CITY OF HARRISONBURG
DEPARTMENT OF FINANCE
AND PURCHASING
409 SOUTH MAIN STREET,
THIRD FLOOR
HARRISONBURG, VA 22801

INVITATION TO BID (ITB) COVER PAGE

ISSUE DATE: October 11, 2016	**INVITATION TO BID NUMBER:** 2017013-PW-B	**FOR:** Bluestone Trail Extension, RS16-115-251
DEPARTMENT: Public Works	**DATE/TIME OF CLOSING:** November 9, 2016 at 3:00pm local time	**CONTRACT ADMINISTRATOR:** Kim Cameron, PE
DATE/TIME LAST DAY FOR QUESTIONS: November 2, 2016 at 12:00pm (noon) local time	**DATE/TIME PRE-BID MEETING:** October 25, 2016 at 1:00pm local time	**PRE-BID MEETING MANDATORY:** **X** Yes __No __ N/A

Bids - In accordance with the following and in compliance with all terms and conditions, unless otherwise noted, the undersigned offers and agrees, if the bid is accepted, to furnish items or services for which prices are quoted, delivered or furnished to designated points within the time specified. It is understood and agreed that this entire ITB and any addenda shall constitute a contract.

Sealed bids, subject to terms and conditions of this Invitation to Bid will be received by the City of Harrisonburg Purchasing Office, 409 South Main Street, Third Floor, Harrisonburg, Virginia 22801 until the date/ time specified above for furnishing items or services delivered or furnished to specified destinations within the time specified or stipulated by the vendor(s).

The City does not discriminate against small and minority businesses or faith-based organizations.

VENDOR INFORMATION

Name of Vendor:_____ Telephone #:_____

Address: _____ Federal Employer Identification #:_____

_____ State Corporation Commission #:_____

Contact Name: _____ Contact Email Address:_____

By signing this bid, Vendor(s) certifies, acknowledges, understands and agrees to be bound by the conditions set forth in this ITB.

_____ _____
VENDOR'S LEGALLY AUTHORIZED SIGNATURE **DATE**

_____ _____
PRINT NAME **TITLE**

Please take a moment to let us know how you found out about this Invitation to Bid (ITB) – Check one:

☐ City of Harrisonburg Website ☐ eVA Website ☐ Bid Room (Please List) _____

☐ The Daily News Record Newspaper ☐ Notified by City Directly

☐ Other (Please List) _____

This document must be completed & returned with bid submission.

PROJECT MANUAL

FOR

CITY OF HARRISONBURG, VIRGINIA

BLUESTONE TRAIL EXTENSION

PROJECT:

RS16-115-251

UPC:

107147

CITY OF HARRISONBURG, VIRGINIA

DEPARTMENT OF PUBLIC WORKS

October 11, 2016

Prepared by

Department of Public Works
City of Harrisonburg
320 East Mosby Road
Harrisonburg, Virginia 22801

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SECTION 0001
INVITATION TO BIDDERS

1. PROJECT

Bluestone Trail Extension for the City of Harrisonburg, VA

2. DESCRIPTION OF WORK

Construction of multi-use trail, curb & gutter, CG-12 detectible warning surface, concrete entrances, and utility relocations and incidental items required to complete the work. Start work by May 8, 2017. Entire project must be completed by August 11, 2017.

3. DOCUMENTS

Bid documents are available for viewing on the internet at www.harrisonburgva.gov/bids-proposals and also on the eVA website at www.eva.virginia.gov. Bid documents are available for purchase at DTS Reprographics 4803 South Valley Pike, Harrisonburg VA, 22801, (540) 433-8373.

4. MANDATORY PRE-BID CONFERENCE

October 25, 2016 at 1:00 PM EST at the City of Harrisonburg City Hall, 409 South Main Street, Room 11 and 12, lower level. Attendance is mandatory. After the pre-bid meeting there will be an optional Project Showing on site. Transportation to the site will be provided by James Madison University. Questions will be received up until November 2, 2016 at 12:00 PM noon EST and posted as addenda on the City's website at www.harrisonburgva.gov/bids-proposals as well as on the eVA website at www.eva.virginia,gov.

5. BID BOND

Bids shall be accompanied by a 5% bid security. Bid bond must be in the form of a cashier's check, certified check or a bid bond issued by a surety.

6. BIDS DUE

November 9, 2016 at 3:00 PM EST at the City of Harrisonburg, Purchasing Office, 409 South Main Street, Third Floor, Harrisonburg, VA, 22801.

7. BID OPENING

Bids will be opened and read publicly at City Hall, 409 South Main Street, in Room 11 and 12, lower level.

8. OWNER

City of Harrisonburg, 409 South Main Street, Harrisonburg, VA, 22801

9. CONTRACT ADMINISTRATOR

Kim Cameron, PE, 320 East Mosby Road, Harrisonburg, VA 22801.

SECTION 0100
INSTRUCTIONS TO BIDDERS

1. SECURING DOCUMENTS

Bid documents are available for viewing at the following Harrisonburg locations: Department of Public Works, 320 East Mosby Road, Harrisonburg VA, 22801, (540) 434-5928.

Bid documents are available for viewing on the internet at www.harrisonburgva.gov/bids-proposals and also on the eVA website at www.eva.virginia.gov.

Bid documents are available for purchase at DTS Reprographics 4803 South Valley Pike, Harrisonburg VA, 22801, (540) 433-8373.

2. BIDDER ELIGIBILITY

A. Bids

Bids will only be accepted from Contractors who are experienced in and actively engaged in the type of construction of the item(s) called for in the bid. No bid will be accepted from or contract awarded to any person, firm, or corporation that is in arrears or is in default to the City upon any debt or contract, or that is a defaulter, as surety or otherwise, upon any obligation to said City or had failed to perform faithfully any previous contract with the City. Where an installation or assembly is to be performed by a subcontractor, the bidder must name the subcontractor, and the City reserves the right to determine whether the named subcontractor is fit and capable to perform the required work. Bidders must be prequalified with VDOT to be considered responsive bidders on this project. A copy of the bidder's VDOT Certificate of Qualifications must be submitted with the bid documents. All subcontractors shall be prequalified with VDOT for all prequalifiable trades.

B. Bidders are required under Chapter 11, Title 54, Code of Virginia, to show evidence of certificate of registration before bid may be received and considered.

C. Bidders must certify in the bid form that they are not currently barred from bidding on contracts by any agency of the Commonwealth of Virginia or any federal agency.

3. BID FORM AND SUBMISSION

In order to receive consideration, submit bids in accordance with the following:

A. Make bids upon the forms provided herewith, properly signed and with all items filled out. Do not change the wording of the bid form, and do not add words to the bid form. Unauthorized conditions, limitations, or provisions attached to the bid may be cause for rejection of the bid.

B. Address bids to the Owner, and deliver to the address specified in the invitation to bid on or before the day and hour set for opening the bids. Enclose each bid in an

opaque, sealed envelope or box bearing the title of the Work, the project number(s), the ITB number, the name of the bidder, Virginia contractor registration number and the date and hour of the bid opening, Submit only the original signed copy of the bid. The City of Harrisonburg is not responsible for delays in the delivery of the mail by the U.S. Postal Service, private couriers, or the inter-office mail system. It is the sole responsibility of the bidder to see that his bid is received on time. No faxed or emailed bid will be considered. No bids received after the time fixed for receiving them will be considered. Late or incomplete bids may be returned to the bidder. All expenses for making bids to the City shall be borne by the bidder.

C. Indicate receipt of issued addenda. All Bidders are cautioned to check at www.harrisonburgva.gov/bids-proposals or at www.eva.virginia.gov to assure that all addenda have been received and that the cost consequences thereof have been included in the bid.

D. Although the bid is based upon unit prices, many items are to be priced under lump sum designations. It is the bidder's responsibility to verify the exact scope of work for all items in order to establish a bid price.

E. The following documents fully completed and signed where appropriate are required for a responsive bid:

i) Signed Cover Sheet
ii) Bid Form
iii) Bid Security
iv) Contractor Eligibility and Registration
v) State Corporation Commission Registration
vi) VDOT Form C-48 (City Revision)
vii) Copy of VDOT Certification of Qualifications
viii) Insurance Requirements for the City of Harrisonburg
ix) Signed Addenda, if applicable
x) Reference Sheet Attachment A

4. BONDS

A. Bid security in the amount stated in the Invitation to Bid must accompany each bid. The successful bidder's security will not be returned until he has signed the Contract and has furnished the required Certificates of Insurance.

B. The Owner reserves the right to retain the security of all bidders until the successful bidder enters into the Contract or until 90 days after bid opening, whichever is sooner. Other bid security will be returned as soon as practicable. If any bidder refuses to enter into a Contract, their bid security may be forfeited.

C. Prior to signing the Contract, the Owner will require the successful bidder to secure and post a Labor and Materials Payment Bond and a Performance Bond, each in the amount of 100% of the Contract Sum. Such Bonds shall be issued by a Surety acceptable to the Owner.

5. EXAMINATION OF DOCUMENTS AND SITE OF WORK

Before submitting a bid, each bidder shall examine the Drawings carefully, shall read the Project Manual and all other proposed Contract Documents, and shall visit the site of the Work. Each bidder shall fully inform himself prior to bidding as to existing conditions and limitations under which the Work is to be performed, and shall include in his bid a sum to cover the cost of items necessary to perform the Work as set forth in the proposed Contract Documents. No allowance will be made to a bidder because of lack of such examination and knowledge. The submission of a bid will be considered as conclusive evidence that the bidder has made such examination.

6. COMPLIANCE WITH STATE REQUIREMENTS

Contactor shall comply with Section 0900, State Requirements.

7. INTERPRETATION OF CONTRACT DOCUMENTS PRIOR TO BIDDING

If any person contemplating submitting a bid for construction of the Work is in doubt as to the true meaning of any part of the proposed Contract Documents, or finds discrepancies on or omissions from any part of the proposed Contract Documents, he shall submit a written request to Ms. Pat Hilliard, Procurement Manager, by email to Purchasing@harrisonburgva.gov or by fax to 540-432-7779. Oral questions will not be permitted. All questions must be received no later than November 2, 2016 at 12:00 PM noon EST. The person submitting the request shall be responsible for any other interpretations of the proposed Contract Documents. Questions will be answered in Addendum format and posted as outlined in the invitation to bid, at www.harrisonburgva.gov/bids-proposals and at www.eva.virginia.gov. It is the responsibility of all bidders to ensure that they have received all addenda and to include signed copies of any and all addenda with their bid submission.

8. AWARD OF CONTRACT

The Contract, if awarded, will be awarded to the lowest responsive and responsible bidder, meeting all specifications, subject to the Owner's right to reject any or all bids and to waive informality and irregularity in the bids and in the bidding. If the bid from the lowest responsible bidder exceeds available funds, the Procurement Manager, or designee, may negotiate with the apparent low bidder to obtain a contract price within available funds.

9. EXECUTION OF AGREEMENT

A. The form of the Agreement which the successful bidder will be required to execute is included in the Project Manual.

B. The bidder to whom the Contract is awarded shall, within ten (10) calendar days after notice of award and receipt of Agreement forms from the Owner, sign and deliver required copies to the Owner.

C. At or prior to delivery of the signed Agreement, the bidder to whom the Contract is awarded shall deliver to the Owner those Certificates of Insurance and Endorsement required by the Contract Documents and such Labor and Materials Payment Bonds and Performance Bond and City Business License, as are required by the Owner.

D. Bonds and Certificates of Insurance shall be approved by the Owner before the successful bidder may proceed with the Work. Failure or refusal to provide Bonds or Certificates of Insurance and Endorsement in a form satisfactory to the Owner shall subject the successful bidder to loss of time from the allowable construction period equal to the time of delay in furnishing the required material.

10. CONSTRUCTION TIME AND LIQUIDATED DAMAGES

A. The Agreement includes a stipulation that all Work be completed by a specified date (see section 0501). Any work not completed by the specified date will be accessed Liquidated Damages at the rate of $1,500.00 per each consecutive calendar day until the work is substantially completed. The contractor is not to begin work until the receipt of the Owner's Notice to Proceed which will be effective upon receipt. This is a Fixed Completion Date project.

11. INSURANCE REQUIREMENTS

This form must be signed and returned with your bid submission.

By signing and submitting a bid or proposal the contractor certifies that if awarded the contract, they will have the following insurance coverages at the time the contract is awarded. If any subcontractors are involved, the subcontractor will have the same insurance. The contractor further certifies that they or any subcontractor will maintain these coverages during the entire term of the contract.

1.) The contractor will maintain a general liability policy with $1,000,000 combined single limits. Coverage is to be on an occurrence basis with an insurer licensed to conduct business in the Commonwealth of Virginia. The insurer must have an A. M. Best rating of A- or better. **The insurer must list the City of Harrisonburg and James Madison University as an additional insured. The endorsement must be issued by the insurance company. A notation on the certificate of insurance is not sufficient.**

2.) The contractor will maintain workers' compensation coverage in compliance with the laws of the Commonwealth of Virginia. The coverage must have statutory limits and be with an insurer licensed to conduct business in the Commonwealth of Virginia. The insurer must have an A. M. Best rating of A- or better. As an alternative, it is acceptable for the contractor to be insured by a group self insurance association that is licensed by the Virginia Bureau of Insurance. The contractor will also carry employers liability insurance with a limit of at least $100,000 bodily injury by accident/$500,000 bodily injury by disease policy limit/$100,000 bodily injury by disease each employee.

3.) The contractor will maintain automobile liability insurance with limits of at least $1,000,000. The coverage is to be written with a symbol "1". The insurer must be licensed to conduct business in the Commonwealth of Virginia. The insurer must have an A. M. Best rating of A- or better.

With all policies listed above, the insurer or agent of the insurer must issue a certificate of insurance to show evidence of coverage.

BIDDER/OFFEROR STATEMENT

We understand the Insurance Requirements of these specifications and will comply in full if awarded this contract.

Signature:_____Date:_____

Name:_____Title_____
(Print)

Name of Firm: _____

0100-5

12. CITY BUSINESS LICENSE

A. City of Harrisonburg Business License is required for successful award of this project. At or prior to delivery of the signed Agreement/Contract, the bidder to whom the Contract is awarded shall deliver to the Owner a copy of their City Business License. The bidder shall ensure that the Business License indicates a basis amount equal to or greater than the awarded Contract value. For information on City Business Licenses contact the Harrisonburg Commissioner of Revenue office at 540-432-7704.

13. STANDARD SPECIFICATIONS AND STANDARDS

Work in this project shall conform to the latest edition of the Virginia Department of Transportation (VDOT) Road and Bridge Specifications, the VDOT Road and Bridge Standards, the Virginia Erosion and Sediment Control handbook, and the Virginia Erosion and Sediment Control regulations. In the event of conflict between any of these standards, specifications or plans, the VDOT specification 105.12 will apply, and shows the hierarchy of documents and which shall govern.

14. CONSIDERATION OF PROJECT COMPLEXITIES

A. In preparing this bid, Contractor shall understand and account in his costs for the complexities involved in administrating the construction required by this Contract. Contractor shall be aware that the project area receives heavy vehicular and pedestrian traffic. Contractor shall accommodate such traffic through and around the work area in a safe and well-marked manner.

B. Submission of a bid shall be an affirmation that the Contractor understands these complexities and difficulties associated with this project, that he has included in his bid a sufficient dollar amount to compensate for the additional time and effort these complexities and difficulties will require on his part, and that he understands that the Owner will not accept any claim for time extension or additional costs associated with them.

END INSTRUCTIONS TO BIDDERS

0300 BID FORM

Mr. James Baker
Director
Department of Public Works
320 East Mosby Road
Harrisonburg, Virginia 22801

Dear Sir:

The undersigned, having visited and examined the site and having carefully studied the drawings and project manual for the City of Harrisonburg, Bluestone Trail Extension, hereby proposes to furnish all plant, labor, equipment, materials, and services and to perform all operations necessary to execute and complete the work required for the project in strict accordance with the drawings dated February 5, 2016 and the project manual dated October 11, 2016, together with addenda numbered _____, issued during bidding period and hereby acknowledged subject to the terms and conditions of the Agreement for the following sums of money:

BASE BID PROPOSAL

All labor, material, services and equipment necessary for the completion of the work shown on the Drawings and in the Project Manual and in the Addenda (if issued).

_____($_____)

This bid submitted by (name of firm): _____

ADD ALTERNATE BID PROPOSAL

All labor, material, services and equipment necessary for the completion of the work shown on the Drawings and in the Project Manual and in the Addenda (if issued).

_____($_____)

This bid submitted by (name of firm): _____

<u>This project will be awarded based on the BASE BID PROPOSAL.</u>

It is understood and agreed that the Owner, in protecting his best interests, reserves the right to:

Reject any and all bids, or waive any defects in favor of the City, OR

Accept any bid at the bid price, whereupon the contractor shall furnish equipment and materials as specified.

Contractors shall indicate a unit price for each item listed in the Pay Items Summary which follows. The listed pay items are to contain all necessary costs required for completion of the work. It is understood that all quantities listed below are estimated quantities and the Owner reserves the right to raise, lower or eliminate any quantity or item. Unit prices shall be used in determining partial and full payment.

Bluestone Trail Extension RS16-115-251						
LINE #	**ITEM #**	**DESCRIPTION**	**UNIT**	**EST. QUANTITY**	**UNIT PRICE ($)**	**AMOUNT ($)**
1	00100	MOBILIZATION	LS	1		
2	00101	CONSTRUCTION SURVEYING	LS	1		
3	27000	SELECT TREE REMOVAL, TRIM, AND CLEAR	AC	0.25		
4	14120	REMOVAL OF COMBINATION CURB AND GUTTER	LF	1065		
5	51910	SAW CUT	LF	1414		
6	24410	DEMOLITION OF PAVEMENT	SY	265		
7	14100	REMOVAL OF SIDEWALK AND ENTRANCE	SY	321		
8	54106	ERADICATION OF EXISTING PAVEMENT MARKINGS	LF	2500		
9	24502	NS REMOVAL OF SIGN	EA	2		
10	24702	NS REMOVAL OF WHEEL STOP	EA	6		
11	24505	NS REMOVAL OF PARKING METERS	EA	17		
12	01150	15" CONCRETE PIPE (Installed)	LF	90		
13	01600	STORM SEWER PIPE 5' x 5' DOUBLE BOX CULVERT	LF	12		
14	14506	DI-1 PRECAST TOP	EA	1		
15	06745	DROP INLET DI-2A	EA	1		
16	06815	DROP INLET DI-3A	EA	1		
17	85012	JB-1 JUNCTION BOX	EA	1		
18	60120	STRUCTURE EXCAVATION (8'X11.5' STORM STRUCTURE)	CY	500		
19	26119	DRY RIPRAP CLASS I (TRENCH STABLIZATION)	TON	50		
20	85011	PRECAST 8'X11.5' STORM STRUCTURE	LS	1		
21	85011	ALUM. GRATE WITH BEARING BARS (8'X11.5' STORM STRUCTURE)	LS	1		
22	85011	ELECTRICAL LINE RELOCATION (8'X11.5' STORM STRUCTURE)	LS	1		
23	24505	STEAM VENT RELOCATION (8'X11.5' STORM STRUCTURE)	EA	1		
24	85011	TEMPORARY BYPASS PUMPING SERVICE (3,500 GPM)	LS	1		

25	02112	PRECAST ANGLE STORM STRUCTURE	EA	1		
26	42765	ADJUST EXISTING SANITARY MANHOLE RIM	EA	1		
27	41825	RELOCATE EXISTING FIRE HYDRANT	EA	1		
29	24535	ADJUST EXISTING TELECOM MANHOLE RIM	EA	1		
30	50707	DEMO OF EXISTING POLE FOUNDATION	EA	17		
31	50707	DEMOLITION OF EXISTING BRANCH CIRCUIT #10awg	LF	1275		
32	50707	DEMOLITION OF EXISTING POLE AND LIGHT FIXTURES	EA	17		
33	50707	DEMOLITION OF EXSTING FEEDER (CONDUIT & WIRE)	LF	1500		
34	51942	DEMOLITION OF EXISTING PEDEST. PUSH-BUTTON	EA	1		
35	41980	DEMOLITION OF EXISTING POWER PEDESTAL	EA	1		
36	55165	MOUNT NEW LIGHT FIXTURES ON EXISTING POLES	EA	36		
37	50575	NEW POLE FOUNDATIONS	EA	17		
38	55165	ERECT POLES	EA	17		
39	56021	NEW BRANCH CIRCUITS	LF	1500		
40	56028	NEW FEEDERS	LF	6608		
41	51942	PEDESTRIAN PUSHBUTTON	EA	1		
42	55168	NEW FIXTURES	EA	36		
43	55168	NEW POLES	EA	2		
44	10121	POWER PEDESTAL	EA	1		
45	51942	FEEDER TO POWER PEDESTAL (#6AWG & CONDUIT)	LF	2200		
46	10123	AGGR. BASE MAT'L TY. I NO. 21A	TON	865		
47	10250	AGGR. BASE MAT'L NO. 57	TON	200		
48	10635	ASPHALT CONCRETE TY SM-9.5A	TON	165		
49	13220	HYDR. CEMENT CONC. SIDEWALK (6 IN.)	SY	287		
50	12600	ST'D COMB. CURB & GUTTER CG-6	LF	820		
51	14414	ST'D CURB & GUTTER CG-2	LF	1200		
52	13108	CG-12 DETECTABLE WARNING SURFACE	SY	30		
53	51962	RELOCATE EXSINTG WHEEL STOP	EA	11		

54	51951	SIGN (INSTALLED)	EA	12		
55	54022	PAVEMENT MARKING	LF	1570		
56	54022	CROSSWALK STRIPING	LF	1412		
57	00120	REGULAR EXCAVATION (MULTI-USE PATH)	CY	632		
58	64005	FILL MATERIAL	TON	450		
59	27221	FERTILIZER (10-10-10)	TON	0.1		
60	27102	SEED	LBS	40		
61	27250	LIME	TON	0.74		
62	24282	FLAGGER SERVICE	HR	500		
63	85011	CONSTRUCTION ENTRANCE	EA	1		
64	50001	CONSTRUCTION SIGNS	LS	1		
65	23560	TEMP. SAFETY FENCE	LF	4362		
66	27451	INLET PROTECTION	EA	10		
67	85004	TREE PROTECTION	LF	740		
68	27505	SILT FENCE	LF	1131		
69	85011	EROSION LOG WITH FLOCMAT (10' LENGTHS)	EA	50		

Total Base Bid $_____

Bluestone Trail Extension

RS16-115-251

ADD ALTERNATE BID

LINE #	ITEM #	DESCRIPTION	UNIT	EST. QUANTITY	UNIT PRICE ($)	AMOUNT ($)
1	39001	LANDSCAPING TREES - 3.5" CAL./16' HT. OCTOBER GLORY MAPLE	EA	13		
2	38950	LANDSCAPING TREES - 8' HT. AUTUMN BRILLIANCE SERVICEBERRY	EA	2		
3	39001	LANDSCAPING TREES - 2.5" CAL. FOREST PANSY REDBUD	EA	5		
4	29193	LANDSCAPING TREES - 2.5" CAL. KOUSA DOGWOOD	EA	2		
5	38950	LANDSCAPING SHRUBS - 2' HT. BLUE MUFFIN VIBURNUM	EA	39		
6	38950	LANDSCAPING SHRUBS -2' HT. DWARF WITCHALDER	EA	7		
7	38950	LANDSCAPING SHRUBS - 2' HT. NORDIC HOLLY	EA	72		
8	38950	LANDSCAPING SHRUBS - 2' HT. VIRGINIA SWEETSPIRE	EA	63		
9	38950	LANDSCAPE GRASSES - 3 GAL. BURGUNDY SWITCH GRASS	EA	35		
10	38950	LANDSCAPE GRASSES - 1 GAL. HAMELN DWARF FOUNTAIN GRASS	EA	592		
11	38950	LANDSCAPE GROUND COVERS - 1 QT. SEASONAL ANNUALS	EA	433		
12	38950	LANDSCAPE GROUND COVERS - 3 GAL. GRO-LOW FRAGRANT SUMAC	EA	17		
13	38950	LANDSCAPE GROUND COVERS -1 GAL. PURPLE CONEFLOWER	EA	99		
14	38950	LANDSCAPE GROUND COVERS - 1 GAL.HAPPY RETURN DAYLILY	EA	410		
15	38950	LANDSCAPE GROUND COVERS - 1 GAL. VARIEGATED LILY TURF	EA	178		

Total Add Alternate Bid $_____

0301 BID SECURITY

We are properly equipped to execute work of the character and extent indicated by the bidding documents and so covered by this bid and will enter into agreement for the execution and completion of the work in accordance with the drawings and project manual and this bid; and we further agree that if awarded the contract, we will commence the work on the date stated in the "Notice to Proceed" document and prosecute the work and all obligations by the specified completion dates.

