations. The Contractor shall make all necessary investigations to determine the existence and locations of such utilities. The Contractor will be held responsible for any damage to and maintenance and protection of existing utilities and structures, of both public and private ownership. Acceptability of restored utility installation shall be determined by the respective utility Owner. All utilities shall remain in service during the construction of this project unless written authorization of interruption of service is received from the respective utility Owner and the interruption is approved by the Project Manager.

- 12.8.6** Contractor shall notify the Owner immediately upon discovery of any apparent errors in the lines or grades. If Contractor proceeds with knowledge of such apparent error without first receiving written clarification from the Owner's Project Manager, the Contractor does so at his own risk.

12.9 DIFFERING SITE CONDITIONS

- 12.9.1** The Contractor shall promptly, and before the conditions are disturbed, give written notice to the Owner's Project Manager of (a) subsurface or latent physical conditions at the site which differ materially from those indicated in the Contract Documents, or (b) unknown physical conditions at the site, of an unusual nature, which differ materially from those ordinarily encountered and generally recognized as inhering in work of the character provided for in the Contract and which were not reasonably anticipated as a result of the investigation required by Article 1.2.2.
- 12.9.2** The Owner's Project Manager shall investigate the site conditions promptly after receiving the notice. If the conditions do materially so differ and cause an increase or decrease in the cost or time of performance, the provisions of Article 12 "Changes in the Work" shall apply.
- 12.9.3** No request by the Contractor for a Change Order under this Article shall be allowed, unless the Contractor has given the required written notice.
- 12.9.4** No request by the Contractor for a Change Order under this Article shall be allowed if made after final payment under the Contract.

GENERAL CONDITIONS

12.10 CLAIMS FOR ADDITIONAL COST AND/OR TIME

12.10.1 If the Contractor wishes to make a claim for an increase in the Contract Price and/or Contract Time, he shall give the Owner written notice thereof within seven calendar days after the occurrence of the event giving rise to such claim. This notice shall be given by the Contractor before proceeding to execute the Work, except in an emergency endangering life or property in which case the Contractor shall proceed as provided in Article 10. No claim shall be allowed and no amounts shall be paid for any costs incurred more than ten calendar days prior to the time notice is given to the Owner. Any change in the Contract Price or Contract Time resulting from such claim must be authorized by Change Order. The Contractor's complete claim submittal for an increase in the Contract Price shall be submitted no later than twenty calendar days after the Work for which the claim is made has been completed or after the request of the Owner or the Owner's Project Manager, whichever is earlier.

12.10.2 If the Contractor claims that additional cost or time is involved because of, but not limited to, any of the following circumstances, the Contractor shall make such claim as provided in Subparagraph 12.10.1: (1) any written interpretation pursuant to Article 2, (2) any order by the Owner to stop the Work pursuant to Article 3.3 where the Contractor was not at fault, (3) failure of payment by the Owner pursuant to Article 9, or (4) any written order for a minor change in the Work issued pursuant to Article 12.8.1.

12.11 ATTORNEYS' FEES AND OTHER EXPENSES

12.11.1 In recognition of the public monies being administered by the Owner to fund this Contract, the Contractor agrees that he will not submit, assert, litigate or otherwise pursue any frivolous or unsubstantiated delay claims. If the Contractor's delay claim, or any separate item of a delay claim, is determined through litigation or other dispute resolution process to be false or to have no basis in law or fact, the Contractor shall be liable to the Owner and shall pay it for all Investigation Costs incurred by the Owner. These costs include investigating, analyzing, negotiating, appealing, defending, and litigating the false or baseless delay claims, attorneys' fees, audit costs, accountants' fees, expert witness' fees, additional architect/engineer expenses and any other consultant costs. The amount to be paid hereunder to the Owner shall be the percentage of the Owner's total Investigation Costs in an amount equal to the percentage of the Contractor's total delay claim which is determined to be false or to have no basis in fact.

12.11.2 If the Contractor breaches any obligation under the Contract Documents, the Contractor shall reimburse the Owner for all costs and expenses incurred by the Owner relating to such breach, including but not limited to, attorneys' fees, audit

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costs, accountants' fees, expert witness' fees, additional architectural or engineering expenses, and any other consultant costs.

- 12.11.3** If the Owner prevails in a claim brought against the Contractor, including but not limited to, claims for fraud or misrepresentation, overpayment, defective work, delay damages, and recovery of termination expenses, the Contractor shall reimburse the Owner for all costs and expenses incurred by the Owner relating to such claim, including but not limited to, attorneys' fees, audit costs, accountants' fees, expert witness' fees, additional architect or engineering expenses, and any other consultant costs.

END OF ARTICLE 12

GENERAL CONDITIONS

ARTICLE 13: UNCOVERING AND CORRECTION OF WORK

13.1 UNCOVERING OF WORK

13.1.1 If any portion of the Work should be covered contrary to the request of the Owner's Project Manager or to requirements specifically expressed in the Contract Documents or to requirements of applicable Construction Permits, it must, if required in writing by the Owner's Project Manager, be uncovered for its observation and shall be replaced at the Contractor's expense.

13.1.2 If any portion of the Work has been covered that the Owner's Project Manager has not specifically requested to observe prior to being covered, the Owner's Project Manager may request to see such Work and it shall be uncovered by the Contractor. If such Work complies with the Contract Documents, the cost of uncovering and replacement shall, by appropriate Change Order, be charged to the Owner. If such Work does not comply with the Contract Documents, the Contractor shall pay such costs unless the Owner caused this condition, in which event the Owner shall pay such costs.

13.2 CORRECTION OF WORK

13.2.1 The Contractor shall promptly reconstruct, replace or correct all Work rejected by the Owner's Project Manager as defective or as failing to conform to the Contract Documents or as not in accordance with the guarantees and warranties specified in the Contract Documents whether observed before or after Substantial Completion and whether or not fabricated, installed or completed. The Contractor shall bear all costs of correcting such rejected Work, including compensation for the Owner's Project Manager and any other additional services made necessary thereby.

13.2.2 The Contractor, unless removal is waived by the Owner, shall remove from the site all portions of the Work that are defective or non-conforming, or if permitted or required, he shall correct such Work in place at his own expense promptly after receipt of notice, and such rejected Work shall not thereafter be tendered for acceptance unless the former rejection or requirement for correction is disclosed.

13.2.3 If the Contractor does not proceed with the correction of such defective or non-conforming Work within a reasonable time fixed by written notice from the Owner's Project Manager, the Owner may either:

- .1 By separate contract or otherwise replace or correct such Work and charge the Contractor the cost occasioned the Owner thereby and remove and store the materials or equipment at the expense of the Contractor; or

GENERAL CONDITIONS

.2 Terminate this Contract as provided in Article 14.3 "DEFAULT TERMINATION."

13.2.4 The Contractor shall bear the cost of making good all work of the Owner or separate Contractors destroyed or damaged by such correction or removal.

13.2.5 Nothing contained in this Article 13.2 shall be construed to establish a period of limitation with respect to any other obligation that the Contractor might have under the Contract Documents, including Article 4.7 "WARRANTY" hereof. The establishment of the period of one year after the Date of Final Completion or such longer period of time as may be prescribed by law or by the terms of any warranty required by the Contract Documents relates only to the specific obligation of the Contractor to correct the Work, and has no relationship to the time within which his obligation to comply with the Contract Documents may be sought to be enforced, or to the time within which proceedings may be commenced to establish the Contractor's liability with respect to his obligations other than specifically to correct the Work.

13.3 ACCEPTANCE OF DEFECTIVE OR NON-CONFORMING WORK

13.3.1 If the Owner or its Project Manager prefers to accept defective or non-conforming Work, it may do so instead of requiring its removal and correction. In this case, a Change Order will be issued to reflect a reduction in the Contract Price where appropriate and equitable, or the Owner may elect to accept payment in materials or services, in lieu of a reduction in the Contract Price. If the amount of a reduction is determined after Final Payment, it shall be paid on demand to the Owner by the Contractor.

END OF ARTICLE 13

GENERAL CONDITIONS

ARTICLE 14: TERMINATION OF THE CONTRACT

14.1 TERMINATION FOR THE CONVENIENCE OF THE OWNER

14.1.1 The Owner may, at any time upon ten days written notice to the Contractor, terminate, without prejudice to any right or remedy of the Owner, the whole or any portion of the Work for the convenience of the Owner. This Notice of Termination shall specify that portion of the Work to be terminated and the effective date of termination. The Contractor's sole remedy, in the event of such termination, will be the allowable termination costs permitted by Article 14.2 "ALLOWABLE CONVENIENCE TERMINATION COSTS."

14.1.2 The Contractor shall include termination clauses identical to Article 14 in all subcontracts and purchase orders related to the Work. Failure to include these termination clauses in any subcontracts or purchase orders shall preclude recovery of any termination costs related to that subcontract or purchase order.

14.1.3 Non-appropriation Clause

Notwithstanding anything contained herein to the contrary, this contract shall be terminated if all of the following events shall have occurred:

1. Funds are not appropriated for a subsequent fiscal period during the term of this contract for the acquisition of substantially the same functions as provided for herein, and written notice thereof is given to CONTRACTOR at least thirty (30) days prior to the first day of such subsequent fiscal periods or within five (5) days of the approval of the final budget for such fiscal year, whichever occurs later.

2. Town has exhausted all funds legally available for payment under this contract.

Upon such termination, Contractor's only remedy shall be to terminate the contract at the end of the fiscal period during which notice is given. Payment in compliance with the contract for materials, goods, and services rendered hereunder during the fiscal year at the end of which termination occurs, without penalty, termination, profit or overhead expenses of any kind shall constitute full performance on the part of the Town.

14.2 ALLOWABLE CONVENIENCE TERMINATION COSTS

14.2.1 After complying with the provisions of Article 14.4, the Contractor may submit a termination claim, not later than six months after the effective date of its

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termination, unless one or more extensions of three months each are granted by the Owner in response to the Contractor's written request.

14.2.2 The Owner shall pay the Contractor's reasonable costs of termination, plus a mark-up of ten percent for profit and overhead. This amount will not exceed the original contract price, reduced by any payments made prior to Notice of Termination, and further reduced by the price of the supplies not delivered, or the service not provided. This Contract shall be amended accordingly, and the Contractor shall be paid the agreed amount.

14.2.3 If the parties cannot agree on the amount to be paid to the Contractor by reason of termination under this clause, the Owner shall pay to the Contractor the amounts, as determined by the Owner's Project Manager as follows, without duplicating any amounts which may have already been paid under the preceding paragraph of this clause:

.1 With respect to all Contract performance prior to the effective date of Notice of Termination, the total of:

- a. cost of work performed or supplies delivered;
- b. the costs of settling and paying any reasonable claims as provided in Article 14.4; and
- c. a mark-up of ten percent for profit and overhead. Neither the Contractor nor any Subcontractor shall be entitled to profit or overhead associated with the portion of the work not performed, nor to profit associated with costs of demobilization.

.2 The total sum to be paid under .1 above shall not exceed the contract price, as reduced by the amount of payments otherwise made, and as further reduced by the contract price of work not done or supplies not delivered. The Owner may subtract from the amount claimed by the Contractor any claim the Owner has against the Contractor

14.2.4 If the Contractor is not satisfied with any payments that the Owner's Project Manager shall determine to be due under this clause, the Contractor may proceed in accordance with Article 7.4 "DISPUTES."

14.2.5 If the Contractor would have sustained a loss on the entire Contract had it been completed, no profit shall be included or allowed and an appropriate adjustment shall be made reducing the amount of the settlement to reflect the indicated rate of loss.

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14.3 DEFAULT TERMINATION

14.3.1 The Owner may, upon ten days written notice to the Contractor, terminate, without prejudice to any right or remedy of the Owner, the Contract for default, in whole or in part, and may take possession of the Work and complete the Work by contract or otherwise in any of the following circumstances:

- .1 The Contractor refuses or fails to prosecute the Work or any separable part thereof with such diligence as will ensure the Substantial Completion of the Work within the Contract Time, or fails to meet any milestones established in the Contract Documents or fails to substantially complete the Work within this period;
- .2 The Contractor is in default in carrying out any provision of the Contract for a cause within his or his Subcontractors' control;
- .3 The Contractor fails to supply a sufficient number of properly skilled workers or proper equipment or materials;
- .4 The Contractor fails to make prompt payment to Subcontractors or for materials or labor;
- .5 The Contractor disregards laws, permits, ordinances, rules, regulations, or orders of any public authority having jurisdiction;
- .6 The Contractor breaches any provision of the Contract Documents;
- .7 The Contractor voluntarily abandons the Project;
- .8 Upon at least thirty calendar days prior written notice by the Owner to the Contractor, at any time during the term of the Agreement, the Owner determines that maintaining the Agreement in force will harm, bring into disrepute, or affect the integrity of the Owner.

14.3.2 Upon termination of this Agreement under this Article, the Contractor shall remove all of his employees and property from the Project in a smooth, orderly, and cooperative manner.

14.3.3 The right of the Contractor to proceed shall not be terminated under Article 14.2 because of any delays in the completion of the Work due to unforeseeable causes beyond the control and without the fault or negligence of the Contractor or his Subcontractors as specifically set forth in Article 8, "DELAYS AND EXTENSIONS OF TIME."

GENERAL CONDITIONS

14.3.4 If, after the Contractor has been terminated for default pursuant to Article 14.3, it is determined that none of the circumstances set forth in Article 14.3.1 exist, then such termination shall be considered a termination for convenience pursuant to Article 14.1. In such case, the Contractor's sole remedy will be costs permitted by Article 14.2.

14.3.5 If the Owner terminates the Contract, the Contractor shall not be entitled to receive any further payment until the Work is finished. If the unpaid balance of the Contract Price exceeds the cost of completing the Work including compensation for additional managerial, administrative and inspection services and any damages for delay, such excess amount shall be paid to the Contractor. If such expenses exceed the unpaid balance, the Contractor and his sureties shall be liable to the Owner for such excess amount.

14.3.6 If the right of the Contractor to proceed with the Work is partially or fully terminated, the Owner may take possession of and utilize in completing the Work such materials, appliances, supplies, plant and equipment as may be on the site of the terminated portion of the Work and necessary for the completion of the Work. If the Owner does not fully terminate the right of the Contractor to proceed, the Contractor shall continue to perform the part of the Work that is not terminated.

14.4 GENERAL TERMINATION PROVISIONS

14.4.1 After receipt of a Notice of Termination from the Owner, pursuant to Article 14.1 or 14.3, and except as otherwise directed by the Owner, the Contractor shall:

- .1 Stop Work under the Contract on the date and to the extent specified in the Notice of Termination;
- .2 Place no further purchase orders or subcontracts for materials, services, or facilities, except as may be necessary for completion of such portion of the Work under the Contract that is not terminated;
- .3 Terminate all purchase orders and subcontracts to the extent that they relate to the performance of Work terminated by the Notice of Termination;
- .4 At the option of the Owner, assign to the Owner in the manner, at the times and to the extent directed by the Owner, all of the rights in the contracts so terminated, in which case, the Owner shall have the right, at his discretion, to settle or pay any or all claims arising out of the termination of such purchase orders and subcontracts;
- .5 Settle all outstanding liabilities and all claims arising out of such termination of purchase orders and subcontracts, with the approval

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or ratification of the Owner, to the extent he may require, which approval or ratification shall be final for all the purposes of this Article;

- .6 Transfer title and deliver to the entity or entities designated by the Owner, in the manner, at the times and to the extent directed by the Owner to the extent specifically produced or specifically acquired by the Contractor for the performance of such portion of the Work as has been terminated, the following:
 - a. The fabricated or unfabricated parts, Work in progress, partially completed supplies and equipment, materials, parts, tools, dies, jigs, and other fixtures, completed work, supplies and other material produced as part of, or acquired in connection with the performance of, the Work terminated by the Notice of Termination; and
 - b. The completed or partially completed plans, drawings, Shop Drawings, submittals, information, releases, manuals, and other property related to the Work and which, if the Contract had been completed, would have been required to be furnished to the Owner.
- .7 Use his best efforts to sell, in the manner, at the times, to the extent and at the price or prices directed or authorized by the Owner or Owner's Project Manager, any property of the types referred to in Article 14.4.1.6; provided, however, that the Contractor:
 - a. Shall not be required to extend credit to any buyer; and
 - b. May acquire such property under the conditions prescribed by and at a price or prices approved by the Owner; and provided further that the proceeds of any such transfer or disposition shall be applied in reduction of any payments to be made by the Owner to the Contractor under the Contract or shall otherwise be credited to the Contract Price covered by the Contract or paid in such other manner as the Owner may direct;
- .8 Complete performance of such part of the Work as shall not have been terminated by the Notice of Termination; and
- .9 Take such action as may be necessary, or as the Owner or Owner's Project Manager may direct for the protection and preservation of

GENERAL CONDITIONS

the property related to the Contract that is in the possession of the Contractor and in which the Owner has or may acquire an interest.