Enclosed herewith is the following security, offered as evidence that the undersigned will enter into agreement for the execution and completion of the work in accordance with the drawings and project manual.

Certified check or Cashier's check for the sum of

$_____

_____
Name of Bank

Bidder's Bond in the amount of

$_____

_____
Bond issued by

The undersigned further agrees that in case of failure on his part to execute the said agreement within the ten consecutive calendar days after written notice being given on the award of the contract, the monies payable by the security accompanying this bid shall be paid to the City of Harrisonburg, Virginia as bid bond shall be forfeited for such failure, otherwise, the security accompanying this bid shall be returned to the undersigned.

This bid is subject to acceptance within a period of 30 days from this date.

Respectfully submitted,

_____
Company Name

By_____
Signature of Authorized

Printed Name _____

Date _____

0302 CONTRACTOR ELIGIBILITY AND REGISTRATION

This is to certify that I (we) are not currently barred from bidding on contracts by any agency of The Commonwealth of Virginia, nor am I (we) a part of any firm/corporation that is currently barred from bidding on contracts by any agency of The Commonwealth of Virginia.

Check one:

_____I am currently registered as a contractor in the Commonwealth of Virginia.

_____My registration number is _____

_____I am currently not required to register as a contractor in the Commonwealth of Virginia per Chapter 11, Title 54 of the Code of Virginia.

_____
Contractor

[SEAL]

_____
Address

_____

_____

_____
Attest

By:_____
Signature

_____
Title

_____
Date

0303 State Corporation Commission Form

<u>Virginia State Corporation Commission ("SCC") registration information</u>:

The undersigned Offeror:

☐ is a corporation or other business entity with the following SCC identification number: _____ **-OR-**

☐ is not a corporation, limited liability company, limited partnership, registered limited liability partnership, or business trust **-OR-**

☐ is an out-of-state business entity that does not regularly and continuously maintain as part of its ordinary and customary business any employees, agents, offices, facilities, or inventories in Virginia (not counting any employees or agents in Virginia who merely solicit orders that require acceptance outside Virginia before they become contracts, and not counting any incidental presence of the Offeror in Virginia that is needed in order to assemble, maintain, and repair goods in accordance with the contracts by which such goods were sold and shipped into Virginia from bidder's out-of-state location) **-OR-**

☐ is an out-of-state business entity that is including with this bid an opinion of legal counsel which accurately and completely discloses the undersigned Offeror's current contacts with Virginia and describes why those contacts do not constitute the transaction of business in Virginia within the meaning of § 13.1-757 or other similar provisions in Titles 13.1 or 50 of the Code of Virginia. **Attach opinion of legal counsel to this form.**

****NOTE**** >> Check the following box if you have not completed any of the foregoing options but currently have pending before the SCC an application for authority to transact business in the Commonwealth of Virginia and wish to be considered for a waiver to allow you to submit the SCC identification number after the due date for proposals (the Commonwealth reserves the right to determine in its sole discretion whether to allow such waiver): ☐

Signature: _____ **Date:** _____

Name: _____
Print

Title: _____

Name of Firm: _____

0304 NON-COLLUSION AFFIDAVIT

Under oath, I hereby affirm under penalty of perjury:

(1) That I am the bidder or a partner of the bidder, or an officer or employee of the bidding corporation with authority to sign on its behalf;

(2) That the attached bid or bids have been arrived at by the bidder and have been arrived at and submitted without collusion or any design to limit bidding or competition;

(3) That the contents of the bid or bids have not been communicated to any person not an employee or agent of the bidder on any bid furnished with the bid or bids, and will not be communicated to any such person prior to the official opening of the bid or bids; and

(4) That I have fully informed myself regarding the accuracy of the statements made in this affidavit.

Signed_____

Title_____

Firm Name _____

CITY / COUNTY OF _____
STATE OF _____, to wit:

I, _____, a Notary Public, do certify that

_____whose name is signed to the foregoing has

this date acknowledged the same before me in my City foresaid.

Given under my hand this_____day of_____, 20___.

My Commission expires_____.

_____
Notary Public

Form C-48
Rev. 2-23-11
City Rev. 10-29-15

0305 COMMONWEALTH OF VIRGINIA
DEPARTMENT OF TRANSPORTATION
SUBCONTRACTOR / SUPPLIER SOLICITATION AND UTILIZATION FORM (ALL BIDDERS)

PROJECT NO. _____ **CONTRACT I.D. NO.** _____

FHWA NO. _____ **DATE SUBMITTED** _____

All bidders, including DBEs bidding as Prime Contractors, shall complete and submit the following information as requested as part of the bid submittal.

The bidder certifies this form accurately represents its solicitation and utilization or non-utilization, as indicated, of the firms listed below for performance of work on this contract and/or supply of materials for this contract. The bidder also certifies he/she has had direct contact with the named firms regarding participation on this project.

BIDDER _____ **SIGNATURE** _____

TITLE _____

SUBCONTRACTOR / SUPPLIER SOLICITATION AND UTILIZATION (ALL)

VENDOR NUMBER	NAME OF SUBCONTRACTOR/SUPPLIER	TELEPHONE NUMBER	DBE OR NON-DBE	UTILIZED (Y/N)

NOTE: Attach additional pages, if needed. Bidder must sign each sheet to certify content and completion of form.

0400 GENERAL TERMS AND CONDITIONS OF THE CITY OF HARRISONBURG, VA

These General Terms & Conditions shall apply to all purchases and be a part of every contract awarded by the City of Harrisonburg unless otherwise specified in writing. Bidders/Offerors are expected to inform themselves fully as to the conditions, requirements and specifications before submitting bids/proposals. Procurement by the City is subject to the Virginia Public Procurement Act (VPPA) Title 2.2, Chapter 43 of the Code of Virginia and the provisions of The Purchasing and Contracting Policy Manual for the City of Harrisonburg and any revisions thereto. If an inconsistency exists between the VPPA and the Purchasing and Contracting Policy Manual for the City, the VPPA Virginia Code sections take precedence.

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DEFINITIONS

ADDENDUM/ADDENDA: **A**ddition(s) or supplement(s) to a solicitation to clarify, modify or support information which becomes part of the contract.

BID: The offer of a prospective vendor/supplier to an Invitation To Bid to provide specific goods or services at specified prices and/or other conditions specified in the solicitation.

BIDDER/OFFEROR: Any individual, company, firm, corporation, partnership or other organization who submits a response to an Invitation to Bid or a Request for Proposal and offering to enter into a contract with the City.

COLLUSION: A secret agreement or cooperation between two or more parties to accomplish a fraudulent, deceitful, or unlawful purpose.

CONFLICT OF INTEREST: An actual or potential situation in which the personal interests of a vendor, employee or public official are, or appear to be, in conflict with the best interests of the City.

CONTRACTOR: The entity that has a direct contract with the City to furnish goods, services or construction for a certain price.

CITY or OWNER: City of Harrisonburg, Virginia.

DAY(S): Defined as calendar days unless otherwise specified as business days.

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

INVITATION TO BID (ITB): A formal request which is made to prospective suppliers (bidders) for their quotation on goods, services, or construction desired by the City. The issuance of an ITB will contain or incorporate by reference the specifications and contractual terms and conditions applicable to the procurement.

PROFESSIONAL SERVICES: Any type of professional service performed by an independent contractor within the practice of accounting, actuarial services, architecture, dentistry, land surveying, landscape architecture, law, medicine, optometry, pharmacy, or professional engineering (which shall be procured as set forth in the Code of Virginia). **2.2-4301**

PROPOSAL: The document submitted by the offeror in response to the RFP to be used as the basis for negotiations for entering into a contract.

PURCHASING AGENT: The individual employed and given authority by the Harrisonburg City Council by adoption of the City of Harrisonburg Purchasing and Contracting Policy Manual. Purchasing Agent may also be referred to as Procurement Manager.

REQUEST FOR PROPOSAL (RFP): A formal request for a proposal from prospective offerors which will indicate the general terms which are sought to be procured from the offeror and where negotiations are conducted to come to a final contract. The RFP will specify the evaluation criteria to be used and will contain or incorporate by reference other contractual terms and conditions applicable to the procurement.

RESPONSIBLE BIDDER/OFFEROR: An individual, company, firm, corporation, partnership or other organization having the capability in all respects to perform fully the contract requirements, and also having the moral and business integrity and reliability which will assure good faith performance.

RESPONSIVE BIDDER/OFFEROR: An individual, company, firm, corporation, partnership or other organization having submitted a bid/proposal which conforms in all material respects to the ITB or RFP.

SOLICITATION: A formal document issued by the City with the intent to purchase goods, services or construction. Can be either an Invitation To Bid or a Request For Proposal.

SWAM: Small, Women, and Minority-owned businesses.

SUBCONTRACTOR: A business entity that has a contract to supply labor or materials to the prime contractor to whom the contract was awarded or to any subcontractor in the performance of the work provided for in such contract.

CONDITIONS OF BIDDING

BID PRICE CURRENCY: Unless stated otherwise in the solicitation, bidders/offerors shall state bid/proposal prices in US dollars.

BID/PROPOSAL ACCEPTANCE PERIOD: Unless otherwise specified, all bids/proposals submitted shall be binding and may not be withdrawn for sixty (60) days following the bid/proposal opening date and time, unless extended by mutual consent of all parties. If the bid/proposal is not withdrawn at that time it remains in effect until an award is made or the solicitation is cancelled.

CANCELLATION OF SOLICITATIONS: 2.2-4319 An ITB, RFP or any other solicitation may be cancelled or rejected, but shall not be cancelled or rejected solely to avoid awarding a contract to a particular responsive and responsible bidder/offeror. The reasons for cancellation shall be made part of the contract file.

CITY HALL CLOSURE: If City Hall is closed for business at the time scheduled for the bid opening, for whatever reasons, sealed bid/proposal will be accepted and opened on the next business day of the City, at the original scheduled hour.

CLARIFICATION of TERMS: If any prospective bidder/offeror has questions about the specifications or other solicitation documents, the prospective bidder/offeror should contact the person identified in the solicitation no later than five (5) business days before the due date. Any revisions to the solicitation will be made only by addendum issued by the City.

CONFLICT OF INTEREST/COLLUSION: Contractor certifies by signing their bid/proposal submission to the City, that no conflict of interest or collusion exists between the Contractor and City that interferes with fair competition and no conflict of interest or collusion exists between Contractor and any other person or organization that constitutes a conflict of interest with respect to the contract with the City.

DEBARMENT STATUS: By signing their bid/proposal, the bidders/offerors certify that they are not currently debarred from submitting bids/proposals on contracts from any agency, public entity/locality or authority of the Commonwealth of Virginia.

DISCRIMINATION PROHIBITED: **2.2-4310** In the solicitation or awarding of a contract the City shall not discriminate against a bidder/offeror because of race, religion, color, sex, national origin, age, disability, status as a service disabled veteran, or any other basis prohibited by state law relating to discrimination in employment. The City encourages the participation of SWAM and Veteran-Owned businesses (as defined in 2.2-4310(F) in public procurement activities. Towards that end, the City encourages contractors to provide for the participation of SWAM/Veteran-Owned businesses through partnerships, joint ventures, subcontracts, and other contractual opportunities.

ERRORS IN BIDS/PROPOSALS: When an error is made in extending total prices, the unit price will govern. Bidders/Offerors are cautioned to recheck their bids/proposals for possible errors prior to submission.

ETHICS IN PUBLIC CONTRACTING: 2.2-4371 By submitting their bids/proposals, the bidders/offerors certify that their bids/proposals are made without collusion or fraud and that they have not offered or received any kickbacks or inducements from any other bidder/offeror, supplier, manufacturer or subcontractor in connection with their bid/proposal, and that they have not conferred on any public employee having official responsibility for this procurement transaction any payment, loan, subscription, advance, deposit of money, services or anything of more than nominal or minimal value, present or promised, unless consideration of substantially equal or greater value was exchanged.

EXCUSABLE DELAY: The City shall not be in default of any failure in performance of this agreement in accordance with its terms if such failure arises out of causes beyond its reasonable control and without the fault of or negligence of the City. Such causes may include, but are not restricted to acts of God or the public enemy, fires, flood, epidemics, quarantine restrictions, strikes, freight embargoes, and unusually severe weather, but in every case the failure to perform must be beyond the reasonable control and without the fault or negligence of the City.

LICENSES, PERMITS and FEES: All proposals submitted shall have included in price the cost of any business or professional licenses, permits or fees required by the City of Harrisonburg or the Commonwealth of Virginia. At or prior to delivery of the signed contract, the bidder/offeror to whom the contract is awarded shall deliver to the City a copy of their City Business License (if applicable). The bidder/offeror shall ensure that the Business License indicates a basis amount equal to or greater than the awarded Contract value. For information on City Business Licenses contact the Harrisonburg Commissioner of the Revenue's office at 540-432-7704. The bidder/offeror must have all necessary licenses to perform the services in the Commonwealth of Virginia and, if practicing as other than an individual, be authorized to do business in the Commonwealth of Virginia.

MANDATORY USE of CITY FORMS AND TERMS and CONDITIONS for ITBs AND RFPs: Failure to submit a bid/proposal on the official City form(s) provided or in the format identified, for that purpose shall be a cause for rejection of the bid/proposal. Unauthorized modification of or additions to any portion of the ITB or RFP may be cause for rejection of the bid/proposal. The City reserves the right to decide, on a case by case basis, in it's sole discretion, whether to reject any bid/ proposal which has been modified. As a precondition to its acceptance of an ITB response, the City may, in its sole discretion, request that the bidder withdraw or modify nonresponsive portions of a bid which do not affect quality, quantity, price, or delivery. No modification to the provisions of the contract shall be effective unless the modification is incorporated into the contract document.

MODIFICATION & WITHDRAWAL OF BIDS/PROPOSALS: 2.2-4330

1. A bidder for a public construction contract, other than a contract for construction or maintenance of public highways, may withdraw his bid from consideration if the price bid was substantially lower than the other bids due solely to a mistake in the bid, provided the bid was submitted in good faith, and the mistake was a clerical mistake as opposed to a judgment mistake, and was actually due to an unintentional arithmetic error or an unintentional omission of a quantity of work, labor or material made directly in the compilation of a bid, which unintentional arithmetic error or unintentional omission can be clearly shown by objective evidence drawn from inspection of original work papers, documents and materials used in the preparation of the bid sought to be withdrawn.

   If a bid contains both clerical and judgment mistakes, a bidder may withdraw his bid from consideration if the price bid would have been substantially lower than the other bids due solely to the clerical mistake, that was an unintentional arithmetic error or an unintentional omission of a quantity of work, labor or material made directly in the compilation of a bid that shall be clearly shown by objective evidence drawn from inspection of original work papers, documents and materials used in the preparation of the bid sought to be withdrawn.
2. The bidder shall give notice in writing of his claim of right to withdraw his bid within two business days after the conclusion of the bid opening procedure and shall submit original work papers with such notice.
3. No bid shall be withdrawn under this section when the result would be the awarding of the contract on another bid of the same bidder or of another bidder in which the ownership of the withdrawing bidder is more than five percent.
4. If a bid is withdrawn in accordance with this section, the lowest remaining bid shall be deemed to be the low bid.
5. No bidder who is permitted to withdraw a bid shall, for compensation, supply any material or labor to or perform any subcontract or other work agreement for the person or firm to whom the contract is awarded or otherwise benefit, directly or indirectly, from the performance of the project for which the withdrawn bid was submitted.
6. The public body shall notify the bidder in writing within five business days of its decision regarding the bidder's request to withdraw its bid. If the public body denies the withdrawal of a bid under the provisions of this section, it shall state in such notice the reasons for its decision and award the contract to such bidder at the bid price, provided such bidder is a responsible and responsive bidder. At the same time that the notice is provided, the public body shall return all work papers and copies thereof that have been submitted by the bidder.
7. These procedures also apply for the withdrawal of bids for other than construction contracts.
8. A bidder/offeror may modify or withdraw his bid/proposal, either personally or by written request to the Purchasing office at any time prior to the scheduled time for opening of bids/proposals.

PUBLIC INSPECTION OF CERTAIN RECORDS: 2.2-4342 Public inspection of all records is strictly governed by Code of Virginia 2.2-4342 and in accordance with the Virginia Freedom of Information Act (VA Code 2.2-3700 et seq). Any inspection of procurement transactions shall be subject to reasonable restrictions to ensure the security and integrity of the records. Cost estimates relating to a proposed procurement transaction prepared by or for a public body shall not be open to public inspection.

REVISIONS to the OFFICIAL ITB/RFP: No bidder/offeror shall modify, revise, edit or make any unauthorized change(s) to the original official ITB/RFP. The official solicitation document and the Addenda(um) are the documents posted on the City of Harrisonburg's web site, www.harrisonburgva.gov/bids-proposals. Any such violation as stated above may result in rejection of the ITB/RFP response. In addition, violations may result in the debarment of the bidder/offeror by the City of Harrisonburg.

TAXES: Sales to the City of Harrisonburg are normally exempt from State sales tax. Virginia Sales and Use Tax Certificate of Exemption, Form ST-12, will be issued upon request. The City may also be exempt from other taxes and fees.

AWARD

CONTRACT AWARD

For ITB: The award(s) made in response to an ITB will be made to the lowest responsive and responsible bidder(s) for each item, or group of items indicated in the bid. The City reserves the right to make the sole determination of whether the product and/or options offered meet the minimum specifications and is acceptable in accordance with the specifications. The City's decision shall be final. The City reserves the right to make a separate award for each item, a group of items or all items, and to make awards either in whole or in part, whichever is deemed by the City to be in its best interest. Delivery time lines may be a factor in making an award.

For RFP: The award(s) made in response to an RFP will be made to the highest qualified offeror whose proposal is determined to be the most advantageous to the City, taking into consideration the evaluation criteria set forth in the RFP. After negotiations, the offeror who has made the best proposal and provides the best value shall be awarded the contract.

Professional services shall be procured and awarded by competitive negotiation as set forth in **2.2-4302.2 A 4.**

The City reserves the right to cancel a solicitation at any time and to reject any or all bids/proposals, in whole or in part, to waive any informality and to delete items prior to making the award(s), whenever it is deemed in the sole opinion of the City to be in its best interest.

NEGOTIATION WITH THE LOWEST BIDDER: 2.2-4318 Unless all bids are canceled or rejected, the City reserves the right to negotiate with the lowest responsive and responsible bidder to obtain a contract price within the funds available to the City whenever such low bid exceeds the City's available funds for the project. The City shall initiate such negotiations by written notice to the lowest responsive, responsible bidder that its bid exceeds the available funds and the City wishes to negotiate a lower contract price. The times, places and manner of negotiating shall be agreed to by the City and the lowest responsive, responsible bidder.

PRECEDENCE of TERMS: General Terms and Conditions shall apply in all instances with the exceptions for projects funded by the Federal Highway Administration (FHWA) and by the Federal Transportation Administration (FTA). In the event there is a conflict between the General Terms and Conditions and any Federal, Special, Standard, or Supplementary Terms and Conditions in this solicitation, the Federal, Special, Standard, or Supplementary Terms and Conditions shall apply.

QUALIFICATIONS of BIDDERS/OFFERORS: The City may make such reasonable investigations as deemed proper and necessary to determine the responsibility and ability of the bidder/offeror to perform the services/furnish the goods and the bidder/offeror shall furnish to the City all such information and data for this purpose as may be requested. The City reserves the right to inspect bidder's/offeror's physical facilities prior to award to satisfy questions regarding the bidder's/offeror's capabilities. The City further reserves the right to reject any bid/proposal if the evidence submitted by, or investigations of, such bidder/offeror fails to satisfy the City that such bidder/offeror is properly qualified to carry out the obligations of the contract and to provide the services and/or furnish the goods contemplated therein.

SELECTION PROCESS/NOTICE OF AWARD: Upon the award or the announcement of the decision to award a contract as a result of this solicitation, the Purchasing office will publicly post such notice and/or will notify all responsive bidders/offerors. The City posts all Notice of Awards on its website at www.harrisonburgva.gov/bids-proposals-award-notifications and also on eVA at www.eva.virginia.gov.

CONTRACT PROVISIONS

ANTI-DISCRIMINATION: 2.2-4311 By submitting their bids/proposals, bidders/offerors certify to the City that they will conform to the provisions of the Federal Civil Rights Act of 1964, as amended, as well as the Virginia Fair Employment

Contracting Act of 1975, as amended, where applicable, the Virginians With Disabilities Act, the Americans With Disabilities Act.