14.4.2 If the convenience termination, pursuant to Article 14.1, is partial, the Contractor may file with the Owner a claim for an equitable adjustment of the Contract Price relating to the continued portion of the Contract (the portion not terminated by the Notice of Termination) for costs increased because of such partial termination. Such equitable adjustment as may be agreed upon shall be made in the Contract Price. Any claim by the Contractor for an equitable adjustment under this Article must be submitted in writing to the Owner's Project Manager within sixty days from the Notice of Termination.

14.4.3 The Contractor shall refund to the Owner any amounts paid by the Owner to the Contractor in excess of costs reimbursed under Article 14.4 within sixty days of receipt of a written request from the Owner to do so.

END OF ARTICLE 14

May 10, 2017

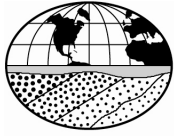
Geotechnical Engineering Report

**Tuscarora Creek
Flood Mitigation
Leesburg, Virginia**



**GeoConcepts
Engineering, Inc.**

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May 10, 2017

Mr. Tucker Clevenger
AMEC Foster Wheeler Environment & Infrastructure, Inc.
14424 Albemarle Point Place, Suite 115
Chantilly, Virginia 20151

**Subject: Geotechnical Engineering Report, Tuscarora Creek
Flood Mitigation, Leesburg, Loudoun County, Virginia
(GeoConcepts Project No. 15265)**

Dear Mr. Clevenger:

GeoConcepts Engineering, Inc. (GeoConcepts) is pleased to present the following geotechnical engineering report prepared for the Tuscarora Creek Flood Mitigation project located in Leesburg, Virginia.

We appreciate the opportunity to serve as your geotechnical consultant on this project. Please do not hesitate to contact me if you have any questions or want to meet to discuss the findings and recommendations contained in the report.

Sincerely,

GEOCONCEPTS ENGINEERING, INC.

Tadeusz (Ted) W. Lewis, P.E.
Principal
tlewis@GeoConcepts-Eng.Com

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Figure 1: Site Vicinity Map

Figure 2: Footing Undercut Detail – Flood Wall Section 1A

Figure 3: Subdrainage Details – Flood Wall Section 2

Appendix A: Subsurface Investigation

Appendix B: Soil Laboratory Test Results

Appendix C: Engineering Calculations

1.0 Scope of Services

This geotechnical engineering report presents the results of the field investigation, soil laboratory testing, and engineering analysis of the geotechnical data. This report specifically addresses the following:

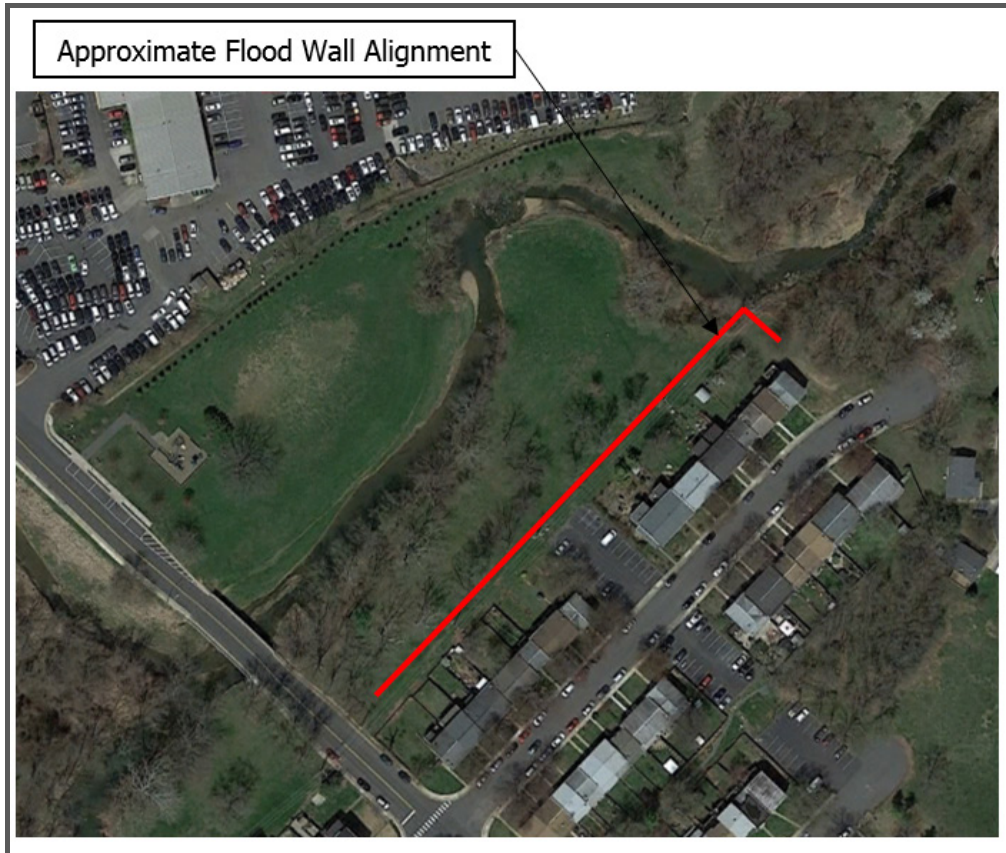
- An evaluation of subsurface conditions within the area of the proposed flood mitigation wall.
- Design recommendations for support of the proposed flood mitigation wall.
- Recommendations for temporary dewatering during construction of foundations.
- Earthwork recommendations for construction of loadbearing fills, including an assessment of on-site soils to be excavated for re-use as fill.
- Rock excavation requirements for the proposed site development, as applicable.

Services not specifically identified in the contract for this project are not included in the scope of services.

2.0 Site Description and Proposed Construction

The site is located at 570 Harrison Street SE, Leesburg, Virginia. A site vicinity map is presented as Figure 1 at the end of this report. The site consists of a community association common grounds bounded to the northwest by Tuscarora Creek and to the southeast by townhomes. The elevation at the site ranges from approximately elevation (EL) 300 to EL 296, sloping downward towards Tuscarora Creek.

Based on plans provided to us by AMEC dated August 6, 2015, the proposed construction consists of a flood mitigation wall, approximately 600 feet long with an expected maximum exposed wall height of 3 feet. We understand that based on discussions with the Town of Leesburg staff and your analysis, it is expected that the wall will only be exposed to water for relatively short durations of less than a few hours. We further understand the proposed flood wall to be cantilever concrete construction, with a proposed alignment as shown below.



3.0 Subsurface Conditions

Subsurface conditions were investigated by drilling five test borings in the proposed flood wall area. Test boring logs and a boring location plan are presented in Appendix A of this report.

3.1 Geology

The site lies within the Piedmont Physiographic Province of Virginia. The Piedmont is bordered to the east by the Coastal Plain Physiographic Province and to the west by the Blue Ridge Physiographic Province and contains several fault bordered basins. Bedrock in the Piedmont typically consists of highly weathered metamorphic and igneous bedrock. Surface topography in the Piedmont is the result of millions of years of erosion. Specifically, according to the *Geologic Map of the Leesburg Quadrangle* (Toewe, 1966), the site is mapped in the Newark Group Conglomerate Formation and the Diabase Formation of the Triassic geologic period, with surficial Alluvium present along Tuscarora Creek.

Based on our subsurface investigation, the sediments and strata correspond favorably to the geologic publications. The underlying natural soils are residual materials derived from the physical and chemical weathering of the underlying bedrock.

3.2 Published Soils

A review of the Loudoun County soils maps indicates that the proposed flood wall will be built on Class IV soils. Specifically, Soil Mapping Units 02A, 67B, 67C, and 69A are located on the site. According to the *Interpretive Guide to the Use of Soils Maps, Loudoun County, Virginia* (2000), these soil mapping units may have low soil/bearing strength, seasonal high water tables, and high shrink/swell characteristics. The groundwater conditions are discussed in Section 3.4 of this report. The Loudoun County soils mapping is shown on Figure 4 in Appendix A of this report, and is presented in the table below.

Soil Type Characteristics by Mapping Unit

Mapping Unit	Soil Group	Slope (%)	Hydrologic Soil Group	Drainage	Published Depth to Water Table	Published Depth to Restrictive Feature
02A	Codorus silt loam	0 to 2	B/D	Somewhat poorly drained	About 10 to 24 inches	> 80 inches
67B	Jackland and Haymarket soils	2 to 7	C, D	Well drained, somewhat poorly drained	> 80 inches, About 10 to 20 inches	> 80 inches
67C						
69A	Elbert silty clay loam	0 to 2	C/D	Poorly drained	About 0 to 12 inches	40 to 60 inches to paralithic bedrock

3.3 Stratification

The subsurface materials encountered have been stratified for purposes of our discussions herein. These stratum designations do not imply that the materials encountered are continuous across the site. Stratum designations have been established to characterize similar subsurface conditions based on material gradations and parent geology. Per GeoConcepts' convention, Stratum A is reserved for existing fill soils. Existing fill soils were not encountered in the test borings completed at the site. Accordingly, Stratum A was not used in this report. The generalized subsurface materials encountered in the test borings completed at the site have been assigned to the following strata:

Stratum B1 (Residual Soil) soft to very stiff, FAT CLAY (CH), LEAN CLAY (CL), and ELASTIC SILT (MH), with various amounts of sand, contains organics, quartz, and rock fragments, moist, brown and tan

Stratum B2 (Weathered Rock) dense to very dense and hard to very hard, sandy LEAN CLAY (CL), clayey SAND (SC), and silty SAND (SM), moist to wet, tan, brown, and light gray

The two letter designations included in the strata descriptions presented above and on the test boring logs represent the Unified Soil Classification System (USCS) group symbol and group name for the samples based on visual classifications per ASTM D-2488. It should be noted that visual classifications per ASTM D-2488 may not match classifications determined by laboratory testing per ASTM D-2487.

3.4 Groundwater

Groundwater level observations were made in the field during drilling and at the completion of the test borings. A summary of the water level readings rounded off to the nearest 0.5 feet elevation is presented in the table below.

Test Boring No.	Depth to Groundwater (ft)	Groundwater Elevation (ft)
B-1	6.0	291.0
B-2	5.0	291.0

Test Boring No.	Depth to Groundwater (ft)	Groundwater Elevation (ft)
B-3	NE	NE
B-4	5.5	290.5
B-5	NE	NE

NE = Not Encountered

As shown in the table above, groundwater was encountered at depths of about 5 to 6 feet below the existing ground surface, or at about EL 291.

The groundwater observations presented herein are considered to be an indication of the groundwater levels at the dates and times indicated. Where the generally impervious soils within Strata B1 and B2 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.

3.5 Soil Laboratory Test Results

Selected soil samples obtained from the field investigation were tested for grain size distribution with hydrometer, Atterberg limits, and natural moisture content. A summary of soil laboratory test results is presented in the table below, and the results of natural moisture content tests are presented on the test boring logs in Appendix A.

Test Boring No.	Depth (ft)	Sample Type	Stratum	Description of Soil Specimen	Sieve Results		Atterberg Limits			Natural Moisture Content (%)
					Percent Retained #4 Sieve	Percent Passing #200 Sieve	LL	PL	PI	
B-1	4.0-6.0	Jar	B1	gravelly FAT CLAY (CH)	18.8	67.0	56	24	32	24.1
B-3	2.0-4.0	Jar	B1	LEAN CLAY with sand (CL)	1.1	81.1	46	20	26	32.3
B-5	2.0-4.0	Jar	B1	sandy ELASTIC SILT with gravel (MH)	15.0	56.3	51	29	22	30.9
B-5	6.0-8.0	Jar	B2	clayey SAND with gravel (SC)	30.7	18.1	N/T	N/T	N/T	N/T

Notes:

1. Soil tests are in accordance with applicable ASTM standards
2. Soil classification symbols are in accordance with Unified Soil Classification System
3. Visual identification of samples is in accordance with ASTM D-2488
4. Key to abbreviations: LL = liquid limit; PL = plastic limit; PI = plasticity index; N/T = not tested

3.6 Seismic Site Classification

Based on the results of the subsurface investigation and our knowledge of local geologic conditions, the site soils have been assigned to a Site Class C per the International Building Code (IBC).

4.0 Engineering Analysis

Recommendations regarding flood wall design, temporary construction dewatering, earthwork, and rock excavation are presented herein.

4.1 Flood Wall Design Recommendations

Based on the results of our field investigation, soil laboratory testing, and engineering analysis of the geotechnical data, we have considered two typical sections for the proposed flood wall. Section 1 has been considered for areas of the flood wall located greater than 50 feet from Tuscarora Creek. Section 2 has been considered for areas of the flood wall located less than 50 feet from Tuscarora Creek, near the northeast limits of the flood wall, to address potential scour concerns.

Preliminary flood wall design was performed in general accordance with FEMA P-259, *Engineering Principles and Practices for Retrofitting Flood-Prone Residential Structures* (2012). Figure F5-15 of Appendix C provides a summary of the pressure distributions and geometry used for the flood wall design. Hydrostatic flood loads only were considered for design as instructed by AMEC structural engineers, with impact, velocity, and hydrodynamic forces being neglected.

Additionally, for Section 2, retaining wall calculations were performed to check stability of the wall for the case where hydrostatic water pressure is not present along the creek side of the wall, and no soil is present above the footing on the creek side of the wall. Retaining wall design was performed in general accordance with *Retaining Wall Stability 2.05, Computation Sheet and Workbook Documentation* (2002), by the Center for Geotechnical Practice and Research, Virginia Polytechnic Institute and State University. Therefore, Section 2 was designed using both flood wall and retaining wall methodologies. Calculations for flood wall and retaining wall designs are included in Appendix C. Design calculations and flood wall geometry presented herein should be considered preliminary and not a final design.

4.1.1 Soil Design Parameters

We recommend the following soil design parameters be used for this project:

Stratum	Total Unit Weight (pcf)	Angle of Internal Friction (degrees)	Lateral Earth Pressure Coefficients			Coefficient of Sliding Friction
			Active (K_a)	At-Rest (K_o)	Passive (K_p)	
B1 (soil)	110	25	0.41	0.58	2.5	0.35
B2 (weathered rock)	120	30	0.33	0.50	3.0	0.45

4.1.2 Spread Footings

Based on the subsurface investigation data, spread footings may be used for support of the proposed flood wall, and may be designed with a net allowable soil bearing pressure as shown in the following table.

Flood Wall Section	Applicable Test Boring Locations	Recommended Depth to Bottom of Footing Excavation Below Existing Site Grade (ft)	Net Allowable Bearing Pressure at Bottom of Footing (psf)	Bearing Stratum
Section 1A	B-1 and B-2	6.0	1,000	Residual Soil (Stratum B1)

Flood Wall Section	Applicable Test Boring Locations	Recommended Depth to Bottom of Footing Excavation Below Existing Site Grade (ft)	Net Allowable Bearing Pressure at Bottom of Footing (psf)	Bearing Stratum
Section 1B	B-3 and B-4	4.0	4,000	Weathered Rock (Stratum B2)
Section 2	B-5	9.0	6,000	Diabase Rock

The following table provides a summary of the geometry of the flood wall sections considered in our preliminary design. Symbols and descriptions match those in Figure 5F-15 of Appendix C.

Flood Wall Section	Section 1A	Section 1B	Section 2
Wall Height, H (ft)	6.0	6.0	10.0
Height of Soil on Wet Side of Wall, D_h (ft)	3.0	3.0	0
Height of Soil on Dry Side of Wall, D_t (ft)	3.0	3.0	10.0
Thickness of Footing, t_{ftg} (ft)	1.0 *	1.0	1.0
Thickness of Wall, t_{wall} (ft)	1.0	1.0	1.0
Width of Footing on Wet Side of Wall, A_h (ft)	3.0	3.0	2.0
Width of Footing on Dry Side of Wall, C (ft)	3.0	3.0	5.0
Width of Footing Total, B (ft)	7.0	7.0	8.0
Depth of Undercut and Replace with Flowable Backfill, t_{fb} (ft)	2.0 *	0	0
Depth of Footing Into Rock (ft)	0	0	1.0 #
Depth of Shear Key Below Bottom of Footing into Rock (ft)	0	0	1.0 #

Notes: * These values are combined for thickness of footing for Section 1A in Flood Wall Calculations in Appendix C, assuming a structural connection between concrete footing and flowable backfill. The depth of undercut and replacement with flowable backfill may be reduced at locations where rock or weathered rock is encountered in the excavation.

Values may be reduced to zero if embedment into rock and shear key are replaced by grouted or epoxy-bonded rock anchors of equal or greater shear capacity (factored load as appropriate, for the value of T (shear load on the footing, in lb/ft) provided in Retaining Wall Design Calculations – Section 2 of Appendix C).

Flowable backfill should conform to VDOT Special Provision S302G02-0610 for Flowable Backfill. Figure 2 illustrates the flowable backfill undercut detail.

It should be expected that the actual bearing pressures encountered in the field may vary from the design values presented herein. In order to achieve the design bearing pressure, lowering or undercutting of specific footings may be required. It is critical that all footing subgrades be observed and approved for the appropriate bearing pressure by the geotechnical engineer, prior to placement of flowable fill, steel reinforcement, or concrete.

Continuous wall footings should be at least 18 inches wide for local or punching shear considerations. A maximum slope of one horizontal to one vertical (1H:1V) should be maintained between the bottom edges of adjacent footings. Fill material and compaction requirements are presented in Section 4.3 of this report. Exterior footing subgrades should be located at least 2.5 feet below final exterior grades for frost considerations, except where expansive fat clay or elastic silt soils of Stratum B1 are present at footing subgrades, footings should be lowered to a depth of 6 feet below final grade per Loudoun County requirements or until the fat clay or elastic silt material is no longer present, whichever is less. The definition of expansive soil material is specified in Section 1803.5.3 of IBC 2012 (exhibiting an expansion index greater than 20 as determined by ASTM D-4829, OR, plasticity index greater than 15, 10% passing the no. 200 sieve, and 10% less than 5 micrometers). Settlement of spread footings should not exceed about 1-inch, and differential settlement between adjacent foundation elements should not exceed about one-half this amount, including not exceeding an angular distortion of 0.002 inch/inch along continuous wall footings.

Footing subgrades should be observed and approved by the Geotechnical Engineer of Record or his/her representative prior to placement of flowable backfill or concrete, to ascertain that footings are placed on suitable bearing soils as recommended herein. Footings should be excavated and flowable backfill or concrete placed the same day in order to avoid disturbance from water or weather. Disturbance of footing subgrades by exposure to water seepage or weather conditions should be avoided. Any existing fill, disturbed, frozen, or soft subgrade soils should be removed prior to placing footing concrete. It may be desirable to place a 3- to 4-inch thick "mud mat" of lean concrete immediately on the approved footing subgrade to avoid softening of the exposed subgrade. Forms may be used if necessary, but less subgrade disturbance is anticipated if excavations are made to the required dimensions and concrete placed against the soil. If footings are formed, the forms should be removed and the excavation backfilled as soon as possible. Water should not be allowed to pond along the outside of footings for long periods of time.

4.1.3 Flood Wall acting as Retaining Wall

Where the flood wall acts as a site retaining wall (e.g. Section 2), it should be designed to withstand lateral earth pressures using an equivalent fluid pressures of $45H$ (psf), where H refers to the height of the wall in feet. The design should account for any surcharge loads within a 45 degree slope from the base of the wall. Retaining walls may be designed to include a passive equivalent fluid pressure of $270 D$ (psf) within Stratum B1 and $360 D$ within Stratum B2, where D represents the depth of wall embedment below the exposed wall face in feet. The upper 1.5 feet of soil at the base of retaining walls should not be included in the design of passive soil resistance.

Hydrostatic pressures should not be included in the lateral earth pressure diagram assuming the use of relatively granular or free draining backfill, and perimeter subdrainage (weepholes) at the base of flood wall Section 2. Check valves may be desired in the floodwall design as described in FEMA P-259, Section 5F.1.3.2 Drainage Systems, to prevent flood water from transmitting through the retaining wall drainage system and to prevent surface water drainage from ponding upslope of the flood wall, as determined by the flood wall designer. Perimeter subdrainage is not recommended for flood wall Section 1 as long as final grades are maintained at equal elevations along both sides of the flood wall. Recommended subdrainage for site retaining walls are presented on Figure 3 at the end of this report. Recommendations for backfill against walls below grade are presented in Section 4.3 of this report.

4.2 Temporary Construction Dewatering

As shown in the table above, groundwater was encountered at depths of about 5 to 6 feet below the existing ground surface, or at about EL 291. Based on the groundwater data, we recommend that the contractor be prepared to provide temporary dewatering during construction if groundwater is present during excavations for foundations. We recommend that the dewatering consist of both an aggressive system of individual sumps and pumps during excavation. To help maintain bottom stability of excavations, groundwater levels should be drawn-down a minimum of 3 feet below the lowest portion of the excavation.

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 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 temporary dewatering system should remain in place until the floor slab subgrades are approved and the permanent underfloor subdrainage system is installed and operational.

As an alternate to temporary construction dewatering, flowable backfill may be placed through water by tremie methods, as long as excavation stability can be maintained and subgrade can be observed and approved by a geotechnical engineer prior to placement of flowable backfill. Water displaced by tremie placement of flowable backfill should be allowed to naturally drain from the excavation or be dewatered from the excavation if natural drainage does not occur within a reasonable period of time (e.g. 24 hours after flowable backfill placement).

4.3 Earthwork

Fill will be required for site grading in the proposed flood wall area and as backfill against walls below grade. The areas to be filled should be cleared and grubbed prior to placing fill. Unsuitable existing fill, soft or loose natural soils, organic material, and rubble should be stripped to approved subgrades as determined by the geotechnical engineer. Topsoil depths presented on the boring logs should not be considered as stripping depths, as topsoil depths may vary widely across the site, particularly in wooded or previously cultivated areas. Stripping depths will probably extend to greater depths than the topsoil depths indicated herein due to the presence of minor amounts of organics, roots, and other surficial materials that will require removal as a part of the stripping operations. In addition, seasonal soil moisture variations can affect stripping depths. In general, less stripping may occur during summer months when drier weather conditions can be expected. It is noted from the test borings that the upper 1 to 1.5 feet of soils are relatively soft. The depth of required stripping should be determined prior to construction by the excavation contractor using test pits, probes, or other means that the contractor wishes to employ, and this determination should be the responsibility of the excavation contractor. All subgrades should be proofrolled with a minimum 20 ton, loaded dump truck or suitable rubber tire construction equipment approved by the geotechnical engineer, prior to the placement of new fill.

There may be some areas of deeper subcutting for removal of soft wet soils. Actual undercutting requirements may also depend on groundwater conditions in the lower elevations at the time of construction. In some cases, soil stabilization/improvement methods such as the use of geogrids/geotextiles may be an economically beneficial option to the traditional removal and replacement option. Alternatively, it may be feasible to leave the residual soils in place and stabilize them by tracking crushed stone into the soft subgrade, until the subgrade is firm and unyielding during proofrolling. This can be accomplished by end dumping well graded, durable, rock fragments onto the residual soils, and spreading and tracking the rock into the alluvium. Prior to stabilization, it is essential that groundwater be pumped out from the residual soil profile, and kept out with continuous pumping during stabilization.

Fill material should be placed in lifts not exceeding 8 inches loose thickness, with fill materials compacted by hand operated tampers or light compaction equipment placed in maximum 4-inch thick loose lifts. Fill should be compacted at +/- 2% of the optimum moisture content to at least 95 percent of the maximum dry density per ASTM D-698. The upper 6 inches of pavement subgrades should be compacted to at least 100 percent of the maximum dry density per the same standard.

Materials used for compacted fill should consist of soils classifying SC, SM, SP, SW, GC, GM, GP, or GW per ASTM D-2487, with a maximum dry density greater than 105 pcf, and a liquid limit and plasticity index less than 45 and 20, respectively. It is expected that portions of soils excavated at the site will be suitable for re-use as fill based on classification. However, drying of excavated soils by spreading and aerating may be necessary to obtain proper compaction. This may not be practical during the wet period of the year. Accordingly, earthwork operations should be planned for early Spring through late Fall, when drier weather

conditions can be expected. Individual borrow areas, both from on-site and off-site sources, should be sampled and tested to verify classification of materials prior to their use as fill.

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, sheepfoot 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 walls below grade 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.

For utility excavation backfill, we recommend that open graded stone be used to backfill the pipe trench to the spring line of the pipe. Backfill should be compacted in lifts not exceeding 6 inches loose thickness, to at least 95 percent of the maximum dry density per ASTM D-698. Hand operated compaction equipment should be used until the backfill has reached a level 1 foot above the top of the pipe to prevent damaging the pipe. Also, backfill material within 2 feet of the top of the pipe should not contain rock fragments or gravel greater than 1-inch in diameter.

After completion of compacted fill operations, construction of foundation elements should begin immediately, 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 development 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. Alternatively, a budget should be established for reworking of the upper 1 to 2 feet of previously placed compacted fill.

4.4 Rock Excavation

The majority of excavations to reach proposed subgrades should generally be feasible using normal earth moving equipment; however, rock excavation methods such as hoe-ramming or blasting may be required for some of the site development. The elevations where rock excavation methods may be required for removal of bedrock at the test boring locations are estimated as follows, and are based on materials equal to or harder than an SPT resistance of 50/3”:

Test Boring No.	Estimated Elevation Where Rock Excavation Methods May be Required
B-2	EL 287
B-3	EL 291
B-4	EL 285
B-5	EL 289

The elevations given above are based upon the use of normal earth excavation equipment including up to a Caterpillar 330 hydraulic backhoe or equivalent, for mass excavation. Project specifications should include the following as a definition of rock excavation for mass excavation: “Rock is defined as any material which cannot be dislodged by a Caterpillar 330 hydraulic backhoe, or equivalent, without the use of hoe-ramming or blasting. This classification does not include material such as loose rock, concrete or other materials that can be removed by means other than hoe-ramming or blasting, but which for reasons of economy in excavating, the contractor chooses to remove by hoe-ramming or blasting.” Variations in rock conditions

should be expected from the elevations presented in the table above, since the rock surface can vary over the site. Also, the extent of rock excavation will depend on Contractor's methods, rock jointing, and rock foliation/bedding.

Any pre-blasting of utility lines should be carefully planned and executed to avoid over shooting of rock. Over shooting may result in separation along bedding planes and uplift of the rock. Over time, the blast loosened rock may collapse resulting in possible localized settlements. Additionally, water that penetrates the overblasted zone will cause the rock to slake and degrade over time, creating the potential for additional localized settlement. All overblasted material should be completely removed.

Requirements for blasting rock should be determined by a contractor with demonstrated experience in this work. Consideration must be given to vibrations transmitted to nearby buildings in determining the size of charges that may be detonated at one time. The specifications should require the taking of seismograph readings at adjacent structures to develop a blast plan that produces an acceptable level of vibrations. Each blast should be contained or covered to minimize air blast and flyrock. A precondition survey of nearby structures should be made prior to the start of construction to document the existing conditions.

5.0 General Limitations

Recommendations contained in this report are based upon the data obtained from the relatively limited number of test borings. This report does not reflect conditions that may occur between the points investigated, or between sampling intervals in test borings. The nature and extent of variations between test borings and sampling intervals may not become evident until the course of construction. Therefore, it is essential that on-site observations of subgrade conditions be performed during the construction period to determine if re-evaluation of the recommendations in this report must be made. It is critical to the successful completion of this project that GeoConcepts be retained during construction to observe the implementation of the recommendations provided herein.

This report has been prepared to aid in the evaluation of the site and to assist your office and the design professionals in the design of this project. It is intended for use with regard to the specific project as described herein. Changes in proposed construction, grading plans, etc. should be brought to our attention so that we may determine any effect on the recommendations presented herein.

An allowance should be established for additional costs that may be required for foundation and earthwork construction as recommended in this report. Additional costs may be incurred for various reasons including wet fill materials, soft subgrade conditions, unexpected groundwater problems, rock excavation, etc.

This report should be made available to bidders prior to submitting their proposals to supply them with facts relative to the subsurface conditions revealed by our investigation and the results of analyses and studies that have been performed for this project. In addition, this report should be given to the successful contractor and subcontractors for their information only.

We recommend the project specifications contain the following statement: "A geotechnical engineering report has been prepared for this project by GeoConcepts Engineering, Inc. This report is for informational purposes only and should not be considered part of the contract documents. The opinions expressed in this report are those of the geotechnical engineer and represent their interpretation of the subsoil conditions, tests and results of analyses that they performed. Should the data contained in this report not be adequate for the contractor's purposes, the contractor may make their own investigations, tests and analyses prior to bidding."

This report was prepared in accordance with generally accepted geotechnical engineering practices. No warranties, expressed or implied, are made as to the professional services included in this report.

We appreciate the opportunity to be of service for this project. Please contact the undersigned if you require clarification of any aspect of this report.

Sincerely,

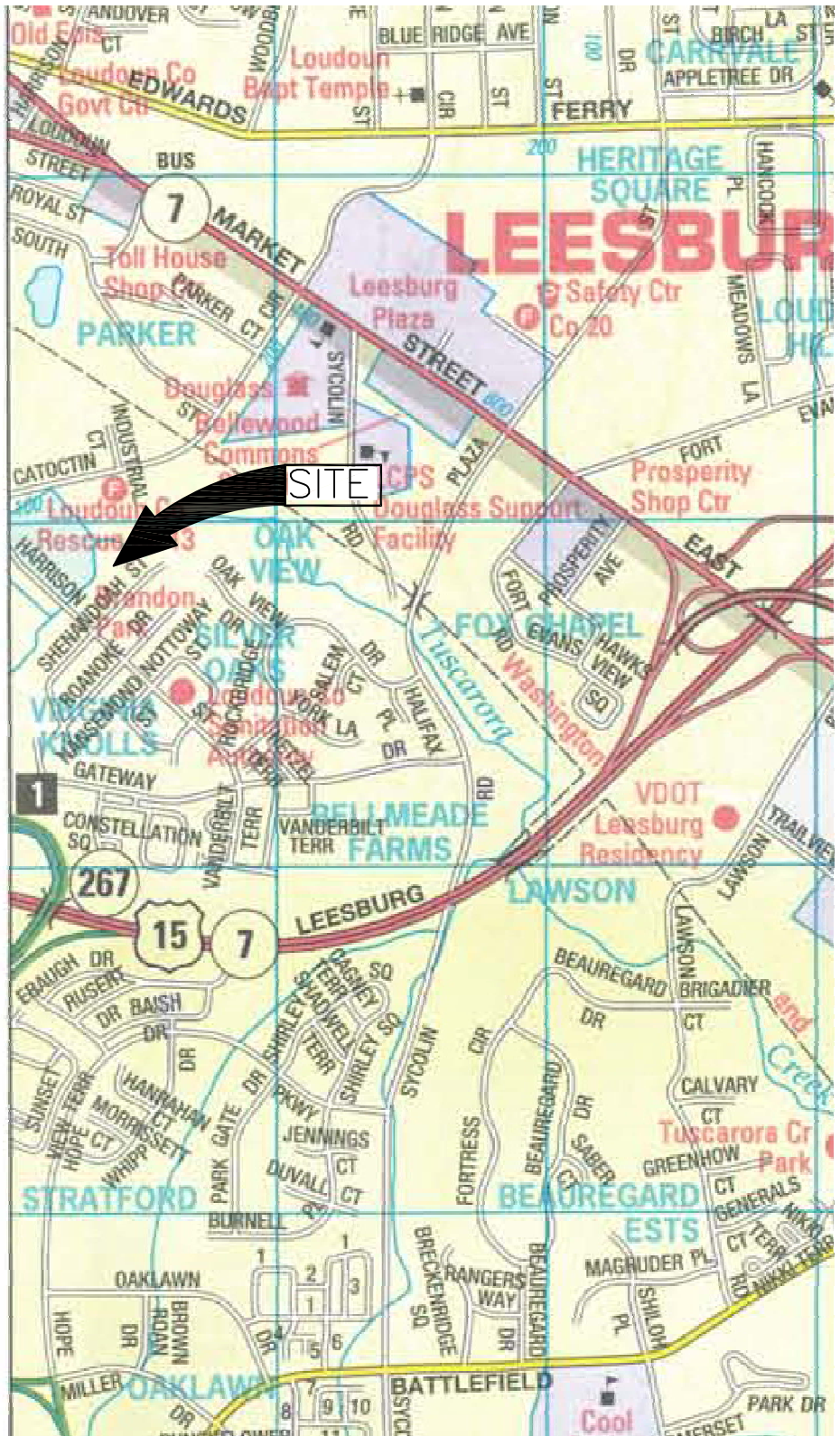
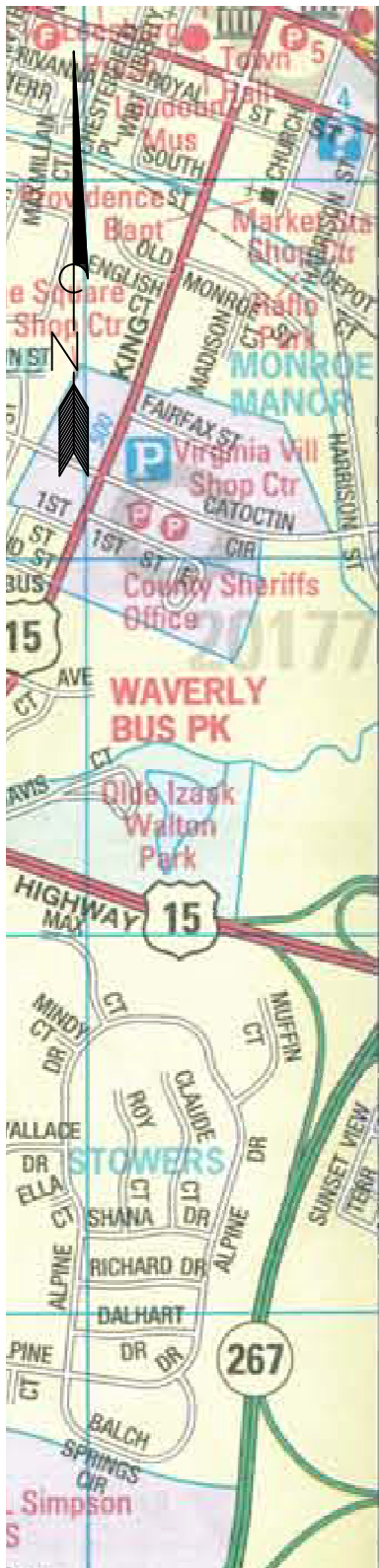
GEOCONCEPTS ENGINEERING, INC.