In every contract over $10,000 the provisions below apply:

1. During the performance of this contract, the contractor agrees as follows:
   a. The contractor will not discriminate against any employee or applicant for employment because of race, religion, color, sex, national origin, age, disability, or any other basis prohibited by state law relating to discrimination in employment, except where there is a bona fide occupational qualification reasonably necessary to the normal operation of the contractor. The contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices setting forth the provisions of this nondiscrimination clause.
   b. The contractor, in all solicitations or advertisements for employees placed by or on behalf of the contractor, will state that such contractor is an equal opportunity employer.
   c. Notices, advertisements and solicitations placed in accordance with federal law, rule or regulation shall be deemed sufficient for the purpose of meeting these requirements.
2. The contractor will include the provisions of 1. above in every subcontract or purchase order over $10,000, so that the provisions will be binding upon each subcontractor or vendor.

ANTITRUST: By entering into a contract, the contractor conveys, sells, assigns, and transfers to the City all rights, title and interest in and to all causes of action it may now have or hereafter acquire under the antitrust laws of the United States and the Commonwealth of Virginia, relating to the particular goods or services purchased or acquired by the City under said contract.

APPLICABLE LAWS and COURTS: This solicitation and any resulting contract shall be governed in all respects by the laws of the Commonwealth of Virginia, excluding its conflict of laws provisions, and venue for litigation with any respect thereto shall be proper only in the Circuit Court of Rockingham County, Virginia. The contractor shall comply with all applicable federal, state and local laws, rules and regulations.

ASSIGNMENT of CONTRACT: A contract shall not be assignable by the contractor in whole or in part without the written consent of the City.

CHANGES to the CONTRACT: Changes can be made to the contract in any of the following ways:

1. The parties by mutual agreement in writing, to modify the terms, conditions or scope of the contract subject to item 2. below. Any additional goods or services to be provided shall be of a sort that is ancillary to the contract goods or services, or within the same broad product or service categories as were included in the contract award. Any increase or decrease in the price of the contract resulting from such modification shall be agreed to by the parties as a part of their written agreement to modify the scope of the contract.
2. A public contract may include provisions for modification of the contract during performance, but no fixed-price contract may be increased by more than twenty-five percent (25%) of the amount of the contract or $50,000, whichever is greater, without the advance written approval of the Harrisonburg City Council. In no event may the amount of any contract, without adequate consideration, be increased for any purpose, including, but not limited to, relief of a bidder/offeror from the consequences of an error in its (bid/offer). **2.2-4309**
3. The Procurement Manager (or City delegated agent) may order changes within the general scope of the contract at any time by written notice to the contractor. Changes within the scope of the contract include, but are not limited to, things such as services to be performed, the method of packing or shipment, and the place of delivery or installation. The contractor shall comply with the notice upon receipt unless the contractor intends to claim an adjustment to compensation, schedule, or other contractual impact that would be caused by complying with such notice, in which case the contractor shall, in writing, promptly notify the City of the adjustment to be sought, and before proceeding to comply with the notice, shall await the City's written decision affirming, modifying, or revoking the prior written notice. If the City decides to issue a notice that requires an adjustment to compensation, the contractor shall be compensated for any additional costs incurred as the result of such order and shall give the City a credit for any savings. Said compensation shall be determined by one of the following methods:
   a. By mutual agreement between the parties in writing; or
   b. By agreeing upon a unit price or using a unit price set forth in the contract, if the work to be done can be expressed in units, and the contractor accounts for the number of units of work performed, subject to the City's right to audit the contractor's records and/or to determine the correct number of units independently; or
   c. By ordering the contractor to proceed with the work and keep a record of all costs incurred and savings realized. A markup for overhead and profit may be allowed if provided by the contract. The same markup shall be used for determining a decrease in price as the result of savings realized. The contractor shall present the City with all vouchers and records of expenses incurred and savings realized. The City shall have the right to audit the records of the contractor as it deems necessary to determine costs or savings. Any claim for an adjustment in price under this provision must be asserted by written notice to the City within thirty (30) days from the date of receipt of the written order from the City. If the parties fail to agree on an amount of adjustment, the question of an increase or decrease in the contract price or time for performance shall be resolved in accordance with the procedures for resolving disputes provided by the Disputes

Clause of this contract or, if there is none, in accordance with the disputes provisions of the City of Harrisonburg Purchasing and Contracting Policy Manual. Neither the existence of a claim nor a dispute resolution process, litigation or any other provision of this contract shall excuse the contractor from promptly complying with the changes ordered by the City or with the performance of the contract generally.

CONTRACT EXECUTION: Per City Code (Sec 3-1-2, 3-1-1), the City Manager and the Deputy City Manager shall have authority to execute all contracts and agreements on behalf of the City except as otherwise directed by the Harrisonburg City Council in specific instances.

CONTRACTUAL DISPUTES: Contractual claim procedures shall be as per Code of VA **2.2-4363**.

COOPERATIVE PROCUREMENT: 2.2-4304 Except as prohibited by the current Code of Virginia 2.2-4304, all resultant contracts will be extended, with the authorization of the contractor, to other public bodies to permit their ordering of supplies and/or services at the prices and terms of the resulting contract. If any other public body decides to use the final contract, the Contractor must deal directly with that public body concerning the placement or orders, issuance of the purchase order, contractual disputes, invoicing and payment. The City acts only as the "Contracting Officer" for these public bodies. Any resulting contract with other public bodies shall be governed by the laws of that specific entity. It is the Contractor's responsibility to notify the public bodies of the availability of the contract. The City shall not be held liable for any costs or damage incurred by another public body as a result of any award extended to that public body by the Contractor.

DEFAULT: In case of failure to deliver goods or services in accordance with the contract terms and conditions, the City, after due oral or written notice, may procure items of a comparable quality from other sources and hold the contractor responsible for any resulting additional costs above the contract price when purchases are made in the open market. This remedy shall be in addition to any other remedies, which the City may have.

DRUG-FREE WORKPLACE: 2.2-4312 During the performance of this contract, the contractor agrees to: (i) provide a drug-free workplace for the contractor's employees; (ii) post in conspicuous places, available to employees and applicants for employment, a statement notifying employees that the unlawful manufacture, sale, distribution, dispensation, possession, or use of a controlled substance or marijuana is prohibited in the contractor's workplace and specifying the actions that will be taken against employees for violations of such prohibition; (iii) state in all solicitations or advertisements for employees placed by or on behalf of the contractor that the contractor maintains a drug-free workplace; and (iv) include the provisions of the foregoing clauses in every subcontract or purchase order of over $10,000, so that the provisions will be binding upon each subcontractor or vendor.

IMMIGRATION REFORM and CONTROL ACT OF 1986: 2.2-4311.1 By submitting their bids/proposals, bidders/offerors certify that they do not and will not during the performance of this contract employ illegal alien workers or otherwise violate the provisions of the federal Immigration Reform and Control Act of 1986.

INDEMNIFICATION: Contractor agrees to indemnify, defend and hold harmless the City, its officers, agents, volunteers, and employees from any claims, damages and actions of any kind or nature, whether at law or in equity, arising from or caused by the use of any materials, goods, or equipment of any kind or nature furnished by the contractor/any services of any kind or nature furnished by the contractor, provided that such liability is not attributable to the sole negligence of the using agency or to failure of the using agency to use the materials, goods, or equipment in the manner already and permanently described by the contractor on the materials, goods or equipment delivered.

INSURANCE: By signing and submitting a bid/proposal under this solicitation, the bidder/offeror certifies that if awarded the contract, it will have insurance coverages per the solicitation document at the time of contract execution. For construction contracts, if any subcontractors are involved, the subcontractor will have workers' compensation insurance in accordance with **2.2-4332** and **65.2-800** et seq. of the Code of Virginia. The bidder/offeror further certifies that the contractor and any subcontractors will maintain these insurance coverages during the entire term of the contract and that all insurance coverages will be provided by insurance companies authorized to sell insurance in Virginia by the Virginia State Corporation Commission.

LIABILITY AND LITIGATION: The City shall not indemnify or hold harmless any contractor or other third party. The City does not waive any right or release any party from liability, whether on its own behalf or on behalf of any boards, employees or agents. The City does not waive the right to trial by jury for any cause of action arising from the contract and shall not submit any contract claim to binding arbitration or mediation. The City shall not be liable to contractor for any special, punitive or exemplary damages arising from the performance of the contract, including, but not limited to, incidental damages, and lost profit and lost wages, even if such special damages are reasonably foreseeable. Any provision(s) in the contract contrary to these statements is/are hereby deleted and rendered void.

NONDISCRIMINATION OF CONTRACTORS: 2.2-4343.1H A bidder, offeror, or contractor shall not be discriminated against in the solicitation or award of this contract because of race, religion, color, sex, national origin, age, disability, faith-based organizational status, any other basis prohibited by state law relating to discrimination in employment or because the bidder or offeror employs ex-offenders unless the state agency, department or institution has made a written determination that employing ex-offenders on the specific contract is not in its best interest. If the award of this contract is made to a faith-based organization and an individual, who applies for or receives goods, services, or disbursements provided pursuant to this contract objects to the religious character of the faith-based organization from which the individual receives or would receive the goods, services, or disbursements, the public body shall offer the individual, within a reasonable period of time after the date of his objection, access to equivalent goods, services, or disbursements from an alternative provider.

PAYMENT: 2.2-4352 – 2.2-4354

1. To Prime Contractor:
   Invoices for items ordered, delivered and accepted shall be submitted by the contractor directly to the payment address shown on the purchase order/contract. Any payment terms requiring payment in less than 45 days will be regarded as requiring payment 45 days after invoice or delivery, whichever occurs last. This shall not affect offers of discounts for payment in less than 45 days, however. All goods or services provided under this contract or purchase order, that are to be paid for with public funds, shall be billed by the contractor at the contract price.

   The following shall be deemed to be the date of payment: the date of postmark in all cases where payment is made by mail, or the date of offset when offset proceedings have been instituted as authorized under the Virginia Debt Collection Act. Individual contractors shall provide their social security numbers, and proprietors, partnerships, and corporations shall provide the City with a federal employer identification number, prior to receiving any payment from the City. The City requires an updated IRS Form W-9 be filed with the Purchasing Office at or before the contract is signed.

   Unreasonable Charges: Under certain emergency procurements and for most time and material purchases, final job costs cannot be accurately determined at the time orders are placed. In such cases, contractors should be put on notice that final payment in full is contingent on a determination of reasonableness with respect to all invoiced charges. Charges which appear to be unreasonable will be researched and challenged, and that portion of the invoice held in abeyance until a settlement can be reached. Upon determining that invoiced charges are not reasonable, the City shall promptly notify the contractor, in writing, as to those charges which it considers unreasonable and the basis for the determination. A contractor may not institute legal action unless a settlement cannot be reached within thirty (30) days of notification.

   The provisions of this section do not relieve the City of its prompt payment obligations with respect to those charges which are not in dispute **(2.2.4363).**

2. To Subcontractors:
   A contractor awarded a contract under this solicitation is hereby obligated to pay the subcontractor(s) within seven (7) days of the contractor's receipt of payment from the City for the proportionate share of the payment received for work performed by the subcontractor(s) under the contract; or;

   Notify the City and the subcontractor(s), in writing, of the contractor's intention to withhold payment and the reason.
   The contractor is obligated to pay the subcontractor(s) interest at the rate of one percent per month (unless otherwise provided under the terms of the contract) on all amounts owed by the contractor that remain unpaid seven (7) days following receipt of payment from the City, except for amounts withheld as stated in (2) above. The date of mailing of any payment by U. S. Mail is deemed to be payment to the addressee. These provisions apply to each sub-tier contractor performing under the primary contract. A contractor's obligation to pay an interest charge to a subcontractor may not be construed to be an obligation of the City. Any such contract awarded shall further require the contractor to 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. A contractor's obligation to pay an interest charge to a subcontractor may not be construed to be an obligation of the City.

SAFETY and OSHA STANDARDS: All parties performing services for the City shall comply with all Occupational Safety and Health Administration (OSHA), State Occupational Health Standards, and any other applicable rules and regulations. All parties shall be held responsible for the training, supervision, and safety of their employees. Any unsafe acts or hazardous conditions that may cause injury or damage to any persons or property within and around the work site areas under this contract shall be remedied per the regulatory agency's guidelines.

STATE CORPORATION COMMISSION IDENTIFICATION NUMBER: Pursuant to Code of Virginia **2.2-4311.2** subsection B, a bidder/offeror organized or authorized to transact business in the Commonwealth pursuant to Title 13.1 or Title 50 is required to include in its bid/proposal the identification number issued to it by the State Corporation Commission (SCC) and shall not allow the identification number to lapse, be revoked or cancelled at any time during the term of the contract. Any

bidder/offeror that is not required to be authorized to transact business in the Commonwealth as a foreign business entity under Title 13.1 or Title 50 or as otherwise required by law is required to include in its bid/proposal a statement describing why the bidder/offeror is not required to be so authorized. A link to the SCC site is at http://www.scc.virginia.gov.

TERMINATION: Subject to the provisions below, the contract may be terminated by the City upon thirty (30) days advance written notice to the other party. Any contract cancellation notice shall not relieve the contractor of the obligation to deliver and perform on all outstanding orders issued prior to the effective date of cancellation.

1. Termination for Convenience: In the event that the contract is terminated upon request and for the convenience of the City, without the required thirty (30) days advance notice, then the City shall be responsible for payment of services up to the termination date.
2. Termination for Cause: Termination by the City for cause, default or negligence on the part of the contractor shall be excluded from the foregoing provision; termination costs, if any shall not apply. However, the City may hold the contractor responsible for any resulting additional purchase and administrative costs. The thirty (30) day advance notice requirement is waived in the event of Termination for Cause.
3. Termination Due to Unavailability of Funds: Agreements are made subject to the appropriation of funds (including grant funds, gifts or donations) by the Harrisonburg City Council and are null and void in the event of non-appropriation by the City Council. Non-appropriation of funds shall not be deemed a cancellation and shall terminate this agreement without recourse and with no liability on the part of the City.

SPECIFICATIONS

CONDITION OF ITEMS: Unless otherwise specified in the solicitation, all items shall be new, latest edition/model in first class condition.

FORMAL SPECIFICATIONS: When a solicitation contains a specification which states no substitutes, no deviation therefrom will be permitted and the bidder will be required to furnish articles in conformity with that specification.

USE OF BRAND NAMES: 2.2-4315 Unless otherwise provided in this solicitation, the name of a certain brand, make or manufacturer does not restrict bidders/offerors to the specific brand, make or manufacturer named, but conveys the general style, type, character, and quality of the article desired. Any article which the public body, in its sole discretion, determines to be the equal of that specified, considering quality, workmanship, economy of operation, and suitability for the purpose intended, shall be accepted. The bidder/offeror is responsible to clearly and specifically identify the product being offered and to provide sufficient descriptive literature, catalog cuts and technical detail to enable the City to determine if the product offered meets the requirements of the solicitation. This is required even if offering the exact brand, make or manufacturer specified. Normally in competitive sealed bidding only the information furnished with the bid will be considered in the evaluation. Failure to furnish adequate data for evaluation purposes may result in declaring a bid nonresponsive. Unless the bidder/offeror clearly indicates in its bid/proposal that the product offered is an "equal" product, such bid/proposal will be considered to offer the brand name product referenced in the solicitation. The City reserves the right to determine the suitability of substituted items for those specified and to accept in whole or in part any and all bids/proposals received.

DELIVERY

DEFECTS OR IMPROPRIETIES: In instances where there is a defect or impropriety in an invoice or in the goods or services received, the City shall notify the supplier of the defect or impropriety, if the defect or impropriety would prevent payment by the payment date. The notice shall be sent within (30) thirty days after receipt of the invoice or the goods or services.

TESTING AND INSPECTION: 2.2-4302.1 The City reserves the right to conduct any test/inspection it may deem advisable to assure goods and services conform to the specifications. Materials or components that have been rejected by the City, in accordance with the terms of the contract, shall be replaced by the Contractor at no cost to the City.

TRANSPORTATION AND PACKAGING: All materials shipped to the City must be shipped Free On Board (FOB) Destination unless otherwise stated in the contract. By submitting their bids/proposals, all bidders/offerors certify and warrant that the price offered for FOB destination includes only the actual freight rate costs at the lowest and best rate and is based upon the actual weight of the goods to be shipped. Except as otherwise specified herein, standard commercial packaging, packing and shipping containers shall be used. All shipping containers shall be legibly marked or labeled on the outside with purchase order number, commodity description, and quantity.

0401 ESCROW ACCOUNT ELECTION

ELECTION OF ESCROW ACCOUNT PROCEDURE FOR RETAINAGE

If determined to be the successful low bidder(s), the below signed elects to use the Escrow Account Procedure for retainage.

_____

Write "Yes" or "No" on above line

If the successful bidder elects to use the Escrow Account Procedure for Retainage, an "Escrow Agreement" form will be provided by the City and shall be executed and submitted to the City within fifteen (15) calendar days after notification. If the "Escrow Agreement" form is not submitted within the fifteen (15) day period, the Contractor shall forfeit his rights to the use of the Escrow Account Procedure.

Company_____

Authorized Signature_____

0401 ESCROW AGREEMENT
CITY OF HARRISONBURG, VIRGINIA

THIS AGREEMENT ("Agreement"), made and entered into this _____ day of _____, 20_____ by, between and among the City of Harrisonburg, Virginia ("City" or Owner"), _____("Contractor"), _____(Name of Escrow Agent) _____(Address of Escrow Agent) a trust company, bank, or savings and loan institution (hereinafter referred to collectively as "Escrow Agent") with its principal office located in the Commonwealth of Virginia ("Commonwealth") and _____("Surety") provides:

I.

The City and the Contractor have entered into a contract dated _____ with respect to City of Harrisonburg ITB No. _____ , for _____ _____("Contract"). This Agreement is pursuant to, but in no way amends or modifies, the Contract. Payments made hereunder or the release of funds from escrow shall not be deemed approval or acceptance of performance by the Contractor. Payments should be made to _____ and mailed to _____ _____(Name and Address of Escrow Agent).

II.

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

III.

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

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

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

IV.

Upon receipt of checks drawn by the City and made payable to the Escrow Agent under this agreement, the Escrow Agent shall promptly notify the Contractor, negotiate the same and deposit or invest and reinvest the proceeds in approved securities in accordance with the written instructions of the Contractor. In no event shall the Escrow Agent invest the escrowed funds in any security not approved, as set forth in Section V. below.

V.

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

(1) United States Treasury Bonds, United States Treasury Notes, United States Treasury Certificates of Indebtedness or United States Treasury Bills,

(2) Bonds, notes and other evidences of indebtedness unconditionally guaranteed as to the payment of principal and interest by the United States,

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

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

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

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

No security is approved hereunder which matures more than five (5) years after the date of its purchase by the Escrow Agent or deposit by the Contractor.

VI.

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

Upon receipt of a direction signed by the City of Harrisonburg Director of Finance or designee, the Escrow Agent shall pay the principal of the fund, or any specified amount thereof, to the City or the Contractor as the City may direct. If payment is to be made to the Harrisonburg City Treasurer, it shall be made in cash or cash equivalent. However, if payment has been authorized to be made to the Contractor, the Contractor may specify to the Escrow Agent if payment is to be made in cash or in kind. Any such payment and delivery required hereunder shall be made as soon as is practicable after receipt of the direction.

VII.

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

VIII.

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

IX.

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

X.

This Escrow Agreement shall be governed by, and construed in accordance with, the laws of the Commonwealth of Virginia, without application of Virginia’s conflict of law provisions. Venue and any actions for any litigation, suits, and claims arising from or connected with this Escrow Agreement and/or Contract referred to herein shall only be proper in the Rockingham County Circuit Court, or in the Rockingham County General District Court if the amount in controversy is within the jurisdictional limit of such court, and all parties to this Escrow Agreement and/or such Contract voluntarily submit themselves to the jurisdiction and venue of such courts, regardless of the actual location of such parties.

SIGNATURE PAGE TO FOLLOW

IN WITNESS WHEREOF, the parties hereto have signed this Escrow Agreement by their authorized representatives.

Typed Name of Contractor

Attest: (if corporation)
Witness: (if individual)

President/Vice-President;
Partner or Owner (Seal

Typed Name of Escrow Agent

Attest:

Bank Officer

Vice President

Witness:

Typed Name of Surety Company

By:_____
Attorney-In-Fact

Attest:

City of Harrisonburg, Virginia

City Clerk

City Manager/Deputy City Manager

Approved as to form:

City Attorney

Approved as to execution:

City Attorney

0501 AGREEMENT

This AGREEMENT is dated as of the ___ day of _____ in the year 20__ between the City of Harrisonburg, Virginia (hereinafter called OWNER) and _____ (hereinafter called CONTRACTOR). OWNER and CONTRACTOR, in consideration of the mutual covenants hereinafter set forth, agree as follows:

ARTICLE 1. WORK

CONTRACTOR shall complete all Work as specified or indicated in the Contract Documents for the project titled City of Harrisonburg, Virginia, Bluestone Trail Extension. The Work is generally described as follows:

Construction of multi-use trail, curb & gutter, CG-12 detectible warning surface, concrete entrances, and utility relocations and incidental items required to complete the work.

ARTICLE 2. CONTRACT ADMINSTRATOR

This Project has been designed by Vanasse Hangen Brustlin, Inc. and administered by the Department of Public Works. The Director of Public Works of Harrisonburg, Virginia, or their designee, is hereinafter called CONTRACT ADMINSTRATOR, will assume all duties and responsibilities and will have the rights and authority assigned to CONTRACT ADMINSTRATOR in the Contract Documents in connection with completion of the Work in accordance with the Contract Documents.

ARTICLE 3. CONSTRUCTION TIME AND LIQUIDATED DAMAGES

3.1 Contract Time shall be Fixed Completion Dates for the various phases of work as follows:

All work shall be completed by August 11, 2017.

3.2 Consideration for time extensions attributable to weather will not be given except as provided for in Section 108.04 of the VDOT Standard Specifications.

3.3 Liquidated Damages shall be in accordance with Section 108 of the VDOT Road and Bridge Specifications.

ARTICLE 4. CONTRACT PRICE

4.1 OWNER shall pay CONTRACTOR for performance of the Work in accordance with the Contract Documents such amounts as required by the Contract Documents.

ARTICLE 5. PAYMENT PROCEDURES

CONTRACTOR shall submit Applications for Payment in accordance with Virginia Department of Transportation's Road & Bridge Specifications. Applications for Payment will be processed by CONTRACT ADMINSTRATOR as provided in the Virginia Department of Transportation's Road & Bridge Specifications.

5.1 Progress Payments. OWNER shall make progress payments on account of the Contract Price on the basis of CONTRACTOR'S Applications for Payment as recommended by CONTRACT ADMINSTRATOR, on or about the 1st day of each month during construction as provided below. All Progress Payments will be on the basis of the progress of the Work measured by the schedule of values established in Virginia Department of Transportation's Road & Bridge Specifications.

5.1.1 Prior to completion Progress Payments will be made in an amount equal to:

95% of the Work completed, and

95% of the materials and equipment not incorporated in the Work but delivered and suitably stored less in each case the aggregate of payment previously made.

5.1.2 Upon substantial completion, OWNER shall pay amount sufficient to increase total payments to CONTRACTOR to 98% of the Contract Price, less such amount as CONTRACT ADMINSTRATOR shall determine in accordance with Virginia Department of Transportation's Road & Bridge Specifications.

5.2. Final Payment. Upon final completion and acceptance of the Work in accordance with the Virginia Department of Transportation's Road & Bridge Specifications, OWNER shall pay the remainder of the Contract Price, as recommended by CONTRACT ADMINSTRATOR as provided in said Virginia Department of Transportation's Road & Bridge Specifications.

ARTICLE 6. INTEREST

All monies not paid when due hereunder shall bear interest at maximum rated allowed by law at the place of the Project.

ARTICLE 7. CONTRACTOR'S REPRESENTATIONS

In order to induce OWNER to enter into this Agreement, CONTRACTOR makes the following representations:

7.1 CONTRACTOR has familiarized himself with the nature and extent of the Contract Documents, Work, locality, and with all local conditions, state and local laws, ordinances, rules and regulations that in any manner may affect cost, progress or performance of the Work.

7.2 CONTRACTOR has studied carefully all reports of investigations and tests of subsurface and latent physical conditions at the site or otherwise affecting cost, progress or performance of the

Work which were relied upon by CONTRACT ADMINSTRATOR in the preparation of the Drawings and Specifications and which have been identified in the Supplementary Conditions.

7.3 CONTRACTOR has made or caused to be made examinations, investigations and tests and studies of such reports and related data in addition to those referred to in Paragraph 7.2. as he deems necessary for the performance of the Work at the Contract Price, within the Contract Time and in accordance with the other terms and conditions of the Contract Documents; and no additional examination, investigations, tests, reports or similar data are or will be required by CONTRACTOR for such purposes.

7.4 CONTRACTOR has correlated the results of all such observations, examinations, investigations, tests, reports and data with the terms and conditions of the Contract Documents.

7.5 CONTRACTOR has given CONTRACT ADMINSTRATOR written notice of all conflicts, errors or discrepancies that he has discovered in the Contract Documents and the written resolution thereof by CONTRACT ADMINSTRATOR is acceptable to CONTRACTOR.

ARTICLE 8. CONTRACT DOCUMENTS

The Contract Documents which comprise the entire agreement between OWNER and CONTRACTOR are attached by reference to this Agreement, made a part hereof and consist of the following:

8.1 This Agreement (pages 1 to 5, inclusive)

8.2 Performance and Payment bonds

8.3 Certificate of Insurance and Endorsement

8.4 Notice of Award

8.5 Notice to Proceed

8.6 State Requirements

8.7 Project Manual entitled “Bluestone Trail Extension”

8.8 Drawings, consisting of a cover sheet and sheets numbered 1 through 35

8.9 Signed Addenda

8.10 Contractor’s Bid

8.11 Documentation submitted by Contractor prior to Notice of Award.

8.12 Any modifications or change orders, duly delivered after execution of Agreement.

All contract documents must be listed in this article. Contract documents may be altered, amended or repealed only as allowed by the Virginia Department of Transportation's Road & Bridge Specifications.

ARTICLE 9. MISCELLANEOUS

9.1 No assignment by a party hereto of any rights under or interests in the Contract Documents will be binding on another party hereto without the written consent of the party sought to be bound; and specifically but without limitation, monies that may become due and monies that are now due may not be assigned without such consent (except to the extent that the effect of this restriction may be limited by law), and unless specifically stated to the contrary in any written consent to an assignment, no assignment will release or discharge the assignor from any duty or responsibility under the Contract Documents.

9.2 OWNER and CONTRACTOR each binds himself, his partners, successors, assigns and legal representatives to the party hereto, his partners, successors, assigns and legal representatives in respect to all covenants, agreements and obligations contained in the Contract Documents.

ARTICLE 10. OTHER PROVISIONS

IN WITNESS WHEREOF, the parties hereto have signed this Agreement in triplicate. One counterpart each has been delivered to OWNER, CONTRACTOR and CONTRACT ADMINSTRATOR. All portions of the Contract Documents have been signed or identified by OWNER and CONTRACTOR or by CONTRACT ADMINSTRATOR on their behalf.

OWNER: City of Harrisonburg	CONTRACTOR:_____
Signature_____	Signature_____
Name & Title: Kurt Hodgen, City Manager	Name & Title:_____
Attest _____	Attest_____
Address for giving notices:	Address for giving notices:
_____	_____
_____	_____
	License No._____

END OF AGREEMENT

0502 NOTICE TO PROCEED

DATE:_____

TO: _____

_____

_____

Re: **City of Harrisonburg**

PROJECT TITLE: _____

PROJECT NO: _____

In accordance with the Contract between the City of Harrisonburg and Contractor you are notified that the Time for Completion under the above Agreement will commence to run on _____ , 20 _____. By that date, you are to start performing your obligations under the Contract Documents. In accordance with the Contract between Owner and Contractor, the Work shall be substantially completed within _____ calendar days from and after the said date, which is _____, 20_____.

Before you may start any Work at the site, the City of Harrisonburg requires that you deliver to the City the Certificates of Insurance which the Contractor is required to purchase and maintain in accordance with the Contract Documents.

By _____
Owner Authorized Signature

_____
Name & Title (Print)

0800 APPLICATION FOR PAYMENT

1. Applications for progress payment shall be made on forms identical to those shown on pages 0800-2 and 0800-3. The following application for payment is an excel spreadsheet and will be made available for the contractor's use.

2. A draft of the application for progress payment shall be emailed to the Project Manager and Project Coordinator for review. After review and approval by the City, the contractor shall mail two signed applications for progress payment to: 320 East Mosby Road, Harrisonburg, VA 22801.

3. It shall be the responsibility of the Contractor to supply daily quantities to the Project Manager and Project Coordinator for comparison to the Inspector's quantities. The format shall be agreed upon during the pre-construction meeting.

0800 APPLICATION AND CERTIFICATE FOR PAYMENT

To Owner: City of Harrisonburg
320 E. Mosby Rd.
Harrisonburg, VA 22801

Project:

Application No.:

Period To:

From Contractor:

Contract Date:

1. Original Contract Sum	$
2. Net Change by Change Order	$
3. Contract Sum To Date (line 1 + line 2)	$
4. Total Completed and Stored To Date (column G)	$
5. Retainage:	
a. ___% of Completed Work (column D + column E)	$
b. ___% of Stored Materials (column F)	$
6. Total Earned Less Retainage (line 4 less line 5)	$
7. Less Previous Applications for Payment	$
8. Current Payment Due	$
9. Balance to Finish, Plus Retainage	$

CHANGE ORDER SUMMARY	Additions	Deductions
Total Changes Approved Previously		
Total Approved this Month		
Totals		
Net Changes by Change Order		

The undersigned contractor hereby swears and under penalty of perjury that (1) all previous progress payments received from the owner on account of work performed under the contract referred to above have been applied by the undersigned to discharge in full all obligations of the undersigned incurred in connection with work covered by prior applications for payment under said contract, being Applications for Payment 1 through _____ inclusive; and (2) all materials and equipment incorporated in said project or otherwise listed in or covered by this application for payment are free and clear of all liens, claims, security and encumbrances.

Signature _____ Date _____

Printed Name _____ Title _____

State of _____ County of _____

Before me this _____ day of _____, 20 __ personally appeared _____ known to me, who being duly sworn, did depose and say that he/she is the _____ of the contractor above mentioned, that he/she executed the above application for payment on behalf of said contractor and that all of the statements contained herein are true, correct and complete.

Notary Public _____ Registration No. _____

My Commission Expires _____

APPLICATION NO.: PERIOD TO: PROJECT:

A	B	C				D		E		F	G			H
LINE NO.	WORK DESCRIPTION	SCHEDULED VALUE				COMPLETED WORK PREVIOUS PERIOD		COMPLETED WORK THIS PERIOD		STORED MATERIAL (not in D or E)	TOTAL WORK COMPLETED TO DATE		% (G/C)	BALANCE TO COMPLETION (C-G)
		Unit	Qty.	Unit Price	Amount	Qty.	Total	Qty.	Total		Qty	Total		
1	MOBILIZATION	LS	1	$200.00	$200.00	0.50	$100.00	0.50	$100.00		1.00	$200.00	100%	$0.00
2					$0.00				$0.00		0.00	$0.00	#DIV/0!	$0.00
3					$0.00				$0.00		0.00	$0.00	#DIV/0!	$0.00
4					$0.00				$0.00		0.00	$0.00	#DIV/0!	$0.00
5					$0.00				$0.00		0.00	$0.00	#DIV/0!	$0.00
6					$0.00				$0.00		0.00	$0.00	#DIV/0!	$0.00
7					$0.00				$0.00		0.00	$0.00	#DIV/0!	$0.00
8					$0.00				$0.00		0.00	$0.00	#DIV/0!	$0.00
9					$0.00				$0.00		0.00	$0.00	#DIV/0!	$0.00
10					$0.00				$0.00		0.00	$0.00	#DIV/0!	$0.00
11					$0.00				$0.00		0.00	$0.00	#DIV/0!	$0.00
12					$0.00				$0.00		0.00	$0.00	#DIV/0!	$0.00
13					$0.00				$0.00		0.00	$0.00	#DIV/0!	$0.00
14					$0.00				$0.00		0.00	$0.00	#DIV/0!	$0.00
15					$0.00				$0.00		0.00	$0.00	#DIV/0!	$0.00
16					$0.00				$0.00		0.00	$0.00	#DIV/0!	$0.00
17					$0.00				$0.00		0.00	$0.00	#DIV/0!	$0.00
18					$0.00				$0.00		0.00	$0.00	#DIV/0!	$0.00
19					$0.00				$0.00		0.00	$0.00	#DIV/0!	$0.00
20					$0.00				$0.00		0.00	$0.00	#DIV/0!	$0.00
21					$0.00				$0.00		0.00	$0.00	#DIV/0!	$0.00
22					$0.00				$0.00		0.00	$0.00	#DIV/0!	$0.00
TOTALS		$200.00					$100.00	$100.00		$0.00		$200.00		$0.00

SECTION 0900

STATE REQUIREMENTS

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(**c100ll2**-0112) **VDOT SUPPLEMENTAL SPECIFICATIONS (SSs), SPECIAL PROVISIONS (SPs) AND SPECIAL PROVISION COPIED NOTES (SPCNs)**

Where Virginia Department of Transportation (VDOT) Supplemental Specifications, Special Provisions and Special Provision Copied Notes are used in this contract, the references therein to "the Specifications" shall refer to the *Virginia Department of Transportation Road and Bridge Specifications*, dated 2007 for both imperial and metric unit projects. References to the "Road and Bridge Standard(s)" shall refer to the *Virginia Department of Transportation Road and Bridge Standards*, dated 2008 for both imperial and metric unit projects. References to the "Virginia Work Area Protection Manual" shall refer to the 2011 edition of the *Virginia Work Area Protection Manual* for imperial and metric unit projects. References to the "MUTCD" shall refer to the 2009 edition of the *MUTCD* and the current *Virginia Supplement to the MUTCD* for imperial and metric unit projects. Where the terms "Department", "Engineer" and "Contract Engineer" appear in VDOT Supplemental Specifications, Special Provisions and Special Provision Copied Notes used in this contract and the VDOT publication(s) that each references, the authority identified shall be in accordance with the definitions in Section 101.02 of the *Virginia Department of Transportation Road and Bridge Specifications*, dated 2007. Authority identified otherwise for this particular project will be stated elsewhere in this contract. VDOT Supplemental Specifications, Special Provisions and Special Provision Copied Notes used in this contract and the VDOT publication(s) that each reference are intended to be complementary to the each other. In case of a discrepancy, the order of priority stated in Section 105.12 of the *Virginia Department of Transportation Road and Bridge Specifications*, dated 2007 shall apply. VDOT Special Provision Copied Notes in this contract are designated with "(SPCN)" after the date of each document. VDOT Supplemental Specifications and Special Provision Copied Notes in this contract are designated as such above the title of each document.
The information enclosed in parenthesis "( )" at the left of each VDOT Special Provision Copied Note in this contract is file reference information for VDOT use only. The information in the upper left corner above the title of each VDOT Supplemental Specification and VDOT Special Provision in this contract is file reference information for VDOT use only. The system of measurement to be used in this project is stated elsewhere in this contract. VDOT Supplemental Specifications, Special Provisions and Special Provision Copied Notes containing imperial units of measure with accompanying expressions in metric units shall be referred to hereinafter as "dual unit measurement" documents. Such a "dual unit measurement" is typically expressed first in the imperial unit followed immediately to the right by the metric unit in parenthesis "( )" or brackets "[ ]" where parenthesis is used in the sentence to convey other information. Where a "dual unit measurement" appears in VDOT documents, the unit that applies shall be in accordance with the system of measurement as stated elsewhere in this contract. The unit shown that is not of the declared unit of measurement is not to be considered interchangeable and mathematically convertible to the declared unit and shall not be used as an alternate or conflicting measurement. Where VDOT Specifications are used for metric unit projects and only imperial units of measurement appear the document, the provision(s) in this contract for imperial unit to metric unit conversion shall apply.

105.12 – Coordination of Plans, Standard Drawings, Specifications, Supplemental Specifications, Special Provisions, and Special Provisions Copied Notes has been amended to add the following:

The contract documents Section 0001 through 0900 shall be considered Special Provisions and Section 1000 shall be considered Supplemental Specifications.

12-1-11 (SPCN)

105.19—Submission and Disposition of Claims (City Revision 7-8-16)

(a) **Notice of Intent to File a Claim**
Early or prior knowledge by the City of Harrisonburg of an existing or impending claim for damages could alter the plans, scheduling, or other City of Harrisonburg action or result in mitigation or elimination of the basis for the claim. Therefore, the Contractor shall submit a written statement describing the act of omission or commission by the City of Harrisonburg or its agents that allegedly caused damage to the Contractor and the nature of the claimed damage to the Project Manager at the time of each and every occurrence that the Contractor believes to be the basis

of a claim or prior to the beginning of the work upon which a claim and any subsequent action will be based. "Occurrence" includes, but is not limited to the Project Manager's denial of the Contractor's timely request for time extension, additional compensation, change order, adjustment, or other request under the Contract, or any other decision, instruction, directive, or order that the Contractor believes will result in a claim. The written statement shall clearly state that it is a "notice of intent to file a claim." If such damage is deemed certain in the opinion of the Contractor to result from his acting on an order from the Project Manager, he shall immediately take written exception to the order. Submission of a notice of intent to file a claim as specified shall be mandatory. Failure to submit such notice of intent shall be a conclusive waiver to such claim for damages by the Contractor. An oral notice or statement will not be sufficient nor will a notice or statement after the event. Oral statements recorded in meeting minutes also will not be sufficient.

In addition, at the time of each and every occurrence that the Contractor believes to be the basis of a claim or prior to beginning the work upon which a claim and any subsequent action will be based, the Contractor shall furnish the Project Manager an itemized list of materials, equipment, and labor for which additional compensation will be claimed. The Contractor shall afford the Project Manager every facility for keeping an actual cost record of the work. The Contractor and the Project Manager shall compare records and bring them into agreement at the end of each day. Failure on the part of the Contractor to afford the Project Manager proper facilities for keeping a record of actual costs will constitute a waiver of a claim for such extra compensation except to the extent that it is substantiated by the City of Harrisonburg's records. The filing of such notice of intent by the Contractor and the keeping of cost records by the Project Manager shall in no way establish the validity of a claim.

(b) **Time for Submittal of Claim**
Upon completion or termination of the Contract, the Contractor may, within 60 days after the final estimate date established by the Department pursuant to Code of Virginia § 33.2-1101, deliver to the City of Harrisonburg a certified written claim, which must be a signed original claim document, along with an electronic copy of the claim document as a Portable Document Format (PDF) file, for the amount he deems he is entitled to under the Contract. For the purpose of this Section, the final estimate date shall be that date set forth in a letter from the City of Harrisonburg to the Contractor sent by certified mail and shall be considered as the date of notification of the City of Harrisonburg's final estimate. Regardless of the manner of delivery of the claim, the City of Harrisonburg must receive and have physical possession of the Contractor's written claim within the 60 day period that commences with the final estimate date. Submittals received by the City of Harrisonburg either before the final estimate date or after the 60 day period shall not have standing as a claim.

(c) **Content of Claim**
The Contractor's certified written claim shall set forth in detail the facts upon which the claim is based, including but not limited to the following:

1. A detailed statement of the facts upon which the claim is based providing items of work affected and included in each claim, and the date(s) on which actions or events resulting in the claim occurred or conditions resulting in the claim became evident; and
2. All pertinent data, documents and correspondence that may substitute the claim. The City of Harrisonburg shall have the right, at its expense, to review and copy all of the Contractor's non-privileged project files and documents, both electronic and paper, for use in analyzing the claim; and
3. Identification of the provisions of the Contract that the City of Harrisonburg's allegedly breached, and the acts or omissions constituting such breach.
4. A detailed statement of the amount of the actual cost for materials, labor and equipment sought in the claim.
5. A copy of the notice(s) of intent to file a claim that the Contractor submitted to the City of Harrisonburg for the claim(s).

(d) **Certification of Claim.**
The Contractor shall submit with the claim a written certification of the claim in the following form:

Pursuant to the Code of Virginia, I hereby certify that this Contract claim submission for Virginia Department of Transportation Project No. _____ in _____ County, Virginia, is a true and accurate representation of additional costs, expenses, damages and/or delays incurred by _____ (Contractor) or its subcontractors or suppliers in the performance of the required Contract work. Any statements, representations, writings, or

documents, made or used and known to be false, shall be considered a violation of the Virginia Governmental Frauds Act, punishable as allowed by the Code of Virginia for a Class 6 Felony, and shall be considered a violation of the Virginia Fraud Against Taxpayers Act, subject to the civil penalties allowed by the Code of Virginia.

_____(Contractor)
By:_____
As officer or duly appointed agent of _____(Contractor)
Title: _____
Date: _____
State Of: _____
City/County of _____, To-Wit:
I, the undersigned, a Notary Public in and for the City/County and State aforesaid, do hereby certify that _____ , whose name is signed to the foregoing instrument, bearing date of the_____ day of_____, 20__, has this day acknowledged the same before me in my City/County and State aforesaid.
Given under my hand this _____ day of _____ , 20___.
Notary Public: _____
Notary Registration No.: _____
My commission expires: _____

Claims submitted by the Contractor for itself or its subcontractors or suppliers during the statutory period for submitting Contract claims that are submitted without the Contractor's certification described above shall not have standing as a claim and shall not be considered by the City of Harrisonburg.

(e) **Review of Claim**
Within 90 days from the receipt of the claim, the City of Harrisonburg will make an investigation and notify the Contractor by certified mail of its decision. However, by mutual agreement, the City of Harrisonburg and Contractor may extend the 90-day period for another 30 days. If the Contractor is dissatisfied with the City of Harrisonburg's decision, within 30 days from receipt of the decision the Contractor shall notify the City Manager in writing that it desires to appear before the City Manager, whether in person or through counsel, and present additional facts and arguments in support of its claim. The City Manager will schedule and meet with the Contractor within 30 days after receiving the request. However, the City Manager and Contractor, by mutual agreement, may schedule the meeting to be held after 30 days but before the 60th day from the receipt of the Contractor's written request. Within 45 days from the date of the meeting, the City Manager will investigate the claim, including the additional facts presented, and notify the Contractor in writing of his decision. However, the City Manager and Contractor, by mutual agreement, may extend the 45-day period for another 30 days. If the City Manager deems that all or any portion of a claim is valid, he shall have the authority to negotiate a settlement with the Contractor subject to any approvals required by the Code of Virginia. Any monies that become payable as the result of claim settlement after payment of the final estimate will not be subject to payment of interest unless such payment is specified as a condition of the claim settlement.

(f) **Compensation for Claims**
The Project Manager will determine time extension according to 108.04 and compensation according to 109.05 if the Department concludes that the Contractor has established entitlement to compensation or a time extension for the claim.

END STATE REQUIREMENTS

1000 – Quality Control, Quality Assurance & Independent Assurance Testing

The contractor shall be responsible for the quality of construction and materials incorporated into the Project. The Contractor's Quality Control/Acceptance Testing measures shall ensure that operational techniques and activities provide material of acceptable quality. Contractor sampling and testing shall be performed to control the processes and determine the degree of materials compliance with the Contract.

CONSTRUCTION QUALITY CONTROL/ACCEPTANCE TESTING PLAN

The Contractor shall submit for review and approval a Construction Quality Control (QC) Plan and it must address the following:

1. Describe the Contractor's Quality Control organization, including the number of full-time equivalent employees or Sub-Contractors with specific Quality Control responsibilities, including an organizational chart showing lines of authority and reporting responsibilities.
2. List by discipline the name, qualifications, duties, responsibilities and authorities for all persons proposed to be responsible for Construction Quality Control.
3. Provide Quality Control sampling, testing and analysis plan with methods that include a description of how random locations for testing and sampling are determined.
4. Identify the laboratory(s) to be used for each type of testing.
5. Specify documentation for QC activities.
6. Provide procedures to meet contract requirements for corrective action when QC criteria are not met.

The Contractor's QC Plan shall utilize industry standard inspection procedures as well as those outlined in VDOT's Construction Manual, Materials Manual of Instruction, Road and Bridge Specifications and the minimum requirements outlined in the following tables. All materials utilized on the project shall be from VDOT approved sources and all mix designs shall be VDOT approved.

CONTRACTOR RESPONSIBILITIES

The Contractor shall prepare test reports meeting the requirements of AASHTO R18 or may use the current appropriate VDOT forms. The Contractor shall also prepare, maintain and submit completed test records and final materials certification in accordance with the requirements of VDOT's Construction Manuel, Materials Manual of Instruction and this Section.

Contractor shall furnish copies of all test results to the Project Manager or other authorized City representative within 24 hours of completing the test of the acquired sample or the next day of business.

ACCEPTANCE

All plant manufactured materials shall be tested at the plant and accepted by VDOT in accordance with VDOT's QA/QC Programs as described in the Materials Manual of Instruction. Field testing for density shall be the responsibility of the Contractor for QC.

A cooperative effort by the Contractor and the City to identify the cause of any non-specification material or any discrepancy in the test results will include the following actions:

- A check of test data, calculation and results;
- Observation of the Contractor's sampling and testing by the City;
- Check of test equipment by the City.

When the source of test result discrepancies between the Contractor and the City/VDOT cannot be resolved, a referee split sample shall be obtained and tested; this work shall be performed by the City/VDOT. The testing of the sample shall be performed in duplicate by the laboratory without knowledge of the specific project conditions such as the identity of the Contractor, the test results of the City/VDOT and Contractor of the specification targets. The results of these tests shall be binding on both the Contractor and the City. The Contractor or its representative may witness the testing if requested.
Costs incurred for referee testing shall be paid by the party found in error.