Tadeusz (Ted) W. Lewis, P.E.
Principal



CL/PEB/shm

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**GeoConcepts
Engineering, Inc.**

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Ashburn, Virginia 20147 (703) 726-8032 fax

TUSCARORA CREEK FLOOD MITIGATION
570 HARRISON STREET SE, LEESBURG, VA 20175

SITE
VICINITY MAP

Scale:
N.T.S.

Fig.

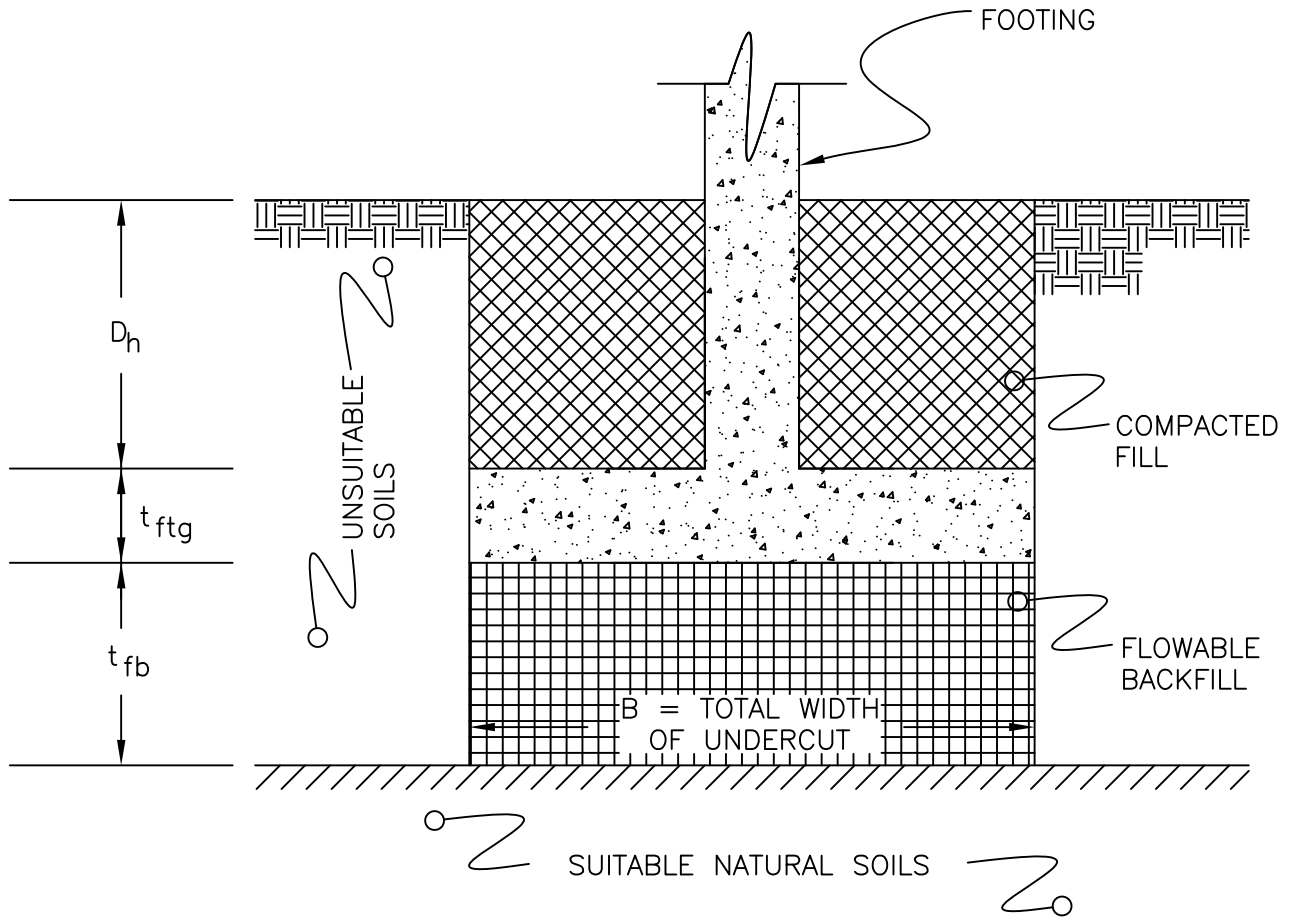
Date:
JAN. 2016

Drawn By:
C.M.L.

Checked By:
P.E.B.

Project No.:
15265

1



NOTES:

AREA UNDERCUT SHOULD BE BACKFILLED WITH FLOWABLE FILL FOLLOWING VDOT SPECIFICATIONS. FOOTING SHALL BE CONNECTED TO FLOWABLE FILL BY STEEL SHEAR CONNECTIONS OR A SHEAR KEY TO PROVIDE SUFFICIENT INTERFACE SHEAR STRENGTH TO ACCOMMODATE LATERAL LOADS PROVIDED IN FLOOD WALL CALCULATIONS.

AS AN ALTERNATIVE, THE FOOTING MAY BE LOWERED TO THE REQUIRED DEPTH TO SUITABLE NATURAL SOILS.



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TUSCARORA CREEK FLOOD MITIGATION
570 HARRISON STREET SE, LEESBURG, VA 20175

FOOTING UNDERCUT DETAIL
FLOOD WALL SECTION 1A

Scale:
N.T.S

Fig.

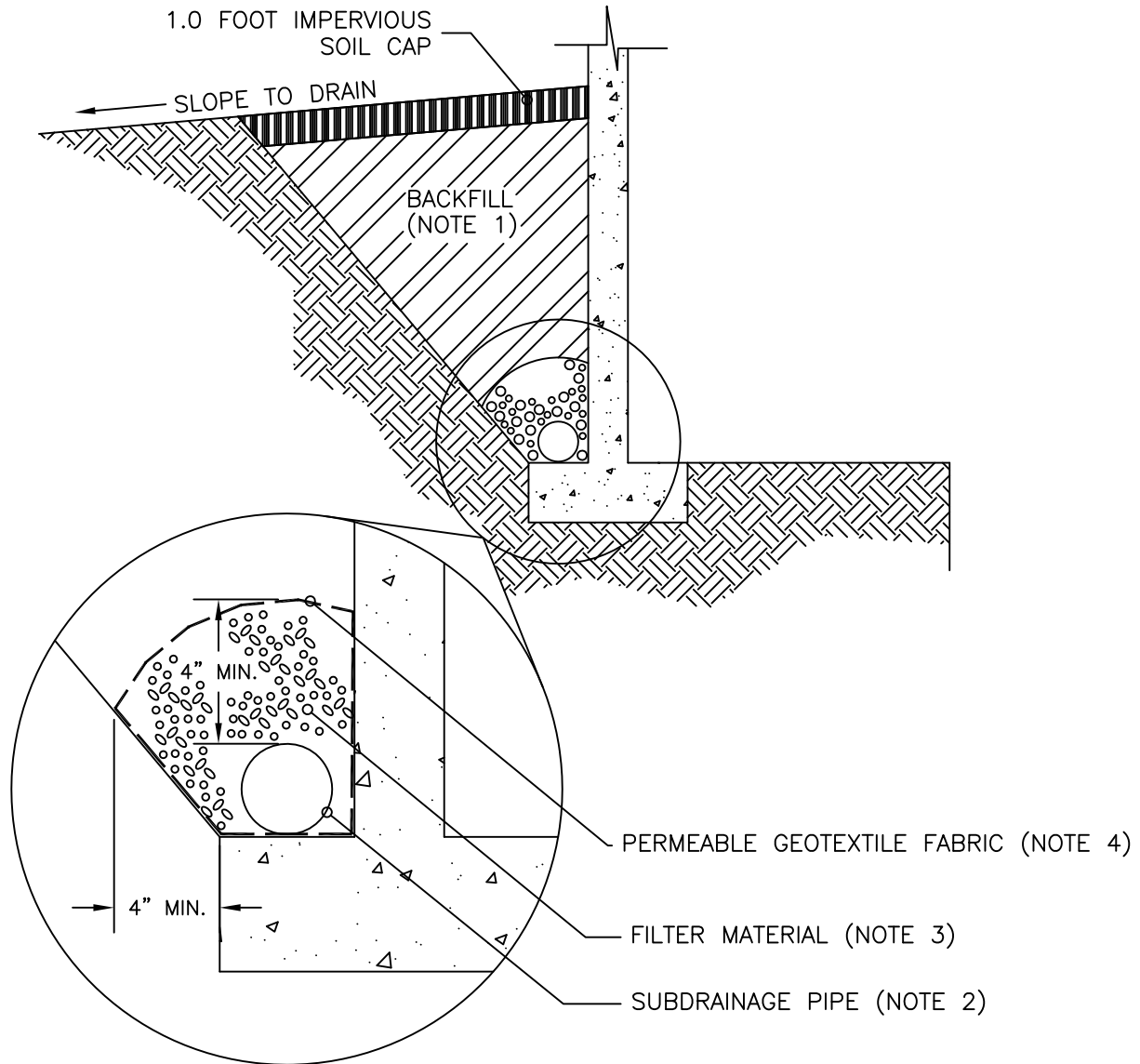
Date:
JAN. 2016

Drawn By:
C.M.L.

Checked By:
P.E.B.

Project No.:
15265

2



NOTES:

- 1) BACKFILL SHOULD CONSIST OF MATERIAL CLASSIFIED SC, SM, SP, SW, GM, GP, OR GW PER ASTM D-2487. THE LIQUID LIMIT AND PLASTICITY INDEX OF THE BACKFILL MATERIAL SHOULD NOT EXCEED 45 AND 20, RESPECTIVELY.
- 2) SUBDRAINAGE PIPING SHOULD BE 4" DIA. SLOTTED CORRUGATED POLYETHYLENE (PE) TUBING ACCORDING TO ASTM F-405 WITH 1/8 INCH SLOT WIDTH. PIPING SHOULD CONNECT TO A SUMP FOR DISPOSAL OR TO A SUITABLE GRAVITY OUTLET.
- 3) FILTER MATERIAL SHOULD SATISFY REQUIREMENTS FOR AASHTO NO. 7.
- 4) PERMEABLE GEOTEXTILE FABRIC SHOULD HAVE AN APPARENT OPENING SIZE NOT GREATER THAN THE U.S. STANDARD NO 70 SIEVE.
- 5) WASHED GRAVEL OR CRUSHED STONE SHOULD SATISFY GRADATION REQUIREMENTS FOR AASHTO NO. 57.



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TUSCARORA CREEK FLOOD MITIGATION
570 HARRISON STREET SE, LEESBURG, VA 20175

SUBDRAINAGE DETAILS
FLOOD WALL SECTION 2

Scale:
N.T.S.

Fig.

Date:
JAN. 2016

Drawn By:
C.M.L.

Checked By:
P.E.B.

Project No.:
15265

3

Appendix A

Subsurface Investigation

Subsurface Investigation Procedures (1 page)

Identification of Soil (1 page)

Test Boring Notes (1 page)

Test Boring Logs (5 pages)

Boring Location Plan, Figure 4 (1 page)

Subsurface Investigation Procedures

1. Test Borings – Hollow Stem Augers

The borings are advanced by turning an auger with a center opening of 2-¼ inches. A plug device blocks off the center opening while augers are advanced. Cuttings are brought to the surface by the auger flights. Sampling is performed through the center opening in the hollow stem auger, by standard methods, after removal of the plug. Usually, no water is introduced into the boring using this procedure.

2. Standard Penetration Tests

Standard penetration tests are performed by driving a 2-inch O.D., 1-¾ inch I.D. sampling spoon with a 140-pound hammer falling 30 inches, according to ASTM D-1586. After an initial 6 inches penetration to assure the sampling spoon is in undisturbed material, the number of blows required to drive the sampler an additional 12 inches is generally taken as the N value. In the event 30 or more blows are required to drive the sampling spoon the initial 6-inch interval, the sampling spoon is driven to a total penetration resistance of 100 blows or 18 inches, whichever occurs first.

3. Test Boring Stakeout

The test boring stakeout was provided by GeoConcepts personnel using available site plans. Ground surface elevations were estimated from topographic information contained on the site plan provided to us and should be considered approximate. If the risk related to using approximate boring locations and elevations is unacceptable, we recommend an as-drilled survey of boring locations and elevations be completed by a licensed surveyor.

Identification of Soil

I. DEFINITION OF SOIL GROUP NAMES		ASTM D-2487	Symbol	Group Name
Coarse-Grained Soils More than 50% retained on No. 200 sieve	Gravels More than 50% of coarse fraction retained on No. 4 sieve	Clean Gravels Less than 5% fines	<i>GW</i>	WELL GRADED GRAVEL
			<i>GP</i>	POORLY GRADED GRAVEL
		Gravels with Fines More than 12% fines	<i>GM</i>	silty GRAVEL
			<i>GC</i>	clayey GRAVEL
	Sands 50% or more of coarse fraction passes No. 4 sieve	Clean Sands Less than 5% fines	<i>SW</i>	WELL GRADED SAND
			<i>SP</i>	POORLY GRADED SAND
		Sands with fines More than 12% fines	<i>SM</i>	silty SAND
			<i>SC</i>	clayey SAND
Fine-Grained Soils 50% or more passes the No. 200 sieve	Silts and Clays Liquid Limit less than 50	Inorganic	<i>CL</i>	LEAN CLAY
			<i>ML</i>	SILT
		Organic	<i>OL</i>	ORGANIC CLAY
				ORGANIC SILT
	Silts and Clays Liquid Limit 50 or more	Inorganic	<i>CH</i>	FAT CLAY
			<i>MH</i>	ELASTIC SILT
		Organic	<i>OH</i>	ORGANIC CLAY
				ORGANIC SILT
Highly Organic Soils	Primarily organic matter, dark in color, and organic odor	<i>PT</i>	PEAT	

II. DEFINITION OF MINOR COMPONENT PROPORTIONS

<u>Minor Component</u>	<u>Approximate Percentage of Fraction by Weight</u>
Gravelly, Sandy (adjective)	30% or more coarse grained
Sand, Gravel	15% to 29% coarse grained
Silt, Clay	5% to 12% fine grained

III. GLOSSARY OF MISCELLANEOUS TERMS

SYMBOLS	Unified Soil Classification Symbols are shown above as group symbols. Use "A" Line Chart for laboratory identification. Dual symbols are used for borderline classification.
BOULDERS & COBBLES	Boulders are considered pieces of rock larger than 12 inches, while cobbles range from 3 to 12 inches.
WEATHERED ROCK	Residual rock material with a standard penetration test (SPT) resistance of at least 60 blows per foot.
ROCK/SPOON REFUSAL	Rock material with a standard penetration test (SPT) resistance of 50 blows for 1 inch.
ROCK FRAGMENTS	Angular pieces of rock which have separated from original vein or strata and are present in a soil matrix. Only used in residual soils
QUARTZ	A hard silicate mineral often found in residual soils. Only used when describing residual soils.
CEMENTED SAND	Usually localized rock-like deposits within a soil stratum composed of sand grains cemented by calcium carbonate, iron oxide, or other minerals. Commonly encountered in Coastal Plain sediments, primarily in the Potomac Group sands (Kps).
MICACEOUS	A term used to describe soil that "glitters" or is shiny. Most commonly encountered in fine-grained soils.
ORGANIC MATERIALS (Excluding Peat)	Topsoil - Surface soils that support plant life and contain organic matter.
FILL	Lignite - Hard, brittle decomposed organic matter with low fixed carbon content (a low grade of coal).
CONTAINS	Man-made deposit containing soil, rock, and other foreign matter.
WITH	This is used when a fill deposit contains a secondary component that does not apply to a USCS classification. Only used for fill deposits
PROBABLE FILL LAYERS	This is used when a residual soil contains a secondary component that does not contribute to its USCS classification. Only used for natural soils.
COLOR	Soils which contain no visually detected foreign matter but which are suspect with regard to origin.
MOISTURE CONDITIONS	1/2 to 12 inch seam of minor soil component.
f-m-c	Two most predominant colors present should be described.
	Wet, moist, or dry to indicate visual appearance of specimen.
	Fine-medium-coarse

Test Boring Notes

1. Classification of soil is by visual inspection and is in accordance with the Unified Soil Classification System.
2. Estimated groundwater levels are indicated on the logs. These are only estimates from available data and may vary with precipitation, porosity of soil, site topography, etc.
3. Sampling data presents standard penetrations for 6-inch intervals or as indicated with graphic representations adjacent to the sampling data. Where undisturbed tube samples are taken, they are designated "Shelby Tube" on the test boring log. The column with the header of the letters "PP" stands for pocket penetrometer, which is a measure of undrained shear strength (S_u).
4. The logs and related information depict subsurface conditions at the specific locations and at the particular time when drilled. Soil conditions at other locations may differ from conditions occurring at the test locations. Also, the passage of time may result in a change in the subsurface conditions at the test locations.
5. The stratification lines represent the approximate boundary between soil types as determined in the sampling operation. Some variation may be expected vertically between samples taken. The soil profile, groundwater level observations and penetration resistances presented on the logs have been made with reasonable care and accuracy and must be considered only an approximate representation of subsurface conditions to be encountered at the particular location.
6. Weathered rock is defined as residual earth material with a penetration resistance between 60 blows per foot and refusal. Spoon refusal at the surface of rock, boulders, or obstructions is defined as a penetration resistance of 50 blows for 1 inch penetration or less. Auger refusal is taken as the depth at which further penetration of the auger is not possible without risking significant damage to the drilling equipment.