SMALL QUANTITIES

The City may elect to accept small quantities of material without normal sampling and testing frequencies. The determination to accept materials using this provision rests solely with the City. Structural Concrete shall not be considered under the small quantity definition.

Factors that the City shall consider prior to use of small quantity acceptance are:

- Has the material been previously approved?
- Is the material certified?
- Is there a current mix design or reference design?
- Has it been recently tested with safisfactory results?
- Is the material structurally significant?

Small quantity acceptance may be accomplished by visual, certification or other methods. Acceptance of small quantities of materials by these methods must be fully documented. Documentation of materials under these methods must be provided by the City. For visual documentation, an entry shall be noted on field records, with a statement as to the basis of acceptance of the material and the approximate quantity involved.

PAYMENT

The costs of all material, labor, personnel, equipment, sampling, testing, documentation and report preparation for QC sampling and testing of material under the above Construction Quality Control Plan shall be incidental to the contract bid price of the respective material. No additional compensation shall be provided for these items.

QUALITY ASSURANCE/VERIFICATION SAMPLE TESTING

Quality Assurance (QA)/Verification Sampling Testing (VST) will be the responsibility of the City of Harrisonburg and shall be performed in accordance with the following tables.

SECTION 1000

SUPPLEMENTAL SPECIFICATIONS

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Appendix 13.2 – E

Independent Assurance Tolerances

Test	IA Comparison Tolerance	Source
Soil/ Aggregate Wet Density using Nuclear gauge in Direct Transmission	CL Soil – 1.91 pcf ML Soil – 2.15 pcf SP Soil – 1.86 pcf	AASHTO T-310 / VTM 10
Soil/Aggregate Density using Sand Cone	2.0 pcf	ASTM D1556 / AASHTO T-217
Soil/Aggregate Moisture using Nuclear gauge (backscatter)	CL Soil – 1.44 pcf ML Soil – 1.63 pcf SP Soil – 2.10 pcf	AASHTO T-310 / VTM 10
Soil/Aggregate Moisture determined by oven dry	14% difference*	ASTM D2216 / AASHTO T-265
One Point Proctor - density	4.5 pcf	AASHTO T-99 Method A
One Point Proctor - moisture	15% difference*	AASHTO T-99 Method A
Concrete Slump	0.82 inch for 1” to 2” slump 1.10 inch for 3” to 4” slump 1.50 inch for 5” to 6” slump	ASTM C143
Concrete Air-	0.8% points using pressure meter 32% difference using roller meter	ASTM C 231 ASTM C 173
Concrete Temperature	1 degree F	ASTM C 1064
Concrete Unit Weight	2.31 pcf	ASTM C 138
Concrete Permeability	51% difference*	VTM 112
Concrete Strength	8% difference on the average of 3 cylinders	ASTM C39 ASTM C31
Asphalt Bulk Specific Gravity	0.02	AASHTO T-166 / VTM 6
* Percent difference calculation shall be % diff ≤ ({absolute value[W1-W2]} / ((1/2) * (W1+W2)))*100		

*These IA tolerances are meant to be used when comparing split samples tested independently by QC tester with their test equipment and IA tester with his/her test equipment. These tolerances are based on the D2S rating between laboratories. Example: the QC test for slump on concrete sample taken out of a wheel barrow is 5 ¼ “. The IA test on that same sample (out of the same wheel barrow should be within 3 ¾” to 6 ¾” to be considered confirming the test equipment and procedures between the two tester is the same.

Appendix 13.2– G

Materials Testing Methods and Frequencies

Locally Administered Projects using:

1. Design-Bid-Build model where the locality is providing:
    a. The inspection and testing staff
    b. Requesting VDOT to provide inspection and testing
    c. Hiring an Engineering consultant firm for inspection and testing*

        *The consultant must be independent from the contractor performing the construction work.

Shall use the Acceptance/VST/IA Frequency tables included in this appendix for acceptance and Independent Assurance (IA) testing. If a testing method or frequencies is not cited, the Materials Manual of Instruction test method and frequencies shall be used. Some Quality Assurance programs depend on project samples to be tested for verification. These are denoted as verification samples and tests (VST) in the tables.

Locally Administered Projects using:

1. Design-Build model
2. Public-Private Partnership delivery model
3. Contractor performs testing (QC testing)

Shall use the Tables of Minimum Requirements for Quality Assurance and Quality Control on Design-Build and P3 Projects published in the latest Minimum Requirements for Quality Assurance and Quality Control on Design Build and Public-Private Transportation Act Projects.

Acceptance/VST/IA Frequency - Soil & Aggregate

Material Type	Spec Section	Test Reference	Acceptance Testing	VST	IA
Backfill	Contract Special Provisions				
Moisture Density Relations-Standard Proctor, Atterberg Limits & Grain Size Analysis (All Backfill Types)		VTM-1, VTM-7, & VTM-25	Done during project development	NA	Non required if performed in VDOT or AMRL accredited laboratory
One Point Proctor Check Compare to Nuclear Gauge		VTM 012	As needed.	NA	Run split sample when needed. 1 test per project to check procedure and equipment.
In Place Density Tests:					
Box Culverts, Pipes & other Drainage Structures	302,303	VTM-10	A minimum of one (1) test shall be performed per lift on alternating sides of the structure for each 300 linear ft. or portion thereof in structure length. This test pattern shall begin after the first 4-in. compacted layer above the structure's bedding and shall continue to one (1) foot above the top of the structure.	NA	One IA shall be conducted on each compaction technician once per project regardless of the structure or material type (box culvert, pipe, Abutment, retaining wall or embankment). IA shall consist of a split density test in situ, observing technician technique, checking equipment calibrations and calculations.

Material Type	*Spec Section*	*Test Ref.*	*Acceptance Testing*	*VST*	*IA*
BACKFILL					
Abutments, Retaining Walls and MSE Walls	Sections 303,401	VTM-10	A minimum of two (2) tests every other lift up to 100 linear ft. shall be performed. Testing shall be performed behind these structures at a distance from the heel no farther than a length equal to the height of the structure plus 10 ft. For MSE Walls, Less than 100 linear ft. a minimum of one (1) test every other lift shall be performed. The testing shall be performed a minimum distance of 8 ft. away from the face of the wall, to within three feet of the back edge of the zone of the reinforced fill area. Test sites shall be staggered throughout the length of the wall to obtain uniform coverage. Testing shall begin after the first two (2) lifts of reinforced fill have been placed and compacted. Walls more than 100 linear ft., a minimum of two (2) tests every other lift not to exceed 200 linear ft. shall be performed.	NA	One IA shall be conducted on each compaction technician once per project regardless of the structure or material type (box culvert, pipe, Abutment, retaining wall or embankment). IA shall consist of a split density test in situ, observing technician technique, checking equipment calibrations and calculations.
SOILS/ EMBANKMENT					

Material Type	*Spec Sect*	*Test Ref.*	*Acceptance Testing*	*VST*	*IA*
SOILS/EMBANKMENT					
Moisture Density Relations-Standard Proctor, Atterberg Limits & Grain Size Analysis (Soils/Embankment)		VTM-1, VTM-7, & VTM-25	Done during project development	NA	1 test per year during production; minimally perform one (1) in first five (5) tests taken for QA
One Point Proctor Check Compare to Nuclear Gauge (Soils/Embankment)		VTM 012	As needed.	NA	1 test per year during production; minimally perform one (1) in first five (5) tests taken for QA
Embankment in Place Density (Soils/Embankment)	Sect. 303	VTM-10	The minimum number of field density tests required shall be one for each 2500 yd^3 or less of fill material placed, with the following additional requirements: (a) For fill areas less than 500 ft. in length, a minimum of one (1) field density test for every other 6-in. compacted layer from the bottom to the top of fill starting with the second lift. (b) For fills 500 to 2000 ft. in length, a minimum of two (2) field density tests for each 6-in. compacted layer within the top five (5) ft. of fill. (c) For fills greater than 2000 ft. in length, break into equal sections not to exceed 2000 ft. and test each section in accordance with (b) above.	NA	One IA shall be conducted on each compaction technician once per project regardless of the structure or material type (box culvert, pipe, Abutment, retaining wall or embankment). IA shall consist of a split density test in situ, observing technician technique, checking equipment calibrations and calculations
Subgrade	Sec. 305	VTM-10	In the finished subgrade in both cut and fill sections, a minimum of one (1) test represented by the average of five nuclear density	NA	One IA shall be conducted on each compaction technician once per project regardless of the structure or material type (box culvert, pipe, Abutment,

Material Type	*Spec Sect*	*Test Ref.*	*Acceptance Testing*	*VST*	*IA*
subgrade cont.			readings shall be performed for each 2000 linear ft. of subgrade for each roadway (full width).		retaining wall or embankment). IA shall consist of a split density test in situ, observing technician technique, checking equipment calibrations and calculations
Aggregate Base and Subbase Material	VDOT Sections 306, 307, & 309				
Depth Checks		VTM-38	For Method VTM-38A, one (1) depth test shall be conducted for each one-half (1/2) mile of stabilization per paver (mixer) application width. In other words, each separately applied width of stabilization, regardless of roadway width, shall require a series of tests. For method VTM-38B, the project shall be divided into lots, with each lot stratified, and the location of each test within the stratified section determined randomly. A lot of material is defined as the quantity being tested for	NA	Minimum of one per project, unless quantity of individual material(Base, sub-base, etc.) is less than 500 tons per project, in which case no IA test required for that material

Material Type	*Spec Sect*	*Test Ref.*	*Acceptance Testing*	*VST*	*IA*
AGGREGATE BASE/ SUBBASE Depth Checks Cont.			acceptance, except the maximum lot size shall be two (2) miles for each paver application width. The randomization procedure used shall be at the direction of the Engineer. (See VTM-38 for example.) Samples shall be taken from the lot at the following rate: Lot Size No. of Samples Required 0 - 1 Mile 2 1 - 1 1/2 Miles 3 1 1/2 - 2 Miles 4		
In Place Density		VTM-10	When the subgrade, consisting of material-in-place or imported material other than aggregate base, subbase, or select material, is stabilized with cement or lime, one density test (average of 5 readings) shall be conducted for each one-half (1/2) mile of stabilization per paver (mixer) application width. In other words, each separately applied width of stabilization, regardless of roadway width, shall require a separate series of tests.	NA	One test per project, consisting of the average of 5 readings. Minimum of 5 readings per project, unless total quantity of individual material(Base, sub-base, etc.) is less than 500 tons per project, in which case no IA test

Material Type	*Spec Sect*	*Test Ref.*	*Acceptance Testing*	*VST*	*IA*
Treated Subgrade/Subbase, Aggregate Base Material, and Cement Treated Aggregate Base Material	VDOT Sections 306, 307, & 309				
Depth Checks		VTM-38	For Method VTM-38A, one (1) depth test shall be conducted for each one-half (1/2) mile of stabilization per paver (mixer) application width. In other words, each separately applied width of stabilization, regardless of roadway width, shall require a series of tests. For method VTM-38B, the project shall be divided into lots, with each lot stratified, and the location of each test within the stratified section determined randomly. A lot of material is defined as the quantity being tested for acceptance, except the maximum lot size shall be two (2) miles for each paver application width. The randomization procedure used shall be at the direction of the Engineer.	NA	Minimum of one per project, unless quantity of individual material(Base, sub-base, etc.) is less than 500 tons per project, in which case no IA test required for that material

Material Type	*Spec Sect*	*Test Ref.*	*Acceptance Testing*	*VST*	*IA*
TREATED SUBGRADE/ SUBBASE, AGGREGATE BASE & CEMENT TREATED AGGREGATE BASE MATERIAL Depth Checks Cont.			(See VTM-38 for example.) Samples shall be taken from the lot at the following rate: Lot Size No. of Samples Required 0 - 1 Mile 2 1 - 1 1/2 Miles 3 1 1/2 - 2 Miles 4		
In Place Density		VTM-10	When the subgrade, consisting of material-in-place or imported material other than aggregate base, subbase, or select material, is stabilized with cement or lime, one density test (average of 5 readings) shall be conducted for each one-half (1/2) mile of stabilization per paver (mixer) application width. In other words, each separately applied width of stabilization, regardless of roadway width, shall require a separate series of tests.	NA	One test per project, consisting of the average of 5 readings. Minimum of 5 readings per project, unless total quantity of individual material(Base, sub-base, etc.) is less than 500 tons per project, in which case no IA test
Clearing and Grubbing	VDOT Section 301				
Ensure activities are confined to limits and seeded within 30 days of disturbance		N/A	Daily		Weekly

Material Type	*Spec Sect*	*Test Ref.*	*Acceptance Testing*	*VST*	*IA*
Erosion and Siltation Control	VDOT Section 303.03 & Current Virginia DCR Specifications				
Monitor for correct installation and Maintenance		N/A	Daily		After rain event
Undercut	VDOT Section 303.04				
Review area to determine need for undercut		N/A	Prior to start of work at each location	All reports reviewed by Locality Project Manager to verify qualified inspector and correct equipment	One (1) report reviewed per month during production to verify qualified inspector and qualified personnel
Measure undercut area		N/A	Prior to backfill at each location	All calculations/reports checked/reviewed by Locality Project Manager to verify qualified inspector and correct equipment	One (1) calculation/report checked/reviewed to verify qualified inspector and correct equipment
Overlay Sands					
Grade D Silica Sand	Special Provision		One bag per project tested in AMRL lab.	NA	NA

Acceptance/VST/IA Frequency - Hydraulic Cement Concrete

Material Type	Spec Section	Test Reference	Acceptance Testing	VST	IA
Cast-In-Place Structures and Bridge Concrete	VDOT Section 217				
Concrete Entrained Air Content (CIP Concrete)	217.08	ASTM C231 or C173	Test every load, except for bridge decks, in which case one test per truck-load for the first 3 trucks and then one test for every third truckload thereafter, provided results remain within 1.0% of median of design range. Test also required when making compressive specimens	NA	One test shall be made on the same batches of concrete from which cylinders are taken
Slump of Hydraulic Cement Concrete (CIP Concrete)	217.08	ASTM 143	Test every load and when making compressive specimens	NA	One test shall be made on the same batches of concrete from which cylinders are taken
Temperature of Concrete (CIP Concrete)	217.10	ASTM C1064	Test every load and when making compressive specimens	NA	One test shall be made on the same batches of concrete from which cylinders are taken

Material Type	*Spec Sect*	*Test Ref.*	*Acceptance Testing*	*VST*	*IA*
CAST-IN-PLACE STRUCTURE & BRIDGE CONCRETE					
Compressive Strength of Concrete Cylinders (CIP Concrete)	217.08	ASTM C31 & C39	One set of three cylinders per every 100 CY and at least two sets of cylinders per structure per class of concrete.	NA	Minimum of one set per 1000 cubic yards of structural concrete. Not required for projects having less than 300 cubic yards. Cylinders should be from the same load as acceptance samples.
Chloride Permeability Concrete Cylinders (CIP Concrete)	Check Plan sheets	VTM-112	One set of two cylinders per every 100 CY and at least two sets of cylinders per structure per class of concrete.	NA	Non required if performed in VDOT or AMRL accredited laboratory
Concrete Reinforcing Steel (CIP Concrete) elongation, yield strength and ultimate strength	223	ASTM A615	Accepted based on certification provided by the fabricator. Verify manufacturer's certificates for every shipment for acceptance prior to placement.	One sample per project per manufacturer per most common size bar.	Non required if performed in VDOT or AMRL accredited laboratory
Pavement	VDOT Section 217				
Concrete Entrained Air Content (Pavement)	217.08	ASTM C231 or C173	One test per hour & when casting flexural specimens	NA	One test per four roadway miles or fraction thereof, with a minimum of one per project

Material Type	*Spec Sect*	*Test Ref.*	*Acceptance Testing*	*VST*	*IA*
PAVEMENT					
Slump of Hydraulic Cement Concrete (Pavement)	217.08	ASTM 143	Two tests daily & when making flexural specimens	NA	One test shall be made on the same batches of concrete from which cylinders taken
Temperature of Concrete (Pavement)	217.10	ASTM C1064	One test per hour & when casting flexural specimens	NA	One test shall be made on the same batches of concrete from which cylinders taken.
Compressive Strength of Concrete Cylinders (Pavement)	217.08	ASTM C31 & C39	If pavement is accepted based on cylinder strength. One (1) set of three (3) cylinders cast for every 100 cy and at least one for each days concreting operation	NA	Minimum one set per 1000 cubic yards of structural concrete, except that IA will not be required for projects having less than 300 cubic yards.
Flexural Strength Beams	316.04	ASTM C293	If pavement is to be used as haul road or prior to 14 days then, At least one beam cast for each days concreting operation.	NA	NA
Concrete Reinforcing Steel (pavement) elongation, yield strength and ultimate strength	223	ASTM A615	Accepted based on certification provided by the fabricator. Verify manufacturer's certificates for every shipment for acceptance prior to placement.	One sample of two pieces 24 inches long from the most prevalent bar size per structure, with no two samples being the same size	Non required if performed in VDOT or AMRL accredited laboratory
Miscellaneous Concrete	VDOT Section 217				
Concrete Entrained Air Content (Miscellaneous Concrete)	217.08	ASTM C231 & C173	One test per day and when making compressive specimens	NA	NA

Material Type	*Spec Sect*	*Test Ref.*	*Acceptance Testing*	*VST*	*IA*
MISC CONCRETE					
Slump of Hydraulic Cement Concrete (Miscellaneous Concrete)	217.08	ASTM C143	One test per day and when making compressive specimens	NA	NA
Temperature of Concrete (Miscellaneous Concrete)	217.10	ASTM C1064	One test per day and when making compressive specimens	NA	NA
Compressive Strength of Concrete Cylinders (Miscellaneous Concrete)	217.08	ASTM C31 & C 39	One (1) set of three (3) cylinders per every 250 CY and at least one set per day	NA	One (1) set of three (3) cylinders per every 25,000 CY (cumulative) minimum 1 per project.
Concrete Reinforcing Steel (Miscellaneous Concrete)	223	ASTM A615	Accepted based on certification provided by the fabricator. Verify manufacturer's certificates for every shipment for acceptance prior to placement.	One sample of two pieces 24 inches long from the most prevalent bar size per structure, with no two samples being the same size	Non required if performed in VDOT or AMRL accredited laboratory
Concrete Curing Materials	VDOT Section 220				
Burlap		AASHTO M182, class 3	Verification of LM # and lot numbers if from QA supplier Approved list 44, if not test one sample per lot number	NA	Non required if performed in VDOT or AMRL accredited laboratory
White liquid membrane Curing Compound		VTM - 2	Verification of LM # and batch numbers if from QA supplier Approved list 44, if not test one sample per batch number	NA	Non required if performed in VDOT or AMRL accredited laboratory
Fugitive Dye Liquid Membrane Curing Compound		VTM - 2	Verification of LM # and batch numbers if from QA supplier Approved list 44, if not test one sample per batch number	NA	Non required if performed in VDOT or AMRL accredited laboratory

Material Type	*Spec Sect*	*Test Ref.*	*Acceptance Testing*	*VST*	*IA*
CONCRETE CURING MATERIALS					
Polyethylene Film		AASHTO M171	Verification of LM # and lot numbers if from QA supplier Approved list 44, if not test one sample per lot number	NA	Non required if performed in VDOT or AMRL accredited laboratory

QC/VST/IA Frequency - Asphalt

Material Type	Spec Section	Test Reference	Contractor QC Testing	VST	IA
Asphalt Concrete Pavement	VDOT Section 315				
Pavement Density by Nuclear Method with In Place Pavement Density (Asphalt Pavement)		VTM-76, VTM-6	Establish Roller pattern, control strips and test sections, 10 stratified random density test sites per test section (5,000 ft.)	VST is performed on Twenty (20) percent of QC lots. Obtain two cores in one randomly selected QC lot out of five lots to verify in place density. Minimum one VST sample per project.	IA=10%*QC Readings Locality representative observe and witness QC testing to assure gauge is calibrated and accurate. Observe and verify test sites are random and match selected sites. Verify that QC tests are done using proper procedures. Observe one control strip per density technician and obtain all cores from control strip for reweighing in laboratory (randomly select a minimum 10% of cores) to confirm field density testing.

Material Type	*Spec Sect*	*Test Ref.*	*Contractor QC Test*	*VST*	*IA*
ASPHALT CONCRETE PAVEMENT In Place Pavement Density (for all asphalt except Stone Matrix Asphalt (SMA))		VTM-006; VTM-32	**Density** - min. 1 core per location not long enough to establish roller pattern/control strip	**Density -** One (1) random core per 10 QC locations. Independent of contractor cores.	Obtain cores taken for density. Reweigh at least 10% of these cores in laboratory to confirm density. Observe one (1) density determination per ten (10) locations performed by QC technician. Minimum 1 per project.
Depth Checks		VTM-32	Depth checks of surface and intermediate material required only if specific plan depths are called for, not when plans specify rate of application. One (1) per 1/2 mile per lane width, minimum one (1) test per roadway, maximum lot size 2 mile (4 tests)	NA	Select one (1) QC core per five (5) lots and remeasure thickness. A minimum of one (1) per project.
In Place Pavement Density and Depth Checks by cores for Stone Matrix Asphalt (SMA)		VTM-006	Establish trial section and test sections. Minimum of one (1) sample per 1,000 feet with a maximum of 5 samples per day/night's production for density and depth for test sections. Three (3) cores for test strip.	Two (2) stratified random cores per one day/ night production obtained independently of contractor. Minimum two (2) per project.	Locality Representative Independently weigh and measure a minimum of one (1) QC core per day/night's production Locality representative will observe the taking of these cores and will maintain control of these cores once obtained
Permanent Pavement Marking	VDOT Section 512		**Contractor QC Testing**	**VST**	**IA**

Material Type	*Spec Sect*	*Test Ref.*	*Contractor QC Test*	*VST*	*IA*
PERMANENT PAVEMENT MARKING Permanent Pavement Marking - Preformed Tape		VTM-94	Daily perform VTM 94 at start up with periodic checks every three hours of operation	Randomly select three (3) ten foot in place sections of markings per day and measure thickness and width. Skip lines and edge lines are considered separately. Inspect PM for correct placement, straightness and edges. Observe the bead embedment, color (night and day) and brightness/reflectivity Inspect structure of tape to ensure patterned waffles have not been damaged by roller	Review all C-85 reports during production to verify that plan quantities match application quantities and that daily measurements are performed according to VTM 94.
Permanent Pavement Marking - Liquid Materials (Paint, thermoplastic and epoxy)		VTM-94	Daily perform VTM 94 at start up with periodic checks every three hours of operation	Randomly select three (3) ten-foot in place sections of markings per day and measure thickness and width. Skip lines and edge lines are considered separately. Inspect PM for correct placement, straightness and edges. Observe the bead embedment, color (night and day) and brightness/reflectivity. Review application rates to ensure proper thickness has been applied	Review start up calibrations. Ensure one plate sample is taken and tested for thickness, width, bead distribution and embedment. Retain sample for further testing if needed. Review all C-85 reports during production to verify that calculated quantities match application rates and that daily measurements are performed according to VTM 94.