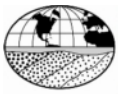
PROJECT: Tuscarora Creek Flood Mitigation		LOGGED BY: F. Madrona		BORING NUMBER: B-1	
LOCATION: Leesburg, Loudoun County, Virginia		DRILLING CONTRACTOR: Recon Drilling		SHEET 1 OF 1	
OWNER/CLIENT: AMEC		DRILLER: D. Lazaro		DATES DRILLED: 12/7/15 - 12/7/15	
PROJECT NUMBER: 15265		GROUND SURFACE ELEVATION (ft): 297.0 ±		DRILLING METHOD: Manual hammer 2.25"	
				OFFSET NOTES:	

ELEV. (ft)	DEPTH (ft)	SAMPLE TYPE	STRATUM	GRAPHIC	MATERIAL DESCRIPTION	SOIL			
						SPT BLOW COUNTS	REC (ft)	STANDARD PENETRATION TEST RESISTANCE (BPF) 20 40 60 80	MC (%)
297.0 296.8					Topsoil = 0.17ft. <i>Residual, brown, f, gravelly FAT CLAY, contains organics, soft, moist, CH</i>	2+4+4+5	18		
			B1		Contains rock fragments, stiff, without organics	4+4+6+8	21		24.1
293.0	5					4+7+9+15	20		
291.0					<i>Residual, tan, f-m, sandy LEAN CLAY, contains rock fragments, very stiff, moist, CL</i>	16+14+8+25	21		
289.0					<i>Weathered rock, tan, f-c, clayey SAND with gravel, contains rock fragments, very dense, moist, SC</i>	24+50/5	11		>>
	10		B2						
283.5					Dense	6+14+35	18		
282.0	15				Bottom of Boring at 15.0 ft				

GROUND WATER LEVELS:				SAMPLE TYPES:	
▽ ENCOUNTERED:	8.0 ft	ELEV. 289.0		☒ Split Spoon	
▽ UPON COMPLETION:	6.4 ft	ELEV. 290.6	CAVED: 9.9 ft	ELEV. 287.1	
▽ 12/7/2015	6.0 ft	ELEV. 291.0	CAVED: 9.9 ft	ELEV. 287.1	

REMARKS:

BOREHOLE/TEST PIT TUSCARORA CREEK FLOOD MITIGATION LOGS.GPJ GEOCONCEPTS TEMPLATE 02-12-2015.GDT 1/13/16



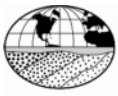
PROJECT: Tuscarora Creek Flood Mitigation		LOGGED BY: F. Madrona	BORING NUMBER: B-2
LOCATION: Leesburg, Loudoun County, Virginia		DRILLING CONTRACTOR: Recon Drilling	
OWNER/CLIENT: AMEC		DRILLER: D. Lazaro	DATES DRILLED: 12/7/15 - 12/7/15
PROJECT NUMBER: 15265	GROUND SURFACE ELEVATION (ft): 296.0	DRILLING METHOD: Manual hammer 2.25"	OFFSET NOTES:

ELEV. (ft)	DEPTH (ft)	SAMPLE TYPE	STRATUM	GRAPHIC	MATERIAL DESCRIPTION	SOIL		
						SPT BLOW COUNTS	REC (ft)	STANDARD PENETRATION TEST RESISTANCE (BPF)
								20 40 60 80
296.0 295.8					Topsoil = 0.17ft. <i>Residual, tan, f-m, sandy SILT, contains organics and quartz, firm, moist, ML</i>	3+4+4+5	16	
294.0					<i>Residual, tan, f-m, FAT CLAY with sand, contains rock fragments, very stiff, moist, CH</i>	5+7+11+11	12	
	5		B1		Hard	8+12+36+18	18	
290.0						10+12+20+40	21	
288.0			B2		<i>Weathered rock, f-c, sandy LEAN CLAY, contains rock fragments, very hard, moist, CL</i>	45+50/5	11	>>
286.0	10				Auger and Spoon Refusal at 10.0 ft	50/0	0	>>

GROUND WATER LEVELS:				SAMPLE TYPES:	
▽ ENCOUNTERED:	<u>8.0</u> ft	ELEV. <u>288.0</u>			Split Spoon
▽ UPON COMPLETION:	<u>5.5</u> ft	ELEV. <u>290.5</u>	CAVED: <u>6.0</u> ft	ELEV. <u>290.0</u>	
▽ 12/7/2015	<u>5.0</u> ft	ELEV. <u>291.0</u>	CAVED: <u>6.0</u> ft	ELEV. <u>290.0</u>	

REMARKS:

BOREHOLE/TEST PIT TUSCARORA CREEK FLOOD MITIGATION LOGS.GPJ GEOCONCEPTS TEMPLATE 02-12-2015.GDT 1/13/16



PROJECT: Tuscarora Creek Flood Mitigation		LOGGED BY: F. Madrona		BORING NUMBER: B-3	
LOCATION: Leesburg, Loudoun County, Virginia		DRILLING CONTRACTOR: Recon Drilling		SHEET 1 OF 1	
OWNER/CLIENT: AMEC		DRILLER: D. Lazaro		DATES DRILLED: 12/7/15 - 12/7/15	
PROJECT NUMBER: 15265		GROUND SURFACE ELEVATION (ft): 296.0 ±		DRILLING METHOD: Manual hammer 2.25"	
				OFFSET NOTES:	

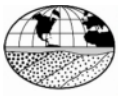
ELEV. (ft)	DEPTH (ft)	SAMPLE TYPE	STRATUM	GRAPHIC	MATERIAL DESCRIPTION	SOIL			
						SPT BLOW COUNTS	REC (in)	STANDARD PENETRATION TEST RESISTANCE (BPF) 20 40 60 80	MC (%)
296.0 295.9					Topsoil = 0.08ft. <i>Residual, brown, f, LEAN CLAY with sand, contains organics, soft, moist, CL</i>	2+2+2+2	18		
294.0			B1		Stiff	4+4+7+9	18		32.3
292.0			B2		<i>Weathered rock, brown and light gray, f-c, sandy LEAN CLAY with gravel, contains rock fragments, very hard, moist, CL</i>	8+50/5	11		>>
290.0					Auger and Spoon Refusal at 6.0 ft	50/0	0		>>

GROUND WATER LEVELS:		SAMPLE TYPES:	
NOT ENCOUNTERED DURING DRILLING		<input checked="" type="checkbox"/> Split Spoon	
NOT ENCOUNTERED UPON COMPLETION		CAVED: <u>3.4</u> ft ELEV. <u>292.6</u>	
12/7/2015: NOT ENCOUNTERED		CAVED: <u>3.2</u> ft ELEV. <u>292.8</u>	

REMARKS:

THE STRATIFICATION LINES REPRESENT APPROXIMATE BOUNDARIES. THE TRANSITION MAY BE GRADUAL.

BOREHOLE/TEST PIT TUSCARORA CREEK FLOOD MITIGATION LOGS.GPJ GEOCONCEPTS TEMPLATE 02-12-2015.GDT 1/13/16



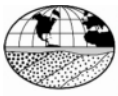
PROJECT: Tuscarora Creek Flood Mitigation		LOGGED BY: F. Madrona	BORING NUMBER: B-4
LOCATION: Leesburg, Loudoun County, Virginia		DRILLING CONTRACTOR: Recon Drilling	
OWNER/CLIENT: AMEC		DRILLER: D. Lazaro	DATES DRILLED: 12/7/15 - 12/7/15
PROJECT NUMBER: 15265	GROUND SURFACE ELEVATION (ft): 296.0 ±	DRILLING METHOD: Manual hammer 2.25"	OFFSET NOTES:

ELEV. (ft)	DEPTH (ft)	SAMPLE TYPE	STRATUM	GRAPHIC	MATERIAL DESCRIPTION	SOIL		
						SPT BLOW COUNTS	REC (ft)	STANDARD PENETRATION TEST RESISTANCE (BPF) 20 40 60 80
296.0	0				Topsoil = 0.08ft.			
295.9	0.1				<i>Residual</i> , brown, f , LEAN CLAY with sand, firm, moist, CL	3+4+4+6	12	
294.0	2.0		B1		Stiff, trace rock fragments			
292.0	4.0				<i>Weathered rock</i> , light gray, f-m , silty SAND, very dense, moist, SM	8+6+8+19	18	
290.0	6.0				F-c , trace rock fragments	33+50/4	9	>>
287.0	9.0		B2		Wet	50/6	6	>>
287.0	9.0					20+38+22+33	21	
282.5	13.5				Spoon Refusal at 13.5 ft	50/0	0	>>

GROUND WATER LEVELS:	SAMPLE TYPES:
<input type="checkbox"/> ENCOUNTERED: <u>9.0</u> ft ELEV. <u>287.0</u> NOT ENCOUNTERED UPON COMPLETION <input checked="" type="checkbox"/> 12/7/2015 <u>5.8</u> ft ELEV. <u>290.2</u>	<input checked="" type="checkbox"/> Split Spoon <input type="checkbox"/> CAVED: <u>9.8</u> ft ELEV. <u>286.2</u> <input type="checkbox"/> CAVED: <u>6.4</u> ft ELEV. <u>289.6</u>

REMARKS:

BOREHOLE/TEST PIT TUSCARORA CREEK FLOOD MITIGATION LOGS.GPJ GEOCONCEPTS TEMPLATE 02-12-2015.GDT 1/13/16



PROJECT: Tuscarora Creek Flood Mitigation		LOGGED BY: F. Madrona		BORING NUMBER: B-5	
LOCATION: Leesburg, Loudoun County, Virginia		DRILLING CONTRACTOR: Recon Drilling		SHEET 1 OF 1	
OWNER/CLIENT: AMEC		DRILLER: D. Lazaro		DATES DRILLED: 12/7/15 - 12/7/15	
PROJECT NUMBER: 15265	GROUND SURFACE ELEVATION (ft): 296.0 ±	DRILLING METHOD: Manual hammer 2.25"		OFFSET NOTES:	

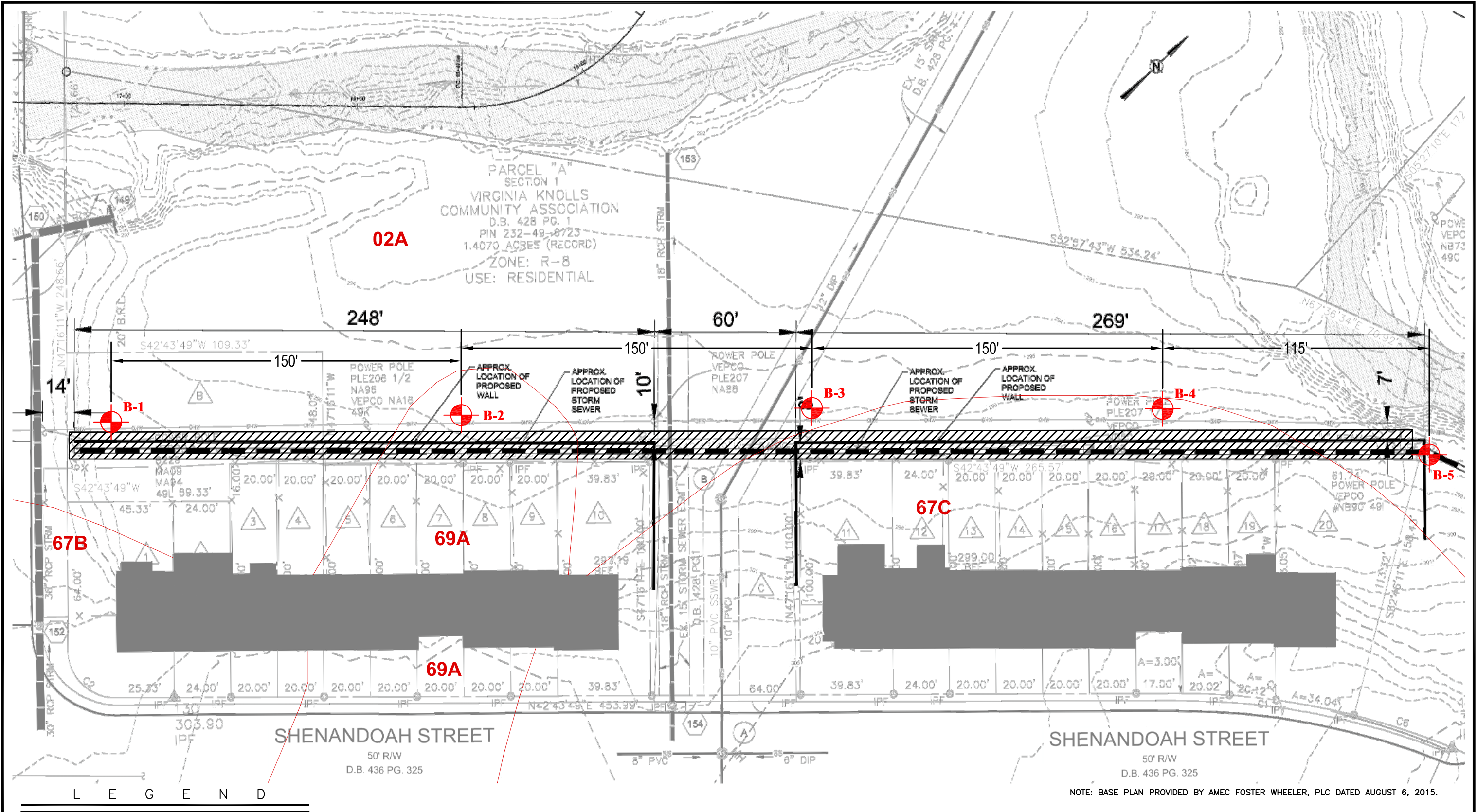
ELEV. (ft)	DEPTH (ft)	SAMPLE TYPE	STRATUM	GRAPHIC	MATERIAL DESCRIPTION	SOIL			
						SPT BLOW COUNTS	REC (in)	STANDARD PENETRATION TEST RESISTANCE (BPF) 20 40 60 80	MC (%)
296.0					Topsoil = 0.17ft.				
295.8					<i>Residual, brown, f, sandy ELASTIC SILT with gravel, firm, moist, MH</i>	4+3+4+3	12		
294.0			B1		Very stiff, trace quartz fragments	4+8+10+18	16		30.9
292.0					<i>Weathered rock, tan, f-m, sandy LEAN CLAY, hard, moist, CL</i>	50/6	5		>>
290.0	5		B2		<i>Weathered rock, tan, f-c, clayey SAND with gravel, contains rock fragments, very hard, moist, SC</i>	42+50/4	6		>>
288.0	10				Auger and Spoon Refusal at 8.0 ft	50/0	0		>>

GROUND WATER LEVELS: NOT ENCOUNTERED DURING DRILLING NOT ENCOUNTERED UPON COMPLETION	CAVED: <u>4.2</u> ft ELEV. <u>291.8</u>	SAMPLE TYPES: <input checked="" type="checkbox"/> Split Spoon
--	---	--

REMARKS:

BOREHOLE/TEST PIT TUSCARORA CREEK FLOOD MITIGATION LOGS.GPJ GEOCONCEPTS TEMPLATE 02-12-2015.GDT 1/13/16

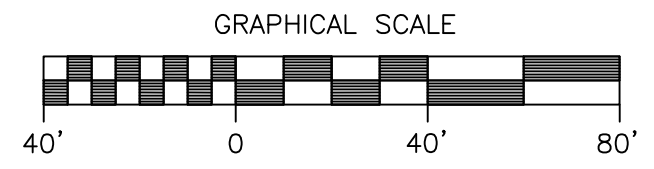
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B-1 TEST BORING LOCATION

OBSERVED HIGH DENSITY OF UNDERGROUND UTILITIES

02A SOILS MAP UNIT



GeoConcepts Engineering, Inc.

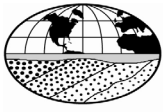
19955 Highland Vista Dr., Suite 170 (703) 726-8030
Ashburn, Virginia 20147 (703) 726-8032 fax
Page 27 of 47

TUSCARORA CREEK FLOOD MITIGATION 570 HARRISON STREET SE, LEESBURG, VA 20175				Fig. 4
BORING LOCATION PLAN			Scale: AS SHOWN	
Date: JAN. 2016	Drawn By: C.M.L.	Checked By: P.E.B.	Project No.: 15265	

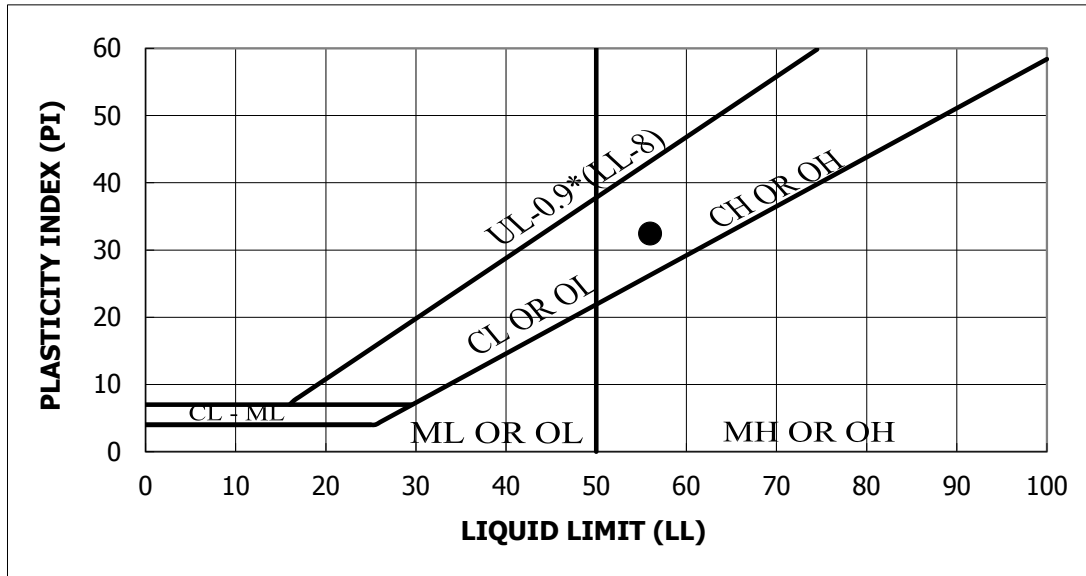
Appendix B

Soil Laboratory Test Results

Liquid and Plastic Limit, and Grain Size Analysis Test Data (7 pages)



LIQUID AND PLASTIC LIMIT - ASTM D4318			
Project No.	15265	Project Name	Tuscarora Creek Flood Mitigation
Test Boring No.	B-1	Depth (Feet)	4.0'-6.0'
Lab Order No.	3698-1	Date	12/29/2015



Material Description	LL	PL	PI	% Passing		USCS	w (%)
				#4	#200		
gravelly Fat Clay	56	24	32	81.2	67.0	CH	24.1
Color	Gray		AASHTO Classification		A-7-6		

Test Method: ASTM D 4318

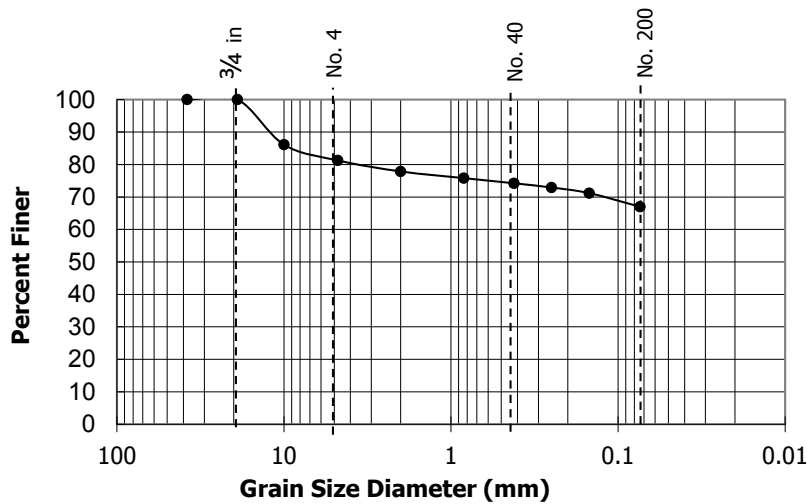
Soil Classification by ASTM D2487 and AASHTO M 145

Tested by _____

Reviewed by *Sushant*



GRAIN SIZE ANALYSIS - ASTM D422			
Project No.	15265	Project Name	Tuscarora Creek Flood Mitigation
Test Boring No.	B-1	Depth (Feet)	4.0'-6.0'
Lab Order No.	3698-1	Date	12/29/2015



SIEVE	% Passing
1 1/2 "	100
3/4"	100
3/8"	86
#4	81
#10	78
#20	76
#40	74
#60	73
#100	71
#200	67
Pan	--

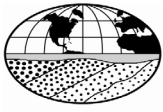
USCS Group Symbol	CH
USCS Group Name	gravelly Fat Clay
Cu	---
Cc	---
LL	56
PI	32
Gravel	18.8
Sand	14.2
Fines	67.0
AASHTO Classification	A-7-6
Color	Gray

Test Method: ASTM D 422

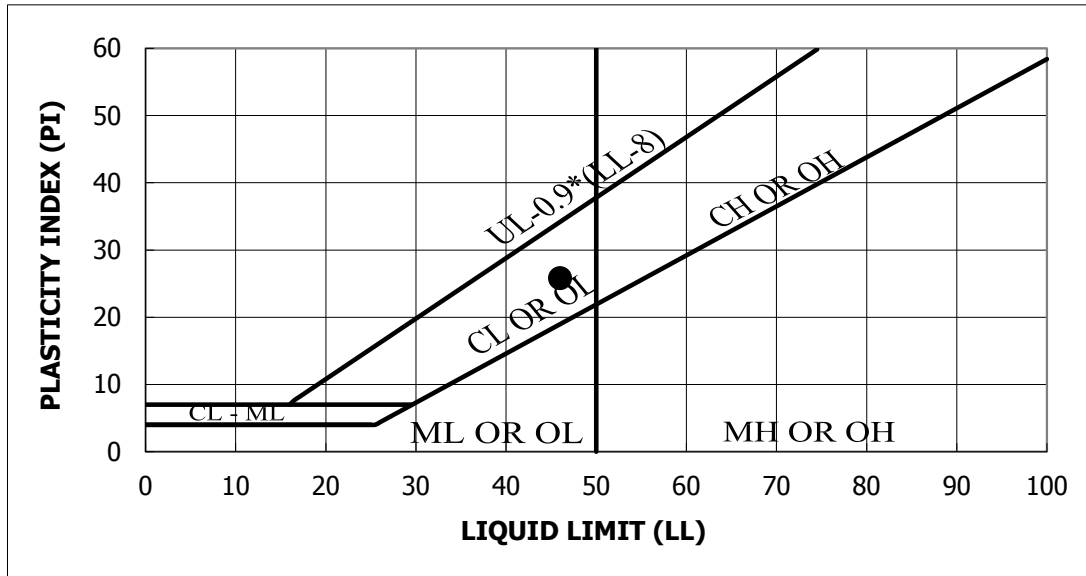
Soil Classification by ASTM D2487 and AASHTO M 145

Tested by: _____

Reviewed by: _____



LIQUID AND PLASTIC LIMIT - ASTM D4318			
Project No.	15265	Project Name	Tuscarora Creek Flood Mitigation
Test Boring No.	B-3	Depth (Feet)	2.0'-4.0'
Lab Order No.	3698-2	Date	12/29/2015



Material Description	LL	PL	PI	% Passing		USCS	w (%)
				#4	#200		
Lean Clay with sand	46	20	26	98.9	81.1	CL	32.3
Color	Brownish Gray		AASHTO Classification		A-7-6		

Test Method: ASTM D 4318

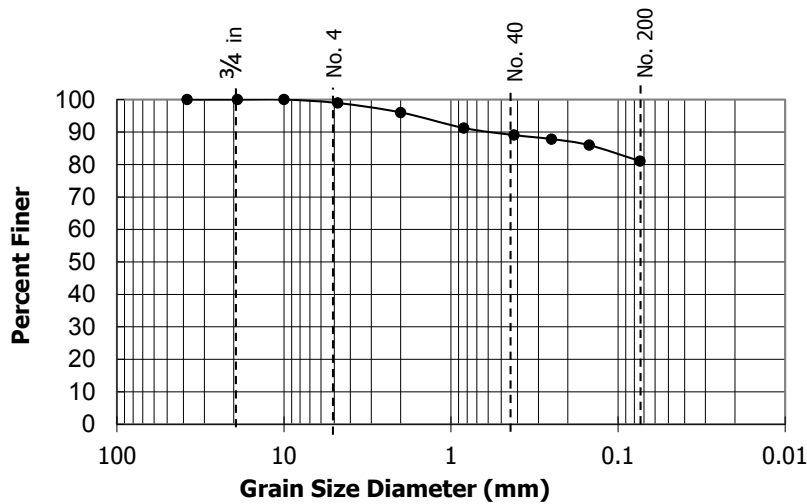
Soil Classification by ASTM D2487 and AASHTO M 145

Tested by _____

Reviewed by *J. Shant*



GRAIN SIZE ANALYSIS - ASTM D422			
Project No.	15265	Project Name	Tuscarora Creek Flood Mitigation
Test Boring No.	B-3	Depth (Feet)	2.0'-4.0'
Lab Order No.	3698-2	Date	12/29/2015



SIEVE	% Passing
1 1/2 "	100
3/4"	100
3/8"	100
#4	99
#10	96
#20	91
#40	89
#60	88
#100	86
#200	81
Pan	--

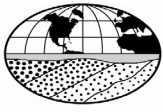
USCS Group Symbol	CL
USCS Group Name	Lean Clay with sand
Cu	---
Cc	---
LL	46
PI	26
Gravel	1.1
Sand	17.9
Fines	81.1
AASHTO Classification	A-7-6
Color	Brownish Gray

Test Method: ASTM D 422

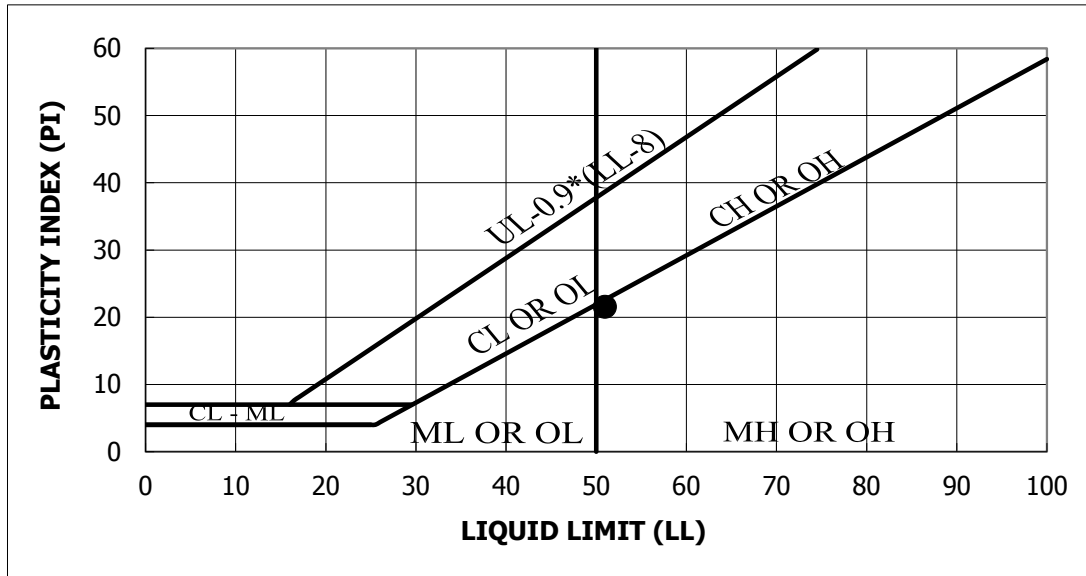
Soil Classification by ASTM D2487 and AASHTO M 145

Tested by: _____

Reviewed by: _____



LIQUID AND PLASTIC LIMIT - ASTM D4318			
Project No.	15265	Project Name	Tuscarora Creek Flood Mitigation
Test Boring No.	B-5	Depth (Feet)	2.0'-4.0'
Lab Order No.	3698-3	Date	12/29/2015



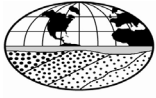
Material Description	LL	PL	PI	% Passing		USCS	w (%)
				#4	#200		
sandy Elastic Silt with gravel	51	29	22	85.0	56.3	MH	30.9
Color	Brownish Gray		AASHTO Classification		A-7-6		

Test Method: ASTM D 4318

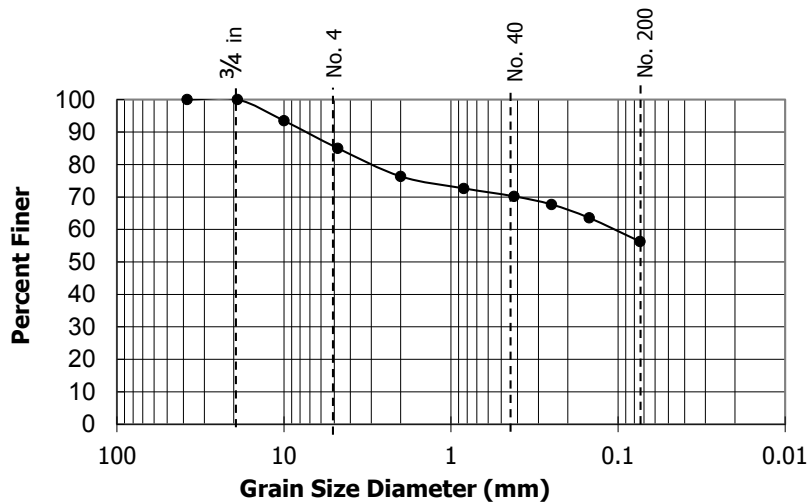
Soil Classification by ASTM D2487 and AASHTO M 145

Tested by _____

Reviewed by *J. Shant*



GRAIN SIZE ANALYSIS - ASTM D422			
Project No.	15265	Project Name	Tuscarora Creek Flood Mitigation
Test Boring No.	B-5	Depth (Feet)	2.0'-4.0'
Lab Order No.	3698-3	Date	12/29/2015



SIEVE	% Passing
1 1/2 "	100
3/4"	100
3/8"	93
#4	85
#10	76
#20	73
#40	70
#60	68
#100	64
#200	56
Pan	--

USCS Group Symbol	MH
USCS Group Name	sandy Elastic Silt with gravel
Cu	---
Cc	---
LL	51
PI	22
Gravel	15.0
Sand	28.7
Fines	56.3
AASHTO Classification	A-7-6
Color	Brownish Gray

Test Method: ASTM D 422

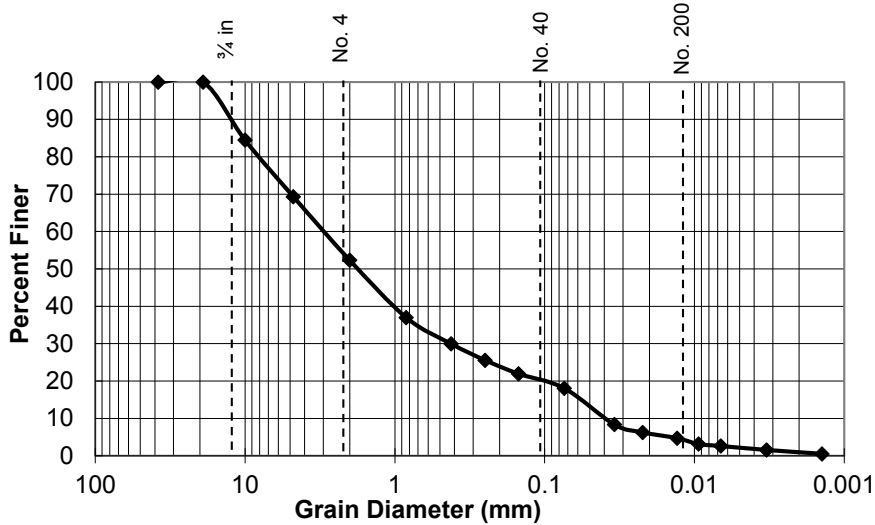
Soil Classification by ASTM D2487 and AASHTO M 145

Tested by: _____

Reviewed by: _____



HYDROMETER ANALYSIS			
Project No.	15265	Project Name	Tuscarora Creek Flood Mitigation
Test Boring No.	B-5	Depth (Feet)	6.0'-8.0'
Lab Order No.	3698-4	Date	12/29/2015



SIEVE	% Passing
1 1/2"	100.0
3/4"	100.0
3/8"	84.5
#4	69.3
#10	52.3
#40	29.9
#100	21.9
#200	18.1
Pan	--

USCS Group Symbol	---
USCS Group Name	---
Cu	---
Cc	---
LL	---
PI	---
Gravel	30.7
Sand	51.3
Silt	17.2
Clay	0.8
Fines	18.1
AASHTO Classification	---

Test Method: ASTM D 422

Soil Classification by ASTM D2487 and AASHTO M 145

Tested by _____

Reviewed by _____

Appendix C

Engineering Calculations

Flood Wall Design Calculations – Section 1A (1 page)