QC/VST/IA Frequency - Misc Roadway and Structure

Material Type	Spec Section	Test Reference	QC Testing	VST	IA
Pre-cast Structures	VDOT Section 404				
Verify bedding material is installed properly and that pre-cast materials are not chipped or cracked		N/A	Daily and when shipment arrives on project	Inspect Precast structure before backfilling operations begin.	Inspect Pre-cast structures when received on job site. Inspect bedding before setting structure.
Load Bearing Piles	VDOT Section 403				
Monitor operation and document blow counts		N/A	Continuously	Review documentation weekly.	Daily
Perform Center of Gravity Calculations		N/A	For each Foundation	one out of every twenty (20) foundations	one out of every ten (10) foundations
Structural Steel	VDOT Section 407				
Receive Bolts, sample, verify the documentation is complete and perform laboratory Skidmore, tension and galvanized coating testing	VDOT 226.02(h)		Each nut-bolt-washer (NBW) assembly lot shall be sampled at a minimum rate of 2 assemblies per NBW lot. The documentation	Ea. NBW assembly lot shall be tested, one bolt in direct tension, one assembly for galvanized coating and one nut and bolt for rotational capacity testing (Rot-	The documentation shall be reviewed to insure all parts are present and that the required tests have been performed by the producers and that the markings match the

Material Type	*Spec Sect*	*Test Ref.*	*QC Testing*	*VST*	*IA*
STRUCTURAL STEEL cont. Receive bolts, sample, verify the documentation is complete & perform lab Skidmore, tension & galvanized coating testing			shall be collected from the bolt supplier and the galvanizer for each lot and supplied along with the samples to the QAM. QC personnel shall monitor the storage and conditions of the bolts to insure they remain in good well lubricated condition.	Cap) as per section 226	suppliers. The results of the VST shall be reviewed to insure the material passed the tests.
Verify daily Skidmore testing is performed IAW (in accordance with) proper procedures for each lot Note: NBW assembly may be reused after Skidmore testing in a connection if no defects are noted in visual inspection and the nut runs freely up the bolt for the full thread length - Only new NBW assemblies may be tested each day	VDOT 407.06(c)		Ea. Day & Ea. NBW lot (3 bolts per lot) used shall be Rot-Cap tested in the Skidmore device IAW proper procedures	Minimum three (3) NBW assemblies for each lot being installed shall be observed by the IA inspector	Three NBW assemblies from each lot shall be Rot-Cap tested at the QAMs lab independently each week during erection
Verify the installation crews are using proper installation procedures IAW specs. to tension the bolts	VDOT 407.06		Monitor ea. Crew (2-3 workers) during erection to insure proper technique (TOTN – turn-of-the-nut or DTI – direct tension indicating washers) is followed	NA	Monitor ea. Crew (2-3 workers) for a half dozen NBW assemblies once at the beginning of each four hour work period
Verify the bolted connections have been tensioned properly using statistical sampling frequency and a calibrated torque wrench	VDOT 407.06(c)4	ASTM 325	For each connection, test 10% or a minimum of 2 NBW assemblies verifying the required torque. Complete testing before the deck is formed.	Test 2 NBW assemblies in 25% of the slip critical connections (minimum of 2 connections per transverse line of splices) and 2 NBW assemblies in 10% of the secondary member connections	Monitor all the torque testing for each main member connection (slip-critical connections) and at the beginning of each period where secondary members are being checked.

Material Type	*Spec Sect*	*Test Ref.*	*QC Testing*	*VST*	*IA*
STRUCTURAL STEEL					
Rebar Splicer (Tension Test)		ASTM A615	1 sample per manufacturer per most common size per structure (Contractor is to install pieces)	NA	Verify Machine Calibration annually
Protective Coating of Metal Structures	VDOT Section 411		**Contractor QC testing**	**VST**	**IA**
Monitor surface preparation		SSPC-PA	Three surface profile measurements per day of blasting.	Review all reports showing the preparation protocols	Two (2) surface profile measurements per week of blasting.
check coating thickness according to SSPC -PA		SSPC-PA	Five(5) spot measurements (15 Readings) per day as defined in PA-2 for coating thickness after each layer of paint at each location	Review all reports showing-painting application rates including the tests performed on profiles and thicknesses.	One spot measurement (3 readings) as defined in PA-2 for coating thickness after each layer of paint at each location
Underdrains	VDOT Section 501				
Inspect to ensure no deficiencies		VTM 108	All accessible outlet locations; Additionally a minimum of 10% of longitudinal sections	One (1) every twenty-five (25) outlet locations. A minimum of one per project independent of IA.	Observe 10% of outlet locations; Additionally a minimum of 1% of longitudinal sections
Guardrail	VDOT Section 505				
Verify that guardrail is installed per specifications and at proper height			Daily	Spot-check every 500 linear feet for proper height	Spot-check every 50 linera feet for proper height.

Material Type	*Spec Sect*	*Test Ref.*	*QC Testing*	*VST*	*IA*
Fencing	VDOT Section 507				
Verify fencing type, height and location		N/A	Daily	Weekly	
Barbed Wire	VDOT Section 242	ASTM A121	One sample every 50 rolls or spools	NA	NA
Chainlink Fence	VDOT Section 242	AASHTO M181	One sample from 3 rolls for every 50 rolls.	NA	NA
ROW Monuments	VDOT Section 503				
Verify monument type and location		N/A	10% of ROW monuments	1% of ROW monuments	
Maintenance of Traffic	VDOT Section 512				
Monitor installation and maintenance and use Work Zone Safety Checklist		N/A	Daily (Locality Inspector)	Weekly (Locality Project Manager)	
Sound Wall Barriers	VDOT Section 519				
Verify location and installation with shop drawings		N/A	Daily	Weekly	
Topsoil and Seeding	VDOT Section 602/603				

Material Type	*Spec Sect*	*Test Ref.*	*QC Testing*	*VST*	*IA*
TOPSOIL & SEEDING					
Verify proper material is utilized at application rates from plans		N/A	Daily	Weekly	
Traffic Signs	VDOT Section 512				
Verify that signs meeting current standards are utilized in locations per plans		N/A	Daily	Weekly	
Traffic Signals	VDOT Section 703				
Monitor installation for conformance with plans and specifications		N/A	Daily	Weekly	
Water and Sewer Facilities	VDOT Section 520				
Monitor installation for conformance with plans and specifications		N/A	Daily	Weekly	
Electrical and Signal Components	VDOT Section 238				
Tether Wire		ASTM A475	One sample per project	NA	NA
Span Wire		ASTM A475	One sample per project	NA	NA
Masonry	VDOT Section 202				
Wall Units			one sample consisting of 10 units per 10,000 units	NA	NA

- Verification testing shall be required if contractor's workforce performs QC testing that is used for Acceptance testing. If Locality or its consultant performs Acceptance testing, Verification testing shall not be required.
- IA testing shall be conducted by different personnel and different equipment than used for the QC/acceptance testing, QC/acceptance sampling or Verification testing.

1002 – James Madison University Campus Construction Guidelines

Parking

Parking in unauthorized spaces is prohibited. Parking to unload construction material must be approved by project manager. Under no circumstances is parking in fire lanes or handicap spaces allowed. Contractor has the responsibility to obtain parking passes from Parking Services Department, located at the parking deck, at Newman Lake.

Utilities Locating

Contractor shall call JMU Utility Locator, Jack Martin at (540) 820-5225, one week prior to beginning of work for an excavation permit. Contractor is responsible for contacting "Miss Utility".

Both locally owned and university owned utilities exist on the JMU campus. The contractor shall obtain the JMU-issued excavation permit prior to the start of any excavation work. Excavation permit application forms shall be obtained from the JMU Facilities Engineering and Construction Department. Separate provisions shall always be made to contact Miss Utility for any ground penetrating project. The following applies to coordination with the JMU Utility Locating Department (ULD):

10.1.1 The permit is only valid for the specified project on JMU property.

10.1.2 Contractor shall contact the JMU ULD a minimum of 5 working days prior to all excavations.

10.1.3 Excavation permit shall only be issued after the JMU ULD marks all utility lines.

10.1.4 The excavation permit is only valid for 15 calendar days from the date issuance.

10.1.5 Once the JMU ULD has established the utility line markings, it is the responsibility of the contractor to continue to call the JMU ULD every ten (10) days thereafter to remark the lines until the area is fully excavated. An updated permit shall be issued upon each line remarking.

10.1.6 The damage to any encountered utilities shall be cause for immediate contact of the JMU Utilities Location Department and a stop-work on all excavations.

10.1.7 The contractor shall be fully responsible for any and all resulting damages within the JMU ULD marked lines for the entire excavation process.

SECTION 007355 - VSMP GENERAL PERMIT FOR CONSTRUCTION ACTIVITIES

PART 1 - GENERAL

1.1 DESCRIPTION

A. This Section specifies requirements for the individuals that are in control of the site to implement a Storm Water Pollution Prevention Plan (SWPPP). This SWPPP shall be prepared by the Contractor as part of the filings for a Virginia Stormwater Management Program (VSMP) Permit as administered by the Virginia Department of Environmental Quality (DEQ) through the National Pollution Discharge Elimination System (NPDES) General Permit for Construction Activities.

B. The storm water pollution prevention measures contained on the site drawings are the minimum required by the Virginia Department of Environmental Quality. The Contractor is required to provide additional measures to prevent pollution from storm water discharges in compliance with the VSMP regulations and all other local, state, and federal requirements.

C. VSMP Permit requirements:

1. Operations of construction activities resulting in land disturbance equal to or greater than one acre must apply for Construction General Permit Coverage.
2. Operators of construction activities resulting in land disturbance less than one acre that are part of a larger common plan of development or sale that ultimately disturbs one or more acres must apply for Construction General Permit Coverage. A larger common plan of development or sale is a contiguous area where separate and distinct construction activities may be taking place at different times on different schedules. General permit coverage is required if one or more acres of land will be disturbed, regardless of the size of the individually owned or developed sites. A larger common plan of development or sale applies to various types of land development including but not limited to residential, commercial, or industrial use.
3. For permit coverage under a Construction Activity General Permit issued by the Board for a state or federal agency that administers a project in accordance with approved annual standards and specifications, a Phase I Land Clearing permit is required for areas of disturbance equal to or greater than 5 acres. A Phase II Land Clearing permit is required for areas of disturbance equal to or greater than 1 acre and less than 5 acres.
4. Permit document samples are provided at the end of this specification section and shall be used for reference only. For further information and to download pdf copies of the latest permit documentation, please visit: http://www.deq.virginia.gov/Programs/Water/StormwaterManagement/VSMPPermits/ConstructionGeneralPermit.aspx.

D. The Contractor shall conduct the storm water management practices in accordance with local regulations and governing authorities, the VSMP Permit regulations, and any enforcement action taken or imposed by federal, state, or local agencies. The cost of any fines, construction delays, and remedial actions resulting from the Contractor's failure to comply with all provisions of local regulations and VSMP Permit requirements shall be paid for by the Contractor at no additional cost to the Owner.

E. As a requirement of the VSMP permitting program, each contractor and subcontractor shall execute a Contractor's Certification Form indicating that they have read and understand the regulations.

F. The respective Contractor(s) who filed a Registration Statement Form shall prepare and file a VSMP General Permit Notice of Termination (NOT) form. A Notice of Termination form may only be submitted after one or more of the following conditions have been met:

1. Final stabilization has been achieved on all portions of the site for which the operation is responsible;
2. Another operator has assumed control over all areas of the site that have not been finally stabilized;
3. Coverage under an alternative VPDES or VSMP permit has been obtained; or
4. For residential construction only, temporary stabilization has been completed and the residence has been transferred to the homeowner.

G. The Notice of Termination (NOT) form must be submitted within 30 days of one of the above conditions being met. Authorization to discharge terminates seven (7) days after the Notice of Termination is submitted. For the purposes of this permit, a Notice of Termination that is mailed is considered submitted once it is postmarked.

1.2 RELATED SECTIONS

A. N/A

1.3 REFERENCES

A. Virginia Stormwater Management Act – Code of Virginia Stormwater Law (Effective as of July 1, 2006).

B. Virginia Stormwater Management Program (VSMP) Regulations.

C. General Permit for Discharges of Stormwater from Construction Activities – Authorization to Discharge Under the Virginia Stormwater Management Program and the Virginia Stormwater Management Act**.**

D. Guidance Manual – "Storm Water Management for Construction Activities, Developing Pollution Prevention Plans and Best Management Practices" (EPA 832-R-005)**.**

E. Summary of Guidance Manual – "Storm Water Management for Construction Activities, Developing Pollution Prevention Plans and Best Management Practices" (EPA).

1.4 SUBMITTALS

A. Submit a copy of the VSMP General Permit Registration Statement filed with DEQ.

B. Submit a copy of the VSMP General Permit Notice of Termination (NOT) filed with DEQ at completion of project.

1.5 INSPECTIONS

A. Inspections by qualified personnel must be conducted of all areas of the site disturbed by construction activity, and areas used for storage of materials that are exposed to stormwater. "Qualified Personnel" means a licensed professional engineer, responsible land disturber (RLD), or other knowledgeable person who (i) holds a certificate of competence from the board in the area of the project inspection; or (ii) is enrolled in the board's training program for project inspection or combined administrator and successfully completes such program within one year of enrollment.

B. Inspections shall be conducted at least once every 14 calendar days and within 48 hours of the end of any runoff producing storm event. Where areas have been finally or temporarily stabilized or runoff is unlikely due to winter conditions (e.g., the site is covered with snow or ice, or frozen ground exists) such inspections shall be conducted at least once every month.

C. A report summarizing the scope of the inspection, names and qualifications of personnel making the inspection, the dates of the inspection, major observations relating to the implementation of the SWPPP, and actions taken in accordance with Section II.D4.d of the VSMP Permit shall be made and retained as part of the SWPPP in accordance with Section III.B. of the VSMP Permit. The report shall identify any incidents of noncompliance. Where a report does not identify any incidents of noncompliance, the report shall contain a certification that the facility is in compliance with the SWPPP and the VSMP Permit.

PART 2 – PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 EROSION CONTROL DEVICES

A. Erosion control devices shall be constructed as shown on the SWPPP.

3.2 STORM WATER POLLUTION PREVENTION PRINCIPLES

A. The following general principles shall be followed by the Contractor in preparing the SWPPP and during the construction phase:

1. Protect and maintain existing vegetation wherever possible.
2. Minimize the area of disturbance.
3. To the extent possible, route unpolluted flows around disturbed areas.
4. Install mitigation devices as early as possible.
5. Minimize the time disturbed areas are left unstabilized.
6. Maintain erosion and siltation control devices in proper condition.

3.3 CONTRACTOR'S STORM WATER POLLUTION PREVENTION PLAN

A. The Contract Drawings and Specifications identify a portion of the required facilities and temporary erosion and sedimentation control devices. The Contractor shall prepare a SWPPP in accordance with VSMP Permit requirements which identifies the location of construction facilities and proposes additional erosion and sedimentation control measures as required to minimize pollution. The Contractor's SWPPP shall include provisions for, but not be limited to the following:

1. Project construction and sequencing.
2. Construction trailers.
3. Laydown areas.
4. Equipment storage areas.
5. Stockpile areas.
6. Spill response procedures.

B. Reproducible copies of one or more of the Contract Drawings will be provided to the Contractor to serve as a base for the Contractor to develop a SWPPP and modify as necessary as construction proceeds.

STORM WATER POLLUTION PREVENTION PLAN

CONTRACTOR'S CERTIFICATION

PROJECT: _____

ADDRESS _____

DATE: _____

CONTRACTOR/SUBCONTRACTOR:

NAME: _____

ADDRESS: _____

I certify under penalty of law that I understand the terms of conditions of the Virginia Stormwater Management Program (VSMP) General Permit that authorizes the storm water discharges associated with industrial activity from the construction site identified as part of this certification.

_____ _____
Signature Date

_____
Title

_____
Company

Registration Statement
General VPDES Permit for Discharges of Stormwater from Construction Activities (VAR10)

(Please Type or Print All Information)

1. **Construction Activity Operator:** *(General permit coverage will be issued to this operator. The Certification in Item #12 must be signed by the appropriate person associated with this operator.)*

   Name:_____

   Contact:_____

   Mailing Address:_____

   City:_____ State:_____ Zip:_____ Phone:_____

   Email address (if available):_____

   Indicate if DEQ may transmit general permit correspondence electronically: Yes ☐ No ☐

2. **Existing General Permit Registration Number (for renewals only):**_____

3. **Name and Location of the Construction Activity:**

   Name:_____

   Address (if available):_____

   City:_____ State:_____ Zip:_____

   County (if not located within a City):_____

   Latitude (decimal degrees):_____ Longitude (decimal degrees):_____

   Name and Location of all Off-site Support Activities to be covered under the general permit:

   Name:_____

   Address (if available):_____

   City:_____ State:_____ Zip:_____

   County (if not located within a City):_____

   Latitude (decimal degrees):_____ Longitude (decimal degrees):_____

4. **Status of the Construction Activity (check only one):** Federal ☐ State ☐ Public ☐ Private ☐

5. **Nature of the Construction Activity (e.g., commercial, industrial, residential, agricultural, oil and gas, etc.):**

   _____

6. **Name of the Receiving Water(s) and Hydrologic Unit Code (HUC):**

   Name:_____ Name:_____

   HUC:_____ HUC:_____

7. **If the discharge is through a Municipal Separate Storm Sewer System (MS4), the name of the MS4 operator:**

   _____

8. **Estimated Project Start and Completion Date:**

   Start Date (mm/dd/yyyy):_____ Completion Date (mm/dd/yyyy):_____

9. **Total Land Area of Development (to the nearest one-hundredth acre):**_____

   Estimated Area to be Disturbed (to the nearest one-hundredth acre):_____

10. **Is the area to be disturbed part of a larger common plan of development or sale?** Yes ☐ No ☐

11. **A stormwater pollution prevention plan (SWPPP) must be prepared in accordance with the requirements of the General VPDES Permit for Discharges of Stormwater from Construction Activities <u>prior to</u> submitting this Registration Statement. By signing this Registration Statement the operator is certifying that the SWPPP has been prepared.**

12. **Certification:** "I certify under penalty of law that I have read and understand this Registration Statement and that this document and all attachments were prepared in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is to the best of my knowledge and belief true, accurate, and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment for knowing violations."

    Printed Name:_____ Title:_____

Notice of Termination
General VPDES Permit for Discharges of Stormwater from Construction Activities (VAR10)

(Please Type or Print All Information)

1. **Construction Activity Operator:**

   Name:_____

   Contact:_____

   Mailing Address:_____

   City:_____ State:_____ Zip:_____ Phone: _____

   Email address (if available):_____

2. **Name and Location of the Construction Activity:** (As listed on the Registration Statement.)

   Name:_____

   Address (if available):_____

   City:_____ State:_____ Zip:_____

   County (if not located within a City):_____

   Latitude (decimal degrees):_____ Longitude (decimal degrees):_____

3. **General Permit Registration Number:**_____

4. **Reason for Terminating Coverage Under the General Permit:** (The operator shall submit a Notice of Termination after one or more of the following conditions have been met.)

   ☐ A. Necessary permanent control measures included in the SWPPP for the site are in place and functioning effectively and final stabilization has been achieved on all portions of the site for which the operator is responsible. <u>When applicable, long-term responsibility and maintenance requirements for permanent control measures shall be recorded in the local land records prior to the submission of a notice of termination</u>;

   ☐ B. Another operator has assumed control over all areas of the site that have not been finally stabilized and obtained coverage for the ongoing discharge;

   ☐ C. Coverage under an alternative VPDES or state permit has been obtained; or

   ☐ D. For residential construction only, temporary soil stabilization has been completed and the residence has been transferred to the homeowner.

   The notice of termination should be submitted no later than 30 days after one of the above conditions being met. Authorization to discharge terminates at midnight on the date that the notice of termination is submitted for the conditions set forth in subsections B through D above, unless otherwise notified by the VSMP authority or the Department. Termination of authorizations to discharge for the conditions set forth in subsection A above shall be effective upon notification from the Department that the provisions of subsection A have been met or 60 days after submittal of the notice of terminations, whichever occurs first.

5. **Permanent Control Measures Installed:** (When applicable, a list of the on-site and off-site permanent control measures (both structural and nonstructural) that were installed to comply with the stormwater management technical criteria. Attach a separate list if additional space is needed.)

   <u>Permanent Control Measure #1</u>

   Type of Permanent Control Measure:_____

   Date Functional:_____

   Address (if available):_____

   City:_____ State:_____ Zip:_____

   County (if not located within a City):_____

   Latitude (decimal degrees):_____ Longitude (decimal degrees):_____

   Receiving Water:

Permanent Control Measure #2

Type of Permanent Control Measure:_____

Date Functional:_____

Address (if available):_____

City:_____ State:_____ Zip:_____

County (if not located within a City):_____

Latitude (decimal degrees):_____ Longitude (decimal degrees):_____

Receiving Water:_____

Total Acres Treated:_____ Impervious Acres Treated:_____

Permanent Control Measure #3

Type of Permanent Control Measure:_____

Date Functional:_____

Address (if available):_____

City:_____ State:_____ Zip:_____

County (if not located within a City):_____

Latitude (decimal degrees):_____ Longitude (decimal degrees):_____

Receiving Water:_____

Total Acres Treated:_____ Impervious Acres Treated:_____

6. **Participation in a Regional Stormwater Management Plan:** (When applicable, information related to the participation in a regional stormwater management plan. Attach a separate list if additional space is needed.)

Regional Stormwater Management Facility

Type of Regional Stormwater Management Facility:_____

Address (if available):_____

City:_____ State:_____ Zip:_____

County (if not located within a City):_____

Latitude (decimal degrees):_____ Longitude (decimal degrees):_____

Total Site Acres Treated:_____ Impervious Site Acres Treated:_____

7. **Perpetual Nutrient Credits:** (When applicable, information related to perpetual nutrient credits that were acquired in accordance with § 62.1-44.15:35 of the Code of Virginia. Attach a separate list if additional space is needed.)

Nonpoint Nutrient Credit Generating Entity

Name:_____

Perpetual Nutrient Credits Acquired (lbs/acre/year):_____

8. **Certification:** "I certify under penalty of law that I have read and understand this Notice of Termination and that this document and all attachments were prepared in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is to the best of my knowledge and belief true, accurate, and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment for knowing violations."

Printed Name:_____ Title:_____

Signature:_____ Date:_____

(Please sign in INK. This Certification must be signed by the appropriate person associated with the operator identified in Item #1.)

SECTION 011000 – SUMMARY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of award, including all terms and conditions.

1.2 WORK COVERED BY CONTRACT DOCUMENTS

A. Project Identification: Bluestone Trail Extension
   1. Project Location: Harrisonburg, Virginia

B. Contract Owner: City of Harrisonburg
   1. Representative: Kim Cameron, Public Works Engineer

C. Property Owner: James Madison University
   1. Representative: Abram T. Kaufman, Project Manager, Facilities Management.

All references to OWNER shall be for CONTRACT and/or PROPERTY OWNER

D. Engineer: Vanasse Hangen Brustlin, Inc. of Virginia Beach, Virginia

E. Briefly, and without force and effect upon the Contract Documents, the work of the contract can be summarized as follows:
   1. The Work includes a multi-use paved pathway along the north side of Bluestone Drive. The pathway with connect to existing path and link pedestrian and bicycle traffic from Port Republic Road to Bridgeforth Stadium and central portions on the James Madison University campus. Site improvements include earthwork, pavement and concrete flat work, and drainage and erosion control measures.

F. Use of Professional Seals on Bidding, Procurement, and Contract Documents: For the purposes of this paragraph, the term “Regulant” refers to the individual who signs and seals parts of the Contract Documents (e.g. the Drawings and Specifications). Certain information has been excerpted verbatim from a source or sources (e.g., UL Assemblies, SMACNA details, IBC code text) which was considered or used by Regulant in preparing parts of the Contract Documents, as follows:
   1. The excerpted information was neither prepared under the direct control nor personal supervision nor created by the Regulant, as it was prepared by the source and owner of the excerpted information.
   2. For purposes of bidding, procuring, and performance of the Work, and in any event of conflicts or ambiguities between the excerpted information in the Contract Documents and the requirements of applicable codes and standards, provide the better quality or greater quantity of Work which, at a minimum, complies with the requirements of the applicable codes and standards.
   3. Advise Engineer immediately upon becoming aware of requirements of the Work which are not consistent with the requirements of the excerpted information.

4. Attribution is acknowledged for information obtained and included herein verbatim from other source or sources.
5. Regulant has taken into consideration and used certain excerpted information from other sources which are applicable to the Contract Documents, and the Regulant indicates by it's seal that it is assuming responsibility for its services in use and application of the excerpted information to the requirements of Work, but not for the excerpted information itself which was prepared by others. Regulant does not indicate by its seal that it is responsible for use or application of other information in such source or sources which was not included herein.

1.3 TYPE OF CONTRACT

A. Non-professional services needed for construction or facilities maintenance.

1.4 WORK PHASES

A. The Work shall be conducted in a single phase.

B. Before commencing Work, submit a schedule showing the sequence, commencement and completion dates, for all Work.

1.5 WORK UNDER OTHER CONTRACTS

A. General: Cooperate fully with separate contractors so work on those contracts may be carried out smoothly, without interfering with or delaying work under this Contract.

1.6 USE OF PREMISES

A. General: Contractor shall have limited use of premises for construction operations as indicated on Drawings by the Contract limits.

B. Use of Site: Limit use of premises to areas within the Contract limits indicated. Do not disturb portions of Project site beyond areas in which the Work is indicated.
   1. Owner Occupancy: Allow for Owner occupancy of Project site and use by the public as outlined by the Construction Manager.
   2. Driveways and Entrances: Keep driveways parking garage, loading areas, and entrances serving premises clear and available to Owner, Owner's employees, and emergency vehicles at all times. Do not use these areas for parking or storage of materials.
      a. Schedule deliveries to minimize use of driveways and entrances.
      b. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.

1.7 OWNER'S OCCUPANCY REQUIREMENTS

A. Full Owner Occupancy: Owner will occupy site during entire construction period. Cooperate with Owner during construction operations to minimize conflicts and facilitate Owner usage. Perform the Work so as not to interfere with Owner's day-to-day operations. Maintain existing exits, unless otherwise indicated.

1. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities. Do not close or obstruct walkways, corridors, or other occupied or used facilities without written permission from Owner and authorities having jurisdiction.
2. Provide not less than 72 hours' notice to Owner of activities that will affect Owner's operations.

1.8 WORK RESTRICTIONS

A. Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:
   1. Notify Construction Manager not less than two days in advance of proposed utility interruptions.
   2. Do not proceed with utility interruptions without Construction Manager's written permission.

1.9 CONSTRUCTION SEQUENCING PROCEDURES:

A. Coordination: Refer to the Contract Documents and coordinate all work which is shown on the drawings and included in the Project Manual as part of the project, and complete such work during stipulated dates indicated.

B. After the award of the Contract for the project, prepare and submit for the Engineer’s and Owner’s approval a final Construction Schedule for all proposed work. The Construction Schedule shall be prepared to reflect the sequence of each area of work.

C. Coordination: Coordinate daily functions and activities to make certain there are no interruptions. The Owner’s representative at the facility will be designated at the pre-construction conference. The Contractor on the project shall cooperate with and coordinate construction activities with the Owner’s designated representative. Delay claims, resulting from failure to coordinate work and cooperate with the Owner’s designated representative will not be allowed.

1.10 GENERAL SEQUENCING GUIDELINES:

A. It is required that the Contractor and all Subcontractors carefully phase the work to permit orderly flow of vehicular traffic during construction.

B. Construction site access, isolation of construction operations, safety measures, and other issues will be coordinated and clarified at Pre-construction conference as outlined in the Contract Documents.

C. Provide security measures to protect the existing building and site construction areas during the entire contract period. Any damage to the existing buildings or surrounding site construction areas due to lack of security shall be repaired or replaced by the General Contractor to the satisfaction of the Owner and at no additional cost to the Owner. No increase in the completion time(s) will be allowed for any security-related problems.

D. Coordinate and schedule security measures with the Owner.

E. Provide self-contained toilet units in the exterior staging area. The Owner’s interior building toilet facilities shall be “off-limits” to all construction personnel.

F. After hours and week-end work shall be coordinated in advance with the Owner.

G. Verify all existing grades, lines, levels, and horizontal and vertical dimensions, prior to commencing construction operations. Report any errors or inconsistencies to the Engineer BEFORE beginning any work on this project.

H. Provide a Rodent and Pest Management plan. Coordinate with Owner and A/E.

I. Soil and Sediment Erosion Control: The Contractor is required to strictly observe regulations regarding erosion and sediment control procedures. If corrective action is required and not responded to within 24 hours of notice the Owner shall reserve the rights to perform the work and back charge the Contractor.

1.11 PATCH AND REPAIRING:

A. Replace all concrete walks, curbs, gutters, paving, and topsoil and seed where such is not indicated to be disturbed, where disturbed by construction work, to the satisfaction of the Owner.

1.12 PROTECTION AND SECURITY OF THE EXISTING BUILDING:

A. Any damage to building due to the Contractor providing inadequate protection or security shall be repaired using matching materials at no cost to Owner.

1.13 CONNECTIONS TO EXISTING WORK

1. The Contractor shall provide all interface and tie-in connections of the Work to all existing work and adjustments to the existing work, as necessary. All Work of this contract and existing in-place work shall function as complete system[s] upon completion of the project.

1.14 CLEANING AND PROTECTION:

A. General:

1. During handling and installation, clean and protect construction in progress and adjoining materials in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.
2. Supervise construction activities to ensure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.
3. Retain stored items in orderly arrangement allowing maximum access, not impeding traffic or drainage.
4. Do not allow accumulation of scrap, debris, waste material, other items not required for construction of this work.
5. At least twice each month, and more often if necessary, completely remove all scrap, debris, and waste material from the job site.
6. Provide adequate storage for all items awaiting removal from the job site, observing requirements for fire protection and protection of the ecology.

B. Site:

1. Daily, and more often if necessary, inspect the site and pick up all scrap, debris, and waste material. Remove such items to place designated for their storage.
2. Weekly, and more often if necessary, inspect all arrangements of materials stored on the site. Restack, tidy, or otherwise service arrangements to meet requirements of subparagraph above.
3. Maintain the site in neat, orderly condition at all times.

1.15 SOILS INVESTIGATION

A. Soils investigations have been performed for the Owner. The Engineer and Owner assume no responsibility for actual subsurface conditions, however, boring log information can be found in the planset.

B. If the Bidder deems the soils investigations to be inadequate or inaccurate, he may conduct his own investigation at his own expense. Prior to bid opening, bidder must inform the Owner and the Engineer in writing of his concern and obtain permission in writing to conduct his investigation.

1.16 DRAWINGS AND SPECIFICATIONS

A. The successful Contractor shall be responsible for including all items and parts of the Work, as defined by requirements of the Contract Documents. Unless the Contract Documents specifically designate an item of part of the Work that is to be provided by a Subcontractor, then it is the sole responsibility of the Contractor to determine and allocate/assign the performance of each item or part of the Work. The Contractor shall not be entitled to any compensation or adjustment of time or to any other Claim due to any provision of the Contract Documents which assigns or allocates, or fails to assign or allocate, the performance of any item or part of the Work to any specific Subcontractor of Contractor. In no event shall the Contractor be entitled to request an interpretation or decision by, or any determination or instruction from, the Engineer concerning or about any assignment or allocation of parts of the Work. The Engineer will not be responsible to arbitrate or otherwise resolve any dispute or differences about such allocation or assignment between Contractor and any Subcontractors.

B. “Summary” and “Related Sections” provisions in the Specifications, if any are stated or referred to in any Specification, are provided only for general reference and for convenience, and do not limit or alter in any way the requirements for the provision of the Work in the Contract Documents. Items or parts of the Work, and related provisions of the Contract Documents, even though not listed or stated in any Summary or Related Section provision, but which are indicated elsewhere in the Contract Documents, shall be included in the Work. Even though a Summary or Related Section may not refer to, state, or list each and every part of the Contract Documents which may include provisions about a specific item or part of the Work, all of the other applicable provisions of the Contract Documents remain in full force and effect, and shall be included in determining the requirements for the Work.

END OF SECTION 011000

SECTION 013300 - SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Provisions of the Contract and of the Contract Documents apply to this Section.

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, Sustainable Design data, and other submittals.

1.3 DEFINITIONS

A. Action Submittals: Written and graphic information that requires Architect's responsive action.

B. Informational Submittals: Written information that does not require Architect's responsive action. Submittals may be rejected for not complying with requirements.

1.4 SUBMITTAL PROCEDURES

A. Electronic (CAD) Files: The Contractor may request electronic (CAD) files in writing.

B. Completeness: Submittals shall be complete in every respect and bound in sets. Each Submittal shall be clearly marked to show each item, component and optional feature proposed to be incorporated into the Project.

1. Incomplete submittals and submittals not reviewed for compliance and coordination by the Contractor may be returned without action. Incomplete submittal packages returned without action or for additional information are not subject to delay claims.

C. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.

1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
2. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.
   a. Architect/Engineer reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.

D. Submittals Schedule: Comply with requirements in Division 1 Section “Construction Progress Documentation” for list of submittals and time requirements for scheduled performance of related construction activities.

E. Processing Time: Allow enough time for submittal review, including time for resubmittals, in accordance with General Conditions and as follows. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.

1. Initial Review: Allow sufficient time for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Architect/Engineer will advise Contractor when a submittal being processed must be delayed for coordination.
2. Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.
3. Resubmittal Review: Allow sufficient time for review of each resubmittal.
4. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing or to allow for a resubmittal, if necessary.

F. Identification: Place a permanent label or title block on each submittal for identification.
1. Indicate name of firm or entity that prepared each submittal on label or title block.
2. Provide a space approximately 6 by 8 inches (150 by 200 mm) on label or beside title block to record Contractor's review and approval markings and action taken by Architect.
3. Include the following information on label for processing and recording action taken:
   a. Project name.
   b. Date.
   c. Project code:
   d. Name and address of Architect/Engineer.
   e. Name and address of Contractor.
   f. Name and address of subcontractor.
   g. Name and address of supplier.
   h. Name of manufacturer.
   i. Submittal number or other unique identifier, including revision identifier.
      1) Submittal number shall use Specification Section number followed by a decimal point and then a sequential number (e.g., 06100.01). Resubmittals shall include an alphabetic suffix after another decimal point (e.g., 06100.01.A).
   j. Number and title of appropriate Specification Section.
   k. Drawing number and detail references, as appropriate.
   l. Location(s) where product is to be installed, as appropriate.
   m. Other necessary identification.

G. Deviations: Highlight, encircle, or otherwise identify deviations from Contract Documents on submittals.

H. Additional Copies: Unless additional copies are required for final submittal, and unless Architect/Engineer observes noncompliance with provisions in the Contract Documents, initial submittal may serve as final submittal.
1. Submit one copy of submittal to concurrent reviewer in addition to specified number of copies to Architect/Engineer.
2. Additional copies submitted for maintenance manuals will **not** be marked with action taken and will be returned.

I. Transmittal: Package each submittal individually and appropriately for transmittal and handling. Transmit each submittal using a transmittal form. Architect will return submittals, without review, received from sources other than Contractor.

1. Include Contractor's certification stating that information submitted complies with requirements of the Contract Documents.
2. On an attached separate sheet, prepared on Contractor's letterhead, record relevant information, requests for data, revisions other than those requested by Architect on previous submittals, and deviations from requirements in the Contract Documents, including minor variations and limitations. Include same label information as related submittal.

J. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.

1. Note date and content of previous submittal.
2. Note date and content of revision in label or title block and indicate extent of revision.
3. Resubmit submittals until Architect’s action indicates Work may proceed.

K. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.

L. Use for Construction: Use only final submittals with mark indicating action taken by Architect/Engineer in connection with construction.

PART 2 - PRODUCTS

2.1 ACTION SUBMITTALS

A. General: Prepare and submit Action Submittals required by individual Specification Sections.

B. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.

1. If information must be specially prepared for submittal because standard printed data are not suitable for use, submit as Shop Drawings, not as Product Data.
2. Mark each copy of each submittal to show which products and options are applicable.
3. Include the following information, as applicable:
   a. Manufacturer's written recommendations.
   b. Manufacturer's product specifications.
   c. Manufacturer's installation instructions.
   d. Standard color charts.
   e. Manufacturer's catalog cuts.
   f. Wiring diagrams showing factory-installed wiring.
   g. Printed performance curves.
   h. Operational range diagrams.
   i. Mill reports.
   j. Standard product operation and maintenance manuals.
   k. Compliance with specified referenced standards.
   l. Testing by recognized testing agency.

m. Application of testing agency labels and seals.
n. Notation of coordination requirements.

4. Submit Product Data before or concurrent with Samples.

5. Number of Copies: Submit six copies of Product Data, unless otherwise indicated. Architect will return two copies. Mark up and retain one returned copy as a Project Record Document.

C. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data.

1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:

a. Dimensions.
b. Identification of products.
c. Fabrication and installation drawings.
d. Roughing-in and setting diagrams.
e. Wiring diagrams showing field-installed wiring, including power, signal, and control wiring.
f. Shopwork manufacturing instructions.
g. Templates and patterns.
h. Schedules.
i. Design calculations.
j. Compliance with specified standards.
k. Notation of coordination requirements.
l. Notation of dimensions established by field measurement.
m. Relationship to adjoining construction clearly indicated.
n. Seal and signature of professional engineer if specified.
o. Wiring Diagrams: Differentiate between manufacturer-installed and field-installed wiring.

2. Sheet Size: Except for templates, patterns, and similar full-size drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches but no larger than 30 by 42 inches (standard E size).

D. Samples: Submit Samples for review of kind, color, pattern, and texture for a check of these characteristics with other elements and for a comparison of these characteristics between submittal and actual component as delivered and installed.

1. Transmit Samples that contain multiple, related components such as accessories together in one submittal package.

2. Identification: Attach label on unexposed side of Samples that includes the following:

a. Generic description of Sample.
b. Product name and name of manufacturer.
c. Sample source.
d. Number and title of appropriate Specification Section.

3. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.

a. Samples that may be incorporated into Work are indicated in individual Specification Sections. Such Samples must be in an undamaged condition at time of use.

b. Samples not incorporated into the Work, or otherwise designated as Owner's property, are the property of Contractor.

4. Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available.

a. Number of Samples: Submit one full set(s) of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Architect/Engineer will return submittal with options selected.

5. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from same material to be used for the Work, cured and finished in manner specified, and physically identical with material or product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited to, the following: partial sections of manufactured or fabricated components; small cuts or containers of materials; complete units of repetitively used materials; swatches showing color, texture, and pattern; color range sets; and components used for independent testing and inspection.

a. Number of Samples: Submit three sets of Samples. Architect/Engineer will retain two Sample sets; remainder will be returned.

1) Submit a single Sample where assembly details, workmanship, fabrication techniques, connections, operation, and other similar characteristics are to be demonstrated.

2) If variation in color, pattern, texture, or other characteristic is inherent in material or product represented by a Sample, submit at least three sets of paired units that show approximate limits of variations.

E. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design. Include the following information in tabular form:

1. Name, address, and telephone number of entity performing subcontract or supplying products.

2. Number and title of related Specification Section(s) covered by subcontract.

3. Drawing number and detail references, as appropriate, covered by subcontract.

4. Number of Copies: Submit three copies of subcontractor list, unless otherwise indicated. Architect will return two copies.

a. Mark up and retain one returned copy as a Project Record Document.

2.2 INFORMATIONAL SUBMITTALS

A. General: Prepare and submit Informational Submittals required by other Specification Sections.

1. Number of Copies: Submit two copies of each submittal, unless otherwise indicated. Architect will not return copies.

2. Certificates and Certifications: Provide a notarized statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity.
3. Test and Inspection Reports: Comply with requirements specified in Section 1000 Supplementary Specifications.

B. Contractor's Construction Schedule: Comply with requirements specified in Division 1 Section "Construction Progress Documentation."

C. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.

D. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements in the Contract Documents. Submit record of Welding Procedure Specification (WPS) and Procedure Qualification Record (PQR) on AWS forms. Include names of firms and personnel certified.

E. Installer Certificates: Prepare written statements on manufacturer's letterhead certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.

F. Manufacturer Certificates: Prepare written statements on manufacturer's letterhead certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.

G. Product Certificates: Prepare written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.

H. Material Certificates: Prepare written statements on manufacturer's letterhead certifying that material complies with requirements in the Contract Documents.

I. Material Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements in the Contract Documents.

J. Product Test Reports: Prepare written reports indicating current product produced by manufacturer complies with requirements in the Contract Documents. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.

K. Research/Evaluation Reports: Prepare written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project. Include the following information:
1. Name of evaluation organization.
2. Date of evaluation.
3. Time period when report is in effect.
4. Product and manufacturers' names.
5. Description of product.
6. Test procedures and results.
7. Limitations of use.

L. Preconstruction Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements in the Contract Documents.

M. Compatibility Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for primers and substrate preparation needed for adhesion.

N. Field Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements in the Contract Documents.

O. Maintenance Data: Prepare written and graphic instructions and procedures for operation and normal maintenance of products and equipment.

P. Design Data: Prepare written and graphic information, including, but not limited to, performance and design criteria, list of applicable codes and regulations, and calculations. Include list of assumptions and other performance and design criteria and a summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Include page numbers.

Q. Manufacturer's Instructions: Prepare written or published information that documents manufacturer's recommendations, guidelines, and procedures for installing or operating a product or equipment. Include name of product and name, address, and telephone number of manufacturer. Include the following, as applicable:

1. Preparation of substrates.
2. Required substrate tolerances.
3. Sequence of installation or erection.
4. Required installation tolerances.
5. Required adjustments.
6. Recommendations for cleaning and protection.

R. Manufacturer's Field Reports: Prepare written information documenting factory-authorized service representative's tests and inspections. Include the following, as applicable:

1. Name, address, and telephone number of factory-authorized service representative making report.
2. Statement on condition of substrates and their acceptability for installation of product.
3. Statement that products at Project site comply with requirements.
4. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
5. Results of operational and other tests and a statement of whether observed performance complies with requirements.
6. Statement whether conditions, products, and installation will affect warranty.
7. Other required items indicated in individual Specification Sections.

S. Insurance Certificates and Bonds: Prepare written information indicating current status of insurance or bonding coverage. Include name of entity covered by insurance or bond, limits of coverage, amounts of deductibles, if any, and term of the coverage.

PART 3 - EXECUTION

3.1 CONTRACTOR'S REVIEW

A. Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Architect/Engineer.

B. Approval Stamp: Stamp each submittal with a uniform, approval stamp. Include Project name and location, submittal number, Specification Section title and number, name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.

3.2 ARCHITECT'S ACTION

A. General: Architect/Engineer will not review submittals that do not bear Contractor's approval stamp and will return them without action.

B. Action Submittals: Architect/Engineer will review each submittal, make marks to indicate corrections or modifications required, and return it. The Architect/Engineer will attach a comment sheet that will indicate what “action” the Contractor shall take. “Actions” and review procedure will be clarified at the Preconstruction Conference.

C. Informational Submittals: Architect/Engineer will review each submittal and will not return it, or will reject and return it if it does not comply with requirements. Architect/Engineer will forward each submittal to appropriate party.

D. Partial submittals are not acceptable, will be considered non-responsive, and will be returned without review.

E. Submittals not required by the Contract Documents may not be reviewed and may be discarded.

END OF SECTION 013300

SECTION 018900 - SITE CONSTRUCTION PERFORMANCE REQUIREMENTS

PART 1 - GENERAL

1.1 DESCRIPTION

A. This Section specifies the general requirements for the site work included in the Contract.

1.2 PERMITS

A. Unless otherwise provided in the Supplementary Specifications, the Contractor shall obtain and pay for all construction permits and licenses. The Owner shall assist Contractor, when necessary, in obtaining such permits and licenses. The Contractor shall pay all charges and inspection fees necessary for the prosecution of the Work, and shall pay all charges of utility owners for connections to the Work.

1.3 LAWS AND REGULATIONS

A. Contractor shall give all notices and comply with all laws and regulations applicable to furnishing and performance of the Work.

B. If the Contractor performs any work that is contrary to laws or regulations, the Contractor shall bear all claims, costs, losses and damages caused by, arising out of or resulting therefrom.

1.4 UTILITIES

A. Shown or Indicated*:* The information and data shown or indicated in the Contract Documents with respect to existing underground facilities (utilities) at or contiguous to the site is based on information and data furnished to Owner or Engineer by the owners of such underground facilities (utilities) or by others.

1. The Owner and Engineer shall not be responsible for the accuracy or completeness of any such information or data; and

2. The cost of all of the following will be included in the Contract and Contractor shall have full responsibility for: (i) reviewing and checking all such information and data; (ii) locating all underground facilities (utilities) shown or indicated in the Contract Documents; (iii) coordination of the Work with the owners of such underground facilities (utilities) during construction; and (iv) the safety and protection of all such underground facilities (utilities) and repairing any damage thereto resulting from the Work.

B. Not Shown or Indicated: If an underground facility (utility) is uncovered or revealed at or contiguous to the site which was not shown or indicated in the Contract Documents, the Contractor shall, promptly after becoming aware thereof and before further disturbing

conditions affected thereby or performing any Work in connection therewith (except in an emergency), identify the owner of such underground facility (utility) and give written notice to that facility (utility) owner and to Owner and Engineer. Engineer will promptly review the underground facility (utility) and determine the extent, if any, to which a change is required in the Contract Documents to reflect and document the consequences of the existence of the underground facility (utility). If the Engineer concludes that a change in the Contract Documents is required, revised plans and specifications will be issued to reflect and document such consequences. During such time, the Contractor shall be responsible for the safety and protection of such underground facility (utility).

C. Contractor shall notify all municipal agencies and utility companies owning or operating utilities, of proposed work affecting the utilities, or agencies.

D. Contractor shall give written notification within the time period required by the agency or company for advance notification. A copy of the notification shall be furnished to the Engineer.

E. Contractor shall notify ”MISS UTILITY OF VIRGINIA” at 811 in Virginia or 1-800-552-7001 before commencing any work in the vicinity of existing subsurface utilities.

F. Contractor shall secure in-place existing utilities whose support is affected by the work and cooperate and assist the agency or company operating the utility in maintaining the utility services. Contractor shall correct any damage to the utilities caused by construction operations by repair or replacement, as required by the utility owner. When the repair or replacement is made by the utility owner, Contractor shall pay all costs assessed by the utility owner for the work.

G. If the existing utilities are found to conflict with the proposed work, the Contractor shall protect and maintain the utilities and take measurements to determine the location, type and dimensions of the utility. The information shall be furnished to the Engineer who will determine the changes required in the proposed work or existing utilities to resolve the conflict as soon thereafter as is reasonable.

H. Contractor shall verify the location, size, invert elevation and type of existing facilities at all points of connection prior to ordering new utility materials.

1.5 SOILS INFORMATION

A. A geotechnical report on site soil conditions has been prepared for the Owner.

B. Contractor may make additional subsurface explorations upon written request to, and upon approval by, the Owner at no additional cost to the Owner.

1.6 SOIL SUPPORT

A. Contractor shall furnish and install excavation soil support devices or use soil strengthening techniques required to perform excavations in accordance with the current requirements of the

U.S. Department of Labor, Occupational Health & Safety Administration and all federal, state, and municipal laws and regulations.

1.7 REFERENCE STANDARDS

A. References are made to technical societies, organizations and groups using the following abbreviations. All work so referred shall conform to the current edition of the referenced standard.

AASHTO	American Association of State Highway Transportation Officials
ACI	American Concrete Institute
ACOE	United States Army Corps of Engineers
AGC	Associated General Contractors of America
ANSI	American National Standards Institute
AOAC	Association of Official Agricultural Chemists
ASTM	American Society for Testing and Materials
AWPA	American Wood Preservers Association
AWWA	American Water Works Association
NEMA	National Electrical Manufacturers Association
OSHA	Occupational Safety and Health Administration
UL	Underwriters Laboratory

1.8 TRAFFIC MAINTENANCE

A. Contractor shall maintain access to the site and through the work zones for personnel and vehicles of emergency services, utility agencies, inspection services, and others authorized to enter, move about and work on the site.

B. When work is required on public roadways, Contractor shall furnish, install, maintain, and remove all signs, drums, barricades, steel plates, and other devices required by the federal or state government or municipality to maintain and protect pedestrians and vehicular traffic.

C. Protective measures shall be installed at site access points to prevent mud and other debris from being deposited on the public roadways by construction traffic. The public roadways shall be swept as required to remove any deposits.

1.9 STATE AND LOCAL REFERENCE STANDARDS

A.

Building Code	International Building Code
DCR	Virginia Department of Conservation and Recreation
DEQ	Virginia Department of Environmental Quality
VAESCH	Virginia Erosion and Sediment Control Handbook

VDOT	Virginia Department of Transportation

END OF SECTION 018900

SECTION 260526 - GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract.

1.2 SUMMARY

A. Section includes grounding and bonding systems and equipment.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

1.4 INFORMATIONAL SUBMITTALS

A. As-Built Data: Plans showing dimensioned as-built locations of grounding features.

B. Field quality-control reports.

1.5 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For grounding to include in emergency, operation, and maintenance manuals.

1.6 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. Comply with UL 467 for grounding and bonding materials and equipment.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

1. Burndy; Part of Hubbell Electrical Systems.
2. ERICO International Corporation.
3. Galvan Industries, Inc.; Electrical Products Division, LLC.
4. ILSCO.
5. O-Z/Gedney; an EGS Electrical Group brand; an Emerson Industrial Automation business.

2.2 SYSTEM DESCRIPTION

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. Comply with UL 467 for grounding and bonding materials and equipment.

2.3 CONDUCTORS

A. Insulated Conductors: Copper wire or cable insulated for 600 V unless otherwise required by applicable Code or authorities having jurisdiction.

2.4 CONNECTORS

A. Listed and labeled by an NRTL acceptable to authorities having jurisdiction for applications in which used and for specific types, sizes, and combinations of conductors and other items connected.

B. Bolted Connectors for Conductors and Pipes: Copper or copper alloy.

PART 3 - EXECUTION

3.1 APPLICATIONS

A. Conductors: Install solid conductor for No. 8 AWG and smaller, and stranded conductors for No. 6 AWG and larger unless otherwise indicated.

B. Conductor Terminations and Connections:

1. Pipe and Equipment Grounding Conductor Terminations: Bolted connectors.

3.2 EQUIPMENT GROUNDING

A. Install insulated equipment grounding conductors with all branch circuits.

B. Install insulated equipment grounding conductors with the following items, in addition to those required by NFPA 70:

1. Branch circuits.
2. Lighting circuits.

C. Poles Supporting Outdoor Lighting Fixtures: Install grounding electrode and a separate insulated equipment grounding conductor in addition to grounding conductor installed with branch-circuit conductors.

3.3 INSTALLATION

A. Grounding Conductors: Route along shortest and straightest paths possible unless otherwise indicated or required by Code. Avoid obstructing access or placing conductors where they may be subjected to strain, impact, or damage.

B. Bonding Straps and Jumpers: Install in locations accessible for inspection and maintenance except where routed through short lengths of conduit.

1. Bonding to Structure: Bond straps directly to basic structure, taking care not to penetrate any adjacent parts.

3.4 FIELD QUALITY CONTROL

A. Perform tests and inspections.

B. Tests and Inspections:

1. After installing grounding system but before permanent electrical circuits have been energized, test for compliance with requirements.
2. Inspect physical and mechanical condition. Verify tightness of accessible, bolted, electrical connections with a calibrated torque wrench according to manufacturer's written instructions.

C. Prepare test and inspection reports.

D. Report measured ground resistances that exceed the following values:

1. Power and Lighting Equipment or System with Capacity of 500 kVA and Less: 10 ohms.

E. Excessive Ground Resistance: If resistance to ground exceeds specified values, notify Architect promptly and include recommendations to reduce ground resistance.

END OF SECTION 260526

SECTION 260533 - RACEWAYS AND BOXES FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract.

1.2 SUMMARY

A. Section Includes:

1. Metal conduits, tubing, and fittings.
2. Nonmetal conduits, tubing, and fittings.
3. Boxes, enclosures, and cabinets.

1.3 DEFINITIONS

A. ARC: Aluminum rigid conduit.

B. GRC: Galvanized rigid steel conduit.

C. IMC: Intermediate metal conduit.

1.4 ACTION SUBMITTALS

A. Product Data: For conduit and boxes.

1.5 INFORMATIONAL SUBMITTALS

A. Source quality-control reports.

PART 2 - PRODUCTS

2.1 METAL CONDUITS, TUBING, AND FITTINGS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

1. Allied Tube & Conduit.

2. O-Z/Gedney; an EGS Electrical Group brand; an Emerson Industrial Automation business.
3. Robroy Industries.
4. Thomas & Betts Corporation.

B. Listing and Labeling: Metal conduits, tubing, and fittings shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

C. GRC: Comply with ANSI C80.1 and UL 6.

D. EMT: Comply with ANSI C80.3 and UL 797.

E. FMC: Comply with UL 1; zinc-coated steel.

F. LFMC: Flexible steel conduit with PVC jacket and complying with UL 360.

G. Fittings for Metal Conduit: Comply with NEMA FB 1 and UL 514B.
1. Fittings for EMT:

a. Material: Steel.
b. Type: Setscrew.

2. Expansion Fittings: PVC or steel to match conduit type, complying with UL 651, rated for environmental conditions where installed, and including flexible external bonding jumper.

H. Joint Compound for GRC: Approved, as defined in NFPA 70, by authorities having jurisdiction for use in conduit assemblies, and compounded for use to lubricate and protect threaded conduit joints from corrosion and to enhance their conductivity.

2.2 NONMETALLIC CONDUITS, TUBING, AND FITTINGS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

1. AFC Cable Systems, Inc.
2. Electri-Flex Company.
3. RACO; Hubbell.
4. Thomas & Betts Corporation.

B. Listing and Labeling: Nonmetallic conduits, tubing, and fittings shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

C. RNC: Type EPC-40-PVC, complying with NEMA TC 2 and UL 651 unless otherwise indicated.

D. LFNC: Comply with UL 1660.

E. Rigid HDPE: Comply with UL 651A.

F. RTRC: Comply with UL 1684A and NEMA TC 14.

G. Fittings for ENT and RNC: Comply with NEMA TC 3; match to conduit or tubing type and material.

H. Fittings for LFNC: Comply with UL 514B.

I. Solvent cements and adhesive primers shall have a VOC content of 510 and 550 g/L or less, respectively, when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

2.3 BOXES, ENCLOSURES, AND CABINETS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

1. EGS/Appleton Electric.
2. Erickson Electrical Equipment Company.
3. Hoffman; a brand of Pentair Equipment Protection.
4. Hubbell Incorporated.
5. O-Z/Gedney; an EGS Electrical Group brand; an Emerson Industrial Automation business.
6. RACO; Hubbell.

B. General Requirements for Boxes, Enclosures, and Cabinets: Boxes, enclosures, and cabinets installed in wet locations shall be listed for use in wet locations.

C. Sheet Metal Outlet and Device Boxes: Comply with NEMA OS 1 and UL 514A.

D. Cast-Metal Outlet and Device Boxes: Comply with NEMA FB 1, ferrous alloy, Type FD, with gasketed cover.

E. Nonmetallic Outlet and Device Boxes: Comply with NEMA OS 2 and UL 514C.

F. Small Sheet Metal Pull and Junction Boxes: NEMA OS 1.

G. Cast-Metal Access, Pull, and Junction Boxes: Comply with NEMA FB 1 and UL 1773, galvanized, cast iron with gasketed cover.

H. Box extensions used to accommodate new building finishes shall be of same material as recessed box.

I. Device Box Dimensions: 4 inches square by 2-1/8 inches deep.

J. Gangable boxes are allowed.

K. Hinged-Cover Enclosures: Comply with UL 50 and NEMA 250, Type 3R with continuous-hinge cover with flush latch unless otherwise indicated.

1. Metal Enclosures: Steel, finished inside and out with manufacturer's standard enamel.
2. Nonmetallic Enclosures: Fiberglass.
3. Interior Panels: Steel; all sides finished with manufacturer's standard enamel.

L. Cabinets:

1. NEMA 250, Type 3R galvanized-steel box with removable interior panel and removable front, finished inside and out with manufacturer's standard enamel.
2. Hinged door in front cover with flush latch and concealed hinge.
3. Key latch to match panelboards.
4. Metal barriers to separate wiring of different systems and voltage.
5. Accessory feet where required for freestanding equipment.
6. Nonmetallic cabinets shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

2.4 HANDHOLES AND BOXES FOR EXTERIOR UNDERGROUND WIRING

A. General Requirements for Handholes and Boxes:

1. Boxes and handholes for use in underground systems shall be designed and identified as defined in NFPA 70, for intended location and application.
2. Boxes installed in wet areas shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. Polymer-Concrete Handholes and Boxes with Polymer-Concrete Cover: Molded of sand and aggregate, bound together with polymer resin, and reinforced with steel, fiberglass, or a combination of the two.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

   a. Armorcast Products Company.
   b. Carson Industries LLC.
   c. Quazite: Hubbell Power Systems, Inc.

2. Standard: Comply with SCTE 77.
3. Configuration: Designed for flush burial with open bottom unless otherwise indicated.
4. Cover: Weatherproof, secured by tamper-resistant locking devices and having structural load rating consistent with enclosure and handhole location.
5. Cover Finish: Nonskid finish shall have a minimum coefficient of friction of 0.50.
6. Cover Legend: Molded lettering, "ELECTRIC.".

7. Conduit Entrance Provisions: Conduit-terminating fittings shall mate with entering ducts for secure, fixed installation in enclosure wall.
8. Handholes 12 Inches Wide by 24 Inches Long and Larger: Have inserts for cable racks and pulling-in irons installed before concrete is poured.

PART 3 - EXECUTION

3.1 RACEWAY APPLICATION

A. Outdoors: Apply raceway products as specified below unless otherwise indicated:

1. Exposed Conduit: GRC.
2. Concealed Conduit, Aboveground: GRC.
3. Underground Conduit: RNC, Type EPC-40-PVC, direct buried.
4. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): LFMC.
5. Boxes and Enclosures, Aboveground: NEMA 250, Type 3R.

B. Indoors: Apply raceway products as specified below unless otherwise indicated:

1. Exposed, Not Subject to Physical Damage: EMT.
2. Exposed, Not Subject to Severe Physical Damage: EMT.
3. Exposed and Subject to Severe Physical Damage: GRC. Raceway locations include the following:
   a. Mechanical rooms.

4. Concealed in Ceilings and Interior Walls and Partitions: EMT.
5. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): FMC, except use LFMC in damp or wet locations.
6. Damp or Wet Locations: GRC.

C. Minimum Raceway Size: 3/4-inch trade size.

D. Raceway Fittings: Compatible with raceways and suitable for use and location.

1. Rigid Steel Conduit: Use threaded rigid steel conduit fittings unless otherwise indicated. Comply with NEMA FB 2.10.
2. EMT: Use setscrew steel fittings. Comply with NEMA FB 2.10.
3. Flexible Conduit: Use only fittings listed for use with flexible conduit. Comply with NEMA FB 2.20.

E. Install surface raceways only where indicated on Drawings.

F. Do not install nonmetallic conduit where ambient temperature exceeds 120 deg F.

3.2 INSTALLATION

A. Keep raceways at least 6 inches away from parallel runs of flues and steam or hot-water pipes. Install horizontal raceway runs above water and steam piping.

B. Complete raceway installation before starting conductor installation.

C. Arrange stub-ups so curved portions of bends are not visible above finished slab.

D. Install no more than the equivalent of three 90-degree bends in any conduit run except for control wiring conduits, for which fewer bends are allowed. Support within 12 inches of changes in direction.

E. Conceal conduit and EMT within finished walls, ceilings, and floors unless otherwise indicated. Install conduits parallel or perpendicular to building lines.

F. All conduit to be installed on exterior masonry shall not run continuously within the wall cavity.

G. Support conduit within 12 inches of enclosures to which attached.

H. Raceways Embedded in Slabs:

1. Are not permitted, except as required for entry into recessed floor boxes.
2. Conduits run below slab on ground floor level shall be buried within the porous fill and stub-up at the required location. Transition from RNC to RGS with RGS elbow before rising above the floor. After RGS elbow, stub-up conduit shall be type indicated in Part 3.1 above.
3. Where raceways are terminated with threaded hubs, screw raceways or fittings tightly into hub so end bears against wire protection shoulder. Where chase nipples are used, align raceways so coupling is square to box; tighten chase nipple so no threads are exposed.
4. Do not embed threadless fittings in concrete unless specifically approved by Architect for each specific location.
5. Change from ENT to GRC before rising above floor.

I. Stub-ups to Above Recessed Ceilings:

1. Use EMT, IMC, or RMC for raceways.
2. Use a conduit bushing or insulated fitting to terminate stub-ups not terminated in hubs or in an enclosure.

J. Threaded Conduit Joints, Exposed to Wet, Damp, Corrosive, or Outdoor Conditions: Apply listed compound to threads of raceway and fittings before making up joints. Follow compound manufacturer's written instructions.

K. Raceway Terminations at Locations Subject to Moisture or Vibration: Use insulating bushings to protect conductors including conductors smaller than No. 4 AWG.

L. Terminate threaded conduits into threaded hubs or with locknuts on inside and outside of boxes or cabinets. Install bushings on conduits up to 1-1/4-inch trade size and insulated throat metal bushings on 1-1/2-inch trade size and larger conduits terminated with locknuts. Install insulated throat metal grounding bushings on service conduits.

M. Install raceways square to the enclosure and terminate at enclosures with locknuts. Install locknuts hand tight plus 1/4 turn more.

N. Do not rely on locknuts to penetrate nonconductive coatings on enclosures. Remove coatings in the locknut area prior to assembling conduit to enclosure to assure a continuous ground path.

O. Cut conduit perpendicular to the length. For conduits 2-inch trade size and larger, use roll cutter or a guide to make cut straight and perpendicular to the length.

P. Install pull wires in empty raceways. Use polypropylene or monofilament plastic line with not less than 200-lb tensile strength. Leave at least 12 inches of slack at each end of pull wire. Cap underground raceways designated as spare above grade alongside raceways in use.

Q. Install raceway sealing fittings at accessible locations according to NFPA 70 and fill them with listed sealing compound. For concealed raceways, install each fitting in a flush steel box with a blank cover plate having a finish similar to that of adjacent plates or surfaces. Install raceway sealing fittings according to NFPA 70.

R. Install devices to seal raceway interiors at accessible locations. Locate seals so no fittings or boxes are between the seal and the following changes of environments. Seal the interior of all raceways at the following points:

1. Where conduits pass from warm to cold locations, such as boundaries of refrigerated spaces.
2. Where an underground service raceway enters a building or structure.
3. Where otherwise required by NFPA 70.

S. Comply with manufacturer's written instructions for solvent welding RNC and fittings.

T. Expansion-Joint Fittings:

1. Install in each run of aboveground RNC that is located where environmental temperature change may exceed 30 deg F and that has straight-run length that exceeds 25 feet. Install in each run of aboveground RMC and EMT conduit that is located where environmental temperature change may exceed 100 deg F and that has straight-run length that exceeds 100 feet.
2. Install type and quantity of fittings that accommodate temperature change listed for each of the following locations:

   a. Outdoor Locations Not Exposed to Direct Sunlight: 125 deg F temperature change.
   b. Outdoor Locations Exposed to Direct Sunlight: 155 deg F temperature change.

c. Indoor Spaces Connected with Outdoors without Physical Separation: 125 deg F temperature change.
d. Attics: 135 deg F temperature change.

3. Install fitting(s) that provide expansion and contraction for at least 0.00041 inch per foot of length of straight run per deg F of temperature change for PVC conduits. Install fitting(s) that provide expansion and contraction for at least 0.000078 inch per foot of length of straight run per deg F of temperature change for metal conduits.
4. Install expansion fittings at all locations where conduits cross building or structure expansion joints.
5. Install each expansion-joint fitting with position, mounting, and piston setting selected according to manufacturer's written instructions for conditions at specific location at time of installation. Install conduit supports to allow for expansion movement.

U. Flexible Conduit Connections: Comply with NEMA RV 3. Use a maximum of 72 inches of flexible conduit for recessed and semi-recessed luminaires, equipment subject to vibration, noise transmission, or movement; and for transformers and motors.

1. Use LFMC in damp or wet locations subject to severe physical damage.
2. Use LFMC or LFNC in damp or wet locations not subject to severe physical damage.

V. Mount boxes at heights indicated on Drawings. If mounting heights of boxes are not individually indicated, give priority to ADA requirements and also refer to Architectural elevations. Install boxes with height measured to center of box unless otherwise indicated.

W. Horizontally separate boxes mounted on opposite sides of walls so they are not in the same vertical channel.

X. Locate boxes so that cover or plate will not span different building finishes.

Y. Support boxes of three gangs or more from more than one side by spanning two framing members or mounting on brackets specifically designed for the purpose.

Z. Fasten junction and pull boxes to or support from building structure. Do not support boxes by conduits.

3.3 INSTALLATION OF UNDERGROUND HANDHOLES AND BOXES

A. Install handholes and boxes level and plumb and with orientation and depth coordinated with connecting conduits to minimize bends and deflections required for proper entrances.

B. Unless otherwise indicated, support units on a level bed of crushed stone or gravel, graded from 1/2-inch sieve to No. 4 sieve and compacted to same density as adjacent undisturbed earth.

C. Elevation: In paved areas, set so cover surface will be flush with finished grade. Set covers of other enclosures 1 inch above finished grade.

D. Install handholes with bottom below frost line, below grade.

E. Install removable hardware, including pulling eyes, cable stanchions, cable arms, and insulators, as required for installation and support of cables and conductors and as indicated. Select arm lengths to be long enough to provide spare space for future cables but short enough to preserve adequate working clearances in enclosure.

F. Field-cut openings for conduits according to enclosure manufacturer's written instructions. Cut wall of enclosure with a tool designed for material to be cut. Size holes for terminating fittings to be used, and seal around penetrations after fittings are installed.

3.4 SLEEVE AND SLEEVE-SEAL INSTALLATION FOR ELECTRICAL PENETRATIONS

A. Install sleeves and sleeve seals at penetrations of exterior floor and wall assemblies.

3.5 PROTECTION

A. Protect coatings, finishes, and cabinets from damage and deterioration.

1. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.
2. Repair damage to PVC coatings or paint finishes with matching touchup coating recommended by manufacturer.

END OF SECTION 260533

SECTION 260543 - UNDERGROUND DUCTS AND RACEWAYS FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract.

1.2 SUMMARY

A. Section Includes:

1. Direct-buried conduit, ducts, and duct accessories.

1.3 DEFINITIONS

A. Trafficways: Locations where vehicular or pedestrian traffic is a normal course of events.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include ductbank materials, including separators and miscellaneous components.
2. Include ducts and conduits and their accessories, including elbows, end bells, bends, fittings, and solvent cement.
3. Include warning tape.

1.5 INFORMATIONAL SUBMITTALS

A. Ductbank Coordination Drawings: Show duct profiles and coordination with other utilities and underground structures.

1. Include plans and sections, drawn to scale, and show bends and locations of expansion fittings.

B. Source quality-control reports.

C. Field quality-control reports.

1.6 FIELD CONDITIONS

A. Ground Water: Assume ground-water level is at grade level unless a lower water table is noted on Drawings.

PART 2 - PRODUCTS

2.1 GENERAL REQUIREMENTS FOR DUCTS AND RACEWAYS

A. Comply with ANSI C2.

B. Install underground conduits and ductbanks per the table below. Locate a minimum of 3 feet from other utility systems (steam, chilled water, sewer, storm, etc.).

2.2 CONDUIT

A. Rigid