Flood Wall Design Calculations – Section 1B (1 page)

Flood Wall Design Calculations – Section 2 (1 page)

Flood Wall Design Equations (2 pages)

Retaining Wall Design Calculations – Section 2 (1 page)

Retaining Wall Design Equations (5 pages)

Project Name: Tuscarora Creek Flood Mitigation
Project Number: 15265
Date: 1/13/2015
Calculations By: CL
Checked By: PB

Flood Wall Design Calculations

FEMA P-259, Engineering Principles and Practices for Retrofitting Flood-Prone Residential Structures (2012)

Flood Wall Section 1A

	Bearing Layer Description	Soil
Table 5F-1	Allowable Bearing Pressure, S_{bc} (psf)	1000
Table 5F-1	Coefficient of Friction for Sliding, C_f	0.35
	Passive Soil Pressure Coefficient, k_p	2.5
	Unit Weight of Water, γ_w (pcf)	62.4
	Unit Weight of Wall, S_g (pcf)	150
	Unit Weight of Soil, γ_{soil} (pcf)	110
Table 4-3	Equivalent Fluid Weight of Submerged Soil and Water, S (pcf)	106

	Height of Wall, H (ft)	6.0
	Height of Soil on Wet Side of Wall, D_h (ft)	3.0
	Height of Soil on Dry Side of Wall, D_t (ft)	3.0
	Thickness of Footing, t_{ftg} (ft)	3.0
	Thickness of Wall, t_{wall} (ft)	1.0
	Width of Footing on Wet Side of Wall, A_h (ft)	3.0
	Width of Footing on Dry Side of Wall, C (ft)	3.0
	Width of Footing Total, B (ft)	7.0

Eqn. 5F-1	Force1 due to Buoyancy, f_{buoy1} (lb/ft)	842.4
Eqn. 5F-1	Force2 due to Buoyancy, f_{buoy2} (lb/ft)	748.8
Eqn. 5F-2	Weight of the Wall, w_{wall} (lb/ft)	900.0
Eqn. 5F-3	Weight of the Footing, w_{ftg} (lb/ft)	3150.0
Eqn. 5F-4	Weight of Soil over the Dry Side of Wall, w_{st} (lb/ft)	990.0
Eqn. 5F-5	Weight of Soil over the Wet Side of Wall, w_{sh} (lb/ft)	428.4
Eqn. 5F-6	Weight of Water Above the Wet Side of the Wall, w_{wh} (lb/ft)	561.6
Eqn. 5F-7	Total Gravity Forces Acting Downward, w_g (lb/ft)	6030.0
Eqn. 5F-8	Net Vertical Force, f_v (lb/ft)	5187.6
Eqn. 5F-9	Cumulative Lateral Hydrostatic Force acting at $H/3$, f_{comb} (lb/ft)	3312.0

Check Sliding

Eqn. 5F-10	Friction Force between Footing and Soil, f_{fr} (lb/ft)	1815.7
Eqn. 5F-11	Cohesion Force between Footing and Soil, f_c (lb/ft)	0
Eqn. 5F-12	Passive Saturated Soil Force Over the Toe, f_p (lb/ft)	3265.2
Eqn. 5F-13	Resisting Force to Sliding, f_R (lb/ft)	5080.9
Eqn. 5F-14	Factor of Safety Against Sliding, $FS_{(SL)}$	1.534

Check Overturning

Eqn. 5F-15	Sum of Overturning Moments, M_0 (ft-lbs/ft)	9440.4
Eqn. 4-4	Lateral Hydrostatic Force, F_{sta} (lb/ft)	1123.2
Eqn. 4-5	Differential Soil/Water Force, F_{dir} (lb/ft)	196.2
Eqn. 5F-16	Sum of Resisting Moments, M_R (ft-lbs/ft)	27635.4
Eqn. 5F-17	Factor of Safety Against Overturning, $FS_{(OT)}$	2.927

Determine Eccentricity

Eqn. 5F-18	Eccentricity, e (ft)	-0.01
------------	------------------------	-------

Check Soil Pressure

Eqn. 5F-19	Soil Pressure Created by Forces Acting on the Wall, q_1 (psf)	736.4
Eqn. 5F-19	Soil Pressure Created by Forces Acting on the Wall, q_2 (psf)	745.8

Project Name: Tuscarora Creek Flood Mitigation
Project Number: 15265
Date: 1/13/2015
Calculations By: CL
Checked By: PB

Flood Wall Design Calculations

FEMA P-259, Engineering Principles and Practices for Retrofitting Flood-Prone Residential Structures (2012)

Flood Wall Section 1B

	Bearing Layer Description	Weathered Rock
Table 5F-1	Allowable Bearing Pressure, S_{bc} (psf)	4000
Table 5F-1	Coefficient of Friction for Sliding, C_f	0.45
	Passive Soil Pressure Coefficient, k_p	2.5
	Unit Weight of Water, γ_w (pcf)	62.4
	Unit Weight of Wall, S_g (pcf)	150
	Unit Weight of Soil, γ_{soil} (pcf)	110
Table 4-3	Equivalent Fluid Weight of Submerged Soil and Water, S (pcf)	106

	Height of Wall, H (ft)	6.0
	Height of Soil on Wet Side of Wall, D_h (ft)	3.0
	Height of Soil on Dry Side of Wall, D_t (ft)	3.0
	Thickness of Footing, t_{ftg} (ft)	1.0
	Thickness of Wall, t_{wall} (ft)	1.0
	Width of Footing on Wet Side of Wall, A_h (ft)	3.0
	Width of Footing on Dry Side of Wall, C (ft)	3.0
	Width of Footing Total, B (ft)	7.0

Eqn. 5F-1	Force1 due to Buoyancy, f_{buoy1} (lb/ft)	405.6
Eqn. 5F-1	Force2 due to Buoyancy, f_{buoy2} (lb/ft)	312.0
Eqn. 5F-2	Weight of the Wall, w_{wall} (lb/ft)	900.0
Eqn. 5F-3	Weight of the Footing, w_{ftg} (lb/ft)	1050.0
Eqn. 5F-4	Weight of Soil over the Dry Side of Wall, w_{st} (lb/ft)	990.0
Eqn. 5F-5	Weight of Soil over the Wet Side of Wall, w_{sh} (lb/ft)	428.4
Eqn. 5F-6	Weight of Water Above the Wet Side of the Wall, w_{wh} (lb/ft)	561.6
Eqn. 5F-7	Total Gravity Forces Acting Downward, w_g (lb/ft)	3930.0
Eqn. 5F-8	Net Vertical Force, f_v (lb/ft)	3524.4
Eqn. 5F-9	Cumulative Lateral Hydrostatic Force acting at $H/3$, f_{comb} (lb/ft)	1877.6

Check Sliding

Eqn. 5F-10	Friction Force between Footing and Soil, f_{fr} (lb/ft)	1586.0
Eqn. 5F-11	Cohesion Force between Footing and Soil, f_c (lb/ft)	0
Eqn. 5F-12	Passive Saturated Soil Force Over the Toe, f_p (lb/ft)	1451.2
Eqn. 5F-13	Resisting Force to Sliding, f_R (lb/ft)	3037.2
Eqn. 5F-14	Factor of Safety Against Sliding, $FS_{(SL)}$	1.618

Check Overturning

Eqn. 5F-15	Sum of Overturning Moments, M_0 (ft-lbs/ft)	5503.2
Eqn. 4-4	Lateral Hydrostatic Force, F_{sta} (lb/ft)	1123.2
Eqn. 4-5	Differential Soil/Water Force, F_{dir} (lb/ft)	196.2
Eqn. 5F-16	Sum of Resisting Moments, M_R (ft-lbs/ft)	15689.9
Eqn. 5F-17	Factor of Safety Against Overturning, $FS_{(OT)}$	2.851

Determine Eccentricity

Eqn. 5F-18	Eccentricity, e (ft)	0.61
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Check Soil Pressure

Eqn. 5F-19	Soil Pressure Created by Forces Acting on the Wall, q_1 (psf)	766.6
Eqn. 5F-19	Soil Pressure Created by Forces Acting on the Wall, q_2 (psf)	240.4

Project Name: Tuscarora Creek Flood Mitigation
Project Number: 15265
Date: 1/13/2016
Calculations By: CL
Checked By: PB

Flood Wall Design Calculations

FEMA P-259, Engineering Principles and Practices for Retrofitting Flood-Prone Residential Structures (2012)

Flood Wall Section 2

	Bearing Layer Description	Rock
Table 5F-1	Allowable Bearing Pressure, S_{bc} (psf)	6000
Table 5F-1	Coefficient of Friction for Sliding, C_f	0.50
	Passive Soil Pressure Coefficient, k_p	2.5
	Unit Weight of Water, γ_w (pcf)	62.4
	Unit Weight of Wall, S_g (pcf)	150
	Unit Weight of Soil, γ_{soil} (pcf)	110
Table 4-3	Equivalent Fluid Weight of Submerged Soil and Water, S (pcf)	106

	Height of Wall, H (ft)	10.0
	Height of Soil on Wet Side of Wall, D_h (ft)	0.0
	Height of Soil on Dry Side of Wall, D_t (ft)	7.0
	Thickness of Footing, t_{ftg} (ft)	1.0
	Thickness of Wall, t_{wall} (ft)	1.0
	Width of Footing on Wet Side of Wall, A_h (ft)	2.0
	Width of Footing on Dry Side of Wall, C (ft)	5.0
	Width of Footing Total, B (ft)	8.0

Eqn. 5F-1	Force1 due to Buoyancy, f_{buoy1} (lb/ft)	468.0
Eqn. 5F-1	Force2 due to Buoyancy, f_{buoy2} (lb/ft)	561.6
Eqn. 5F-2	Weight of the Wall, w_{wall} (lb/ft)	1500.0
Eqn. 5F-3	Weight of the Footing, w_{ftg} (lb/ft)	1200.0
Eqn. 5F-4	Weight of Soil over the Dry Side of Wall, w_{st} (lb/ft)	3850.0
Eqn. 5F-5	Weight of Soil over the Wet Side of Wall, w_{sh} (lb/ft)	0.0
Eqn. 5F-6	Weight of Water Above the Wet Side of the Wall, w_{wh} (lb/ft)	0.0
Eqn. 5F-7	Total Gravity Forces Acting Downward, w_g (lb/ft)	6550.0
Eqn. 5F-8	Net Vertical Force, f_v (lb/ft)	6082.0
Eqn. 5F-9	Cumulative Lateral Hydrostatic Force acting at $H/3$, f_{comb} (lb/ft)	3797.0

Check Sliding

Eqn. 5F-10	Friction Force between Footing and Soil, f_{fr} (lb/ft)	3041.0
Eqn. 5F-11	Cohesion Force between Footing and Soil, f_c (lb/ft)	0
Eqn. 5F-12	Passive Saturated Soil Force Over the Toe, f_p (lb/ft)	5804.8
Eqn. 5F-13	Resisting Force to Sliding, f_R (lb/ft)	8845.8
Eqn. 5F-14	Factor of Safety Against Sliding, $FS_{(SL)}$	2.330

Check Overturning

Eqn. 5F-15	Sum of Overturning Moments, M_0 (ft-lbs/ft)	15433.6
Eqn. 4-4	Lateral Hydrostatic Force, F_{sta} (lb/ft)	3120
Eqn. 4-5	Differential Soil/Water Force, F_{dir} (lb/ft)	0
Eqn. 5F-16	Sum of Resisting Moments, M_R (ft-lbs/ft)	38154.5
Eqn. 5F-17	Factor of Safety Against Overturning, $FS_{(OT)}$	2.472

Determine Eccentricity

Eqn. 5F-18	Eccentricity, e (ft)	0.26
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Check Soil Pressure

Eqn. 5F-19	Soil Pressure Created by Forces Acting on the Wall, q_1 (psf)	910.9
Eqn. 5F-19	Soil Pressure Created by Forces Acting on the Wall, q_2 (psf)	609.6

$$f_{buoy} = f_{buoy1} + f_{buoy2} \quad (\text{Eq. 5F-1})$$

with f_{buoy1} and f_{buoy2} computed as follows:

$$f_{buoy1} = \gamma_w \left[(H) \left(\frac{1}{2} t_{wall} \right) + \left(A_h + \frac{1}{2} t_{wall} \right) (t_{fig}) \right] \text{ (based on Equation 4-7)}$$

$$f_{buoy2} = \gamma_w \left[(D_t) \left(\frac{1}{2} t_{wall} \right) + \left(C + \frac{1}{2} t_{wall} \right) (t_{fig}) \right] \text{ (based on Equation 4-7)}$$

$$w_{wall} = (H) t_{wall} S_g \quad (\text{Eq. 5F-2})$$

$$w_{fig} = B t_{fig} S_g \quad (\text{Eq. 5F-3})$$

$$w_{st} = C (D_t) (\gamma_{soil}) \quad (\text{Eq. 5F-4})$$

$$w_{sh} = A_h (D_h) (\gamma_{soil} - \gamma_w) \quad (\text{Eq. 5F-5})$$

$$w_{wh} = A_h (H) (\gamma_w) \quad (\text{Eq. 5F-6})$$

$$w_G = w_{wall} + w_{fig} + w_{st} + w_{sh} + w_{wh} \quad (\text{Eq. 5F-7})$$

$$f_v = w_G - f_{buoy} \geq 0 \quad (\text{Eq. 5F-8})$$

$$f_{comb} = f_{sta} + f_{dif} + (f_{dh} \text{ or } f_d) \quad (\text{Eq. 5F-9})$$

$$f_{sta} = \frac{1}{2} P_h H = \frac{1}{2} \gamma_w H^2 \quad (\text{Eq. 4-4})$$

$$f_{dif} = \frac{1}{2} (S - \gamma_w) D^2 \quad (\text{Eq. 4-5})$$

$$f_f = C_f f_v \quad (\text{Eq. 5F-10})$$

$$f_c = C_c B \quad (\text{Eq. 5F-11})$$

$$f_p = \frac{1}{2} [k_p (\gamma_{soil} - \gamma_w) + \gamma_w] (D_t + t_{fig})^2 \quad (\text{Eq. 5F-12})$$

$$f_R = f_f + f_c + f_p \quad (\text{Eq. 5F-13})$$

$$FS_{(SL)} = \frac{f_R}{(f_{comb} + f_i)} \geq 1.5 \quad (\text{Eq. 5F-14})$$

$$M_O = f_{sta} \left(\frac{(H + t_{fig})}{3} \right) + f_{dif} \left(\frac{(D_h + t_{fig})}{3} \right) + f_{buoy1} \left(\frac{2B}{3} \right) + \left[f_{dh} \left(\frac{(H + t_{fig})}{2} \right) \text{ or } f_d \left((H + t_{fig}) - \frac{(D_h + t_{fig})}{2} + (D_h + t_{fig}) \right) \right] + f_i (H + t_{fig}) + f_{buoy2} \left(\frac{B}{3} \right) \quad (\text{Eq. 5F-15})$$

$$M_R = w_{wall} \left(C + \frac{t_{wall}}{2} \right) + w_{fig} \left(\frac{B}{2} \right) + w_{st} \left(\frac{C}{2} \right) + w_{sh} \left(B - \frac{A_h}{2} \right) + w_{wh} \left(B - \frac{A_h}{2} \right) + f_p \left(\frac{(D_t + t_{fig})}{3} \right) \quad (\text{Eq. 5F-16})$$

$$FS_{(OT)} = \frac{M_R}{M_O} \geq 1.5 \quad (\text{Eq. 5F-17})$$

$$e = \left(\frac{B}{2} \right) - \left(\frac{(M_R - M_O)}{f_v} \right) \quad (\text{Eq. 5F-18})$$

$$q = \left(\frac{f_v}{B} \right) \left(1 \pm \left(\frac{6e}{B} \right) \right) \quad (\text{Eq. 5F-19})$$

- The choice of wall thickness depends on the wall material, the strength of the material, and the height of the wall. Typical wall thicknesses are 8, 12, and 16 inches for masonry, concrete, or masonry/concrete walls.
- The footing width depends on the magnitude of the lateral forces, allowable soil bearing capacity, dead load, and the wall height. The typical footing width is the proposed wall height. Typically, the footing is located under the wall in such a manner that 1/3 of its width forms the toe and 2/3 of the width forms the heel of the wall as shown in Figure 5F-15. Typical footing thicknesses are based upon strength requirements and include 8, 12, and 16 inches.

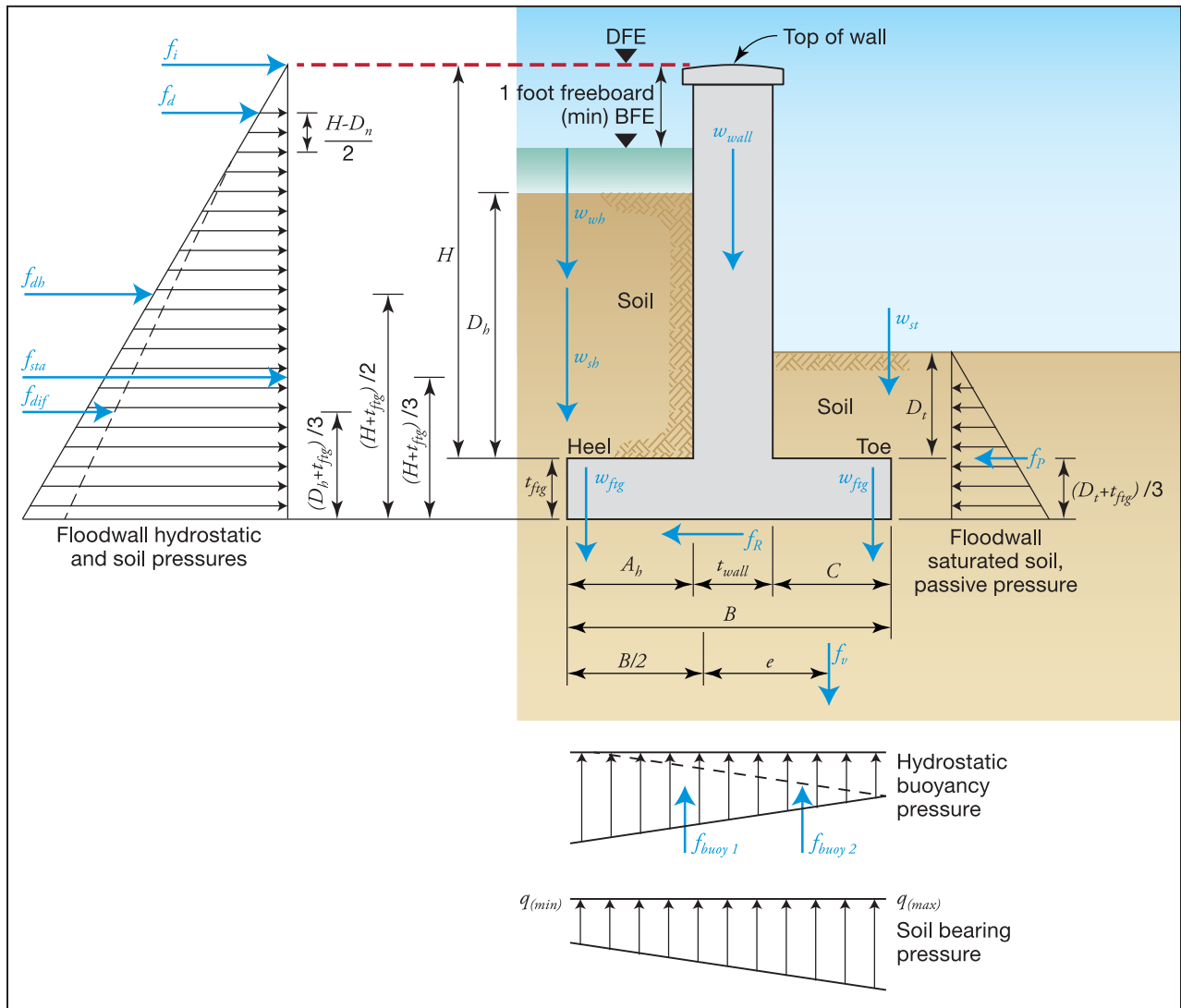


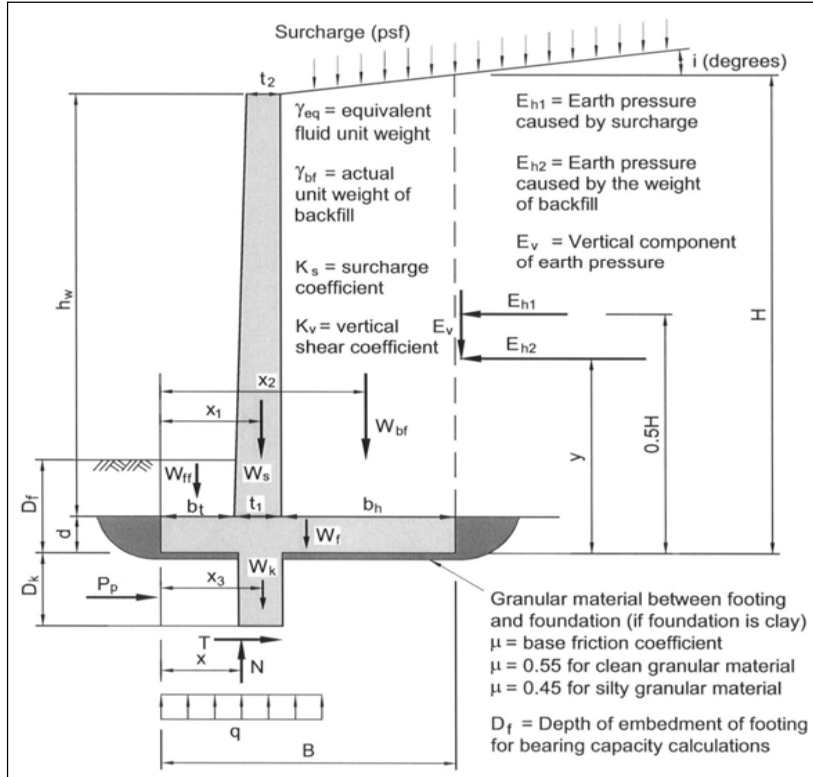
Figure 5F-15. Forces acting on a floodwall

Retaining Wall Stability Computation Sheet 2.05

Developed by J. M. Duncan and R.L. Mokwa, October 1998
 Revised by B. Yang and J. M. Duncan, May, 2002

Change only those values shown in red. Other cells are locked.

Project: 15265 Tuscarora Creek Flood Mitigation
 Calculated by: CL
 Date: 1/9/2016



- Notes:
- P_p = passive pressure resisting force. Passive resistance is only included for the soil in front of a key, that is, only over the depth D_k .
 - f'_c = 28-day compressive strength of concrete (psi).
 - f_y = yield strength of reinforcing steel (psi).
 - ρ = Steel ratio = Area of steel/Area of concrete.
 - ρ_b = Balanced steel ratio - corresponds to equal concrete and steel strength in flexure.
 - The computed stem and footing thicknesses are based on required shear and moment capacity, which depend on f'_c , f_y and ρ . These values are advisory. They are not automatically inserted as wall dimensions.

Flood Wall Section 2

Input

For wall dimensions, loads, and properties

Include surcharge over b_f ? Yes

D_f	= 0.0	ft
h_w	= 10.0	ft
i	= 0	deg.
Backfill γ_{eq}	= 45	pcf
Backfill γ_{bf}	= 120	pcf
Surcharge q_s	= 250	psf
K_s	= 0.35	
μ	= 0.50	
y/H	= 0.35	
K_v	= 0.00	
B	= 8.00	ft
b_t	= 2.00	ft
t_1	= 1.00	ft
t_2	= 1.00	ft
d	= 1.00	ft

Properties of soil in front of key

γ	= 120	pcf
c'	= 200	psf
ϕ'	= 30	deg

Depth of key below footing

D_k = 1.00 ft

For stem and footing thickness

f'_c	= 3,000	psi
f_y	= 60,000	psi
ρ/ρ_b	= 0.45	

Calculated

b_h	= 5.00	ft
H	= 11.00	ft
E_{h1}	= 963	lbs/ft
E_{h2}	= 2,723	lbs/ft
E_h	= 3,685	lbs/ft
E_v	= 0	lbs/ft
W_{bf}	= 6,000	lbs/ft
W_f	= 1,200	lbs/ft
W_s	= 1,500	lbs/ft
W_k	= 150	lbs/ft
W_{ff}	= -240	lbs/ft
y	= 3.85	ft
x_1	= 2.50	ft
x_2	= 5.50	ft
x_3	= 2.50	ft
N	= 9,860	lbs/ft
T	= 3,685	lbs/ft
x	= 3.33	ft
q	= 1,483	psf
P_p	= 873	lb/ft

Calculated

Sliding on granular layer F_s	= 1.57	Should be 1.5 or greater
Position of Resultant x/B	= 0.42	Should be 0.33 or greater
Overtopping F_{om}	= 3.08	Should be 1.5 to 2.0 or greater
Volume of Concrete	= 0.70	Cubic yds per ft of wall
Stem and footing thickness based on shear and moment capacity		
Approximate stem thickness (t_1)	= 0.80 (ft)	Advisory - see note 6 at left
Approximate footing thickness (d)	= 1.00 (ft)	Advisory - see note 6 at left

Retaining Wall Design Calculations - Symbols

a = Depth of equivalent rectangular compressive stress block (in)

A_s = Area of reinforcement (in²)

b = Section width = 12 in/ft

b_h = Width of heel (ft)

B = Width of the footing (ft)

c = cohesion intercept of soil in front of key (psf)

C_{w1} and C_{w2} = water table correction factors (dimensionless)

d = Effective section depth (in)

D_f = depth from ground surface in front of wall to the bottom of the footing (ft)

D_k = depth of key below bottom of footing (ft)

e = eccentricity of normal force from the center of the footing (ft)

E_v = vertical shear load (lb/ft)

E_h = Horizontal earth pressure (lb/ft)

E_{h1} = Horizontal earth pressure caused by surcharge (lb/ft)

E_{h2} = Horizontal earth pressure caused by the weight of backfill (lb/ft)

f'_c = 28-day compressive strength of concrete (lb/in²)

f_y = Yield strength of reinforcing steel (lb/in²)

F_{bc} = bearing capacity factor of safety (dimensionless)

F_{om} = factor of safety against overturning (dimensionless)

F_s = factor of safety against sliding (dimensionless)

h_w = Height of the stem (ft)

H = height of the vertical plane from the heel of the wall to the surface of the backfill (ft)

K_s = surcharge pressure coefficient (dimensionless)

K_v = vertical shear load coefficient (dimensionless)

M_n = Nominal moment capacity (lb·ft/ft)

N = normal load on the footing (lb/ft)

N_{60} = average value of Standard Penetration Test blow count within 2x below the bottom of the footing

N_c = bearing capacity factor (dimensionless)

P_p = passive earth pressure force (lb/ft)

q = bearing pressure (psf)

q_s = surcharge pressure (psf)

q_{ult} = ultimate bearing capacity (psf)

S_u = undrained shear strength of soil (which has $\phi = 0$)

t_1 = thickness of stem at the bottom (ft)

t_2 = thickness of stem at the top (ft)

T = shear load on the footing (lb/ft)

V_n = nominal shear capacity (lb/ft)

W_{bf} = Weight of backfill (lb/ft)

W_f = Weight of footing (lb/ft)

W_{ff} = Weight of soil in front of the stem and above the footing – above b_t (lb/ft)

W_s = Weight of stem (lb/ft)

x = distance from edge of the footing to the point of application of the normal load (ft)

$2x$ = effective footing width (ft)

x_1 = horizontal distance from the weight center of the stem to the toe (ft)

x_2 = horizontal distance from the weight center of backfill to the toe (ft)

y = height of E_{h2} above the base of the footing (ft)

z = depth below the surface of the backfill (ft)

Z_p = depth from the ground surface in front of the wall to mid-height of the key (ft),

ϕ = friction angle of soil in front of key (degrees)

γ = unit weight of soil (pcf)

γ_{bf} = unit weight of backfill (pcf)

γ_{eq} = unit weight of the “equivalent fluid,” which would exert the same lateral pressure as the backfill (pcf)

μ = coefficient of friction between the wall footing and the granular material beneath the footing (dimensionless)

ρ = Reinforcement ratio (dimensionless)

ρ_b = Reinforcement ratio corresponding to balanced failure (dimensionless)

ρ_{max} = Specified maximum reinforcement ratio (dimensionless)

σ_{hb} = horizontal earth pressure due to weight of backfill (psf)

σ_{hs} = horizontal earth pressure due to surcharge pressure (psf)

Forces and dimensions:

$$b_h = B - b_t - t_1$$

$$E_h = 0.5\gamma_{eq}H^2 + Hq_sK_s$$

$$E_{h1} = Hq_sK_s$$

$$E_{h2} = 0.5\gamma_{eq}H^2$$

$$E_v = 0.5K_v\gamma_{bf}H^2$$

$$W_{bf} = 0.5(h_w + H - d)b_h\gamma_{bf}$$

$$W_f = Bd \cdot 150 \quad (150\text{pcf})$$

$$W_s = 0.5(t_1 + t_2)h_w \cdot 150 \quad (150\text{pcf})$$

$$W_k = t_1 \cdot D_k \cdot 150$$

$$W_{ff} = \gamma \cdot b_t(D_f - d)$$

$$x_1 = B_t + \frac{2t_1^2 + 2t_1t_2 - t_2^2}{3(t_1 + t_2)}$$

$$x_2 = B - b_h \frac{(2h_w + H - d)}{3(h_w + H - d)}$$

$$N = E_v + W_{bf} + W_f + W_s + W_k + W_{ff} + b_hq_s \quad \text{with surcharge over footing}$$

$$N = E_v + W_{bf} + W_f + W_s + W_k + W_{ff} \quad \text{without surcharge over footing}$$

$$T = E_h$$

$$x = \frac{BE_v + x_2W_{bf} + x_1W_s + x_3W_k + BW_f/2 + b_tW_{ff}/2 - (0.5K_sq_sH^2 + 0.5\gamma_{eq}H^2y)}{N}$$

without surcharge over the footing

$$x = \frac{BE_v + x_2W_{bf} + x_1W_s + x_3W_k + BW_f/2 + b_tW_{ff}/2 - (0.5K_sq_sH^2 + 0.5\gamma_{eq}H^2y) + q_sb_h(B - b_h/2)}{N}$$

with surcharge over the footing

$$M = K_sq_s(H - d)^2/2 + \gamma_{eq}(H - d)^3/6 \quad (\text{Moment at the bottom of the stem})$$

$$V = 0.5\gamma_{eq}(H - d)^2 + (H - d)q_sK_s \quad (\text{Shear force at the bottom of the stem})$$

$$e = \frac{B}{2} - x$$

$$q_{\max} = \frac{N}{B} \left(1 + \frac{6e}{B}\right) \quad \text{if } e \leq \frac{B}{6}$$

$$q_{\max} = \frac{2N}{3x} \quad \text{if } e > \frac{B}{6}$$

$$q_{\min} = \frac{N}{B} \left(1 - \frac{6e}{B}\right) \quad \text{if } e \leq \frac{B}{6}$$

$$q = \frac{N}{2x}$$

Passive pressure on the key:

$$P_p = D_k \left\{ 2c \tan(45^\circ + \phi/2) + \gamma Z_p \tan^2(45^\circ + \phi/2) \right\}$$

$$Z_p = D_f + D_k / 2$$

Sliding through granular soil:

$$F_s = \frac{\mu N + P_p}{T}$$

Overturning:

$$F_{om} = \frac{W_f B / 2 + W_s x_1 + W_{bf} x_2 + W_k x_3 + W_{ff} b_t / 2 + E_v B}{0.5 K_s q_s H^2 + 0.5 \gamma_{eq} H^2 y} \text{ without surcharge over footing}$$

$$F_{om} = \frac{W_f B / 2 + W_s x_1 + W_{bf} x_2 + W_k x_3 + W_{ff} b_t / 2 + E_v B + q_s b_h (B - b_h / 2)}{0.5 K_s q_s H^2 + 0.5 \gamma_{eq} H^2 y} \text{ with surcharge over}$$

footing

▪ **Bearing capacity for cohesive soil foundations**

$q_{ult} = N_c S_u + \gamma D_f$, γ is the smaller of the unit weights of the backfill and foundation

$$N_c = 5 \left(1 + 0.2 \frac{D_f}{2x} \right) \left(1 - 1.3 \frac{T}{N} \right)$$

$$F_{bc} = q_{ult} / q$$

▪ **Bearing capacity for granular soil foundations**

$$q_{ult} = 2000 \frac{N_{SPT}(2x)}{10} \left(C_{w1} + C_{w2} \frac{D_f}{2x} \right) \left(1 - 2 \frac{T}{N} \right)$$

$$F_{bc} = q_{ult} / q$$

Water Table	C_{w1}	C_{w2}
At the ground surface	0.5	0.5
At Base of the Footing	0.5	1.0
2x below footing	1.0	1.0

For intermediate water table depths, interpolate linearly between these values.

▪ **Shear capacity and moment capacity**

$$V_n = 2bd \sqrt{f_c'}$$

$$M_n = A_s f_y \left(d - \frac{a}{2} \right)$$

$$0.85 f_c' ab = A_s f_y$$

$$\rho = \frac{A_s}{bd} \leq \rho_{\max}$$

$$\rho_b = \frac{0.85\beta_1 f_c'}{f_y} \left(\frac{87,000}{87,000 + f_y} \right)$$

$$\beta_1 = 0.85 \quad \text{when } f_c' \leq 4000 \text{ psi}$$

$$= 1.05 - 0.05 \frac{f_c'}{1000} \quad \text{when } 4000 < f_c' \leq 8000 \text{ psi}$$

$$= 0.65 \quad \text{when } f_c' > 8000 \text{ psi}$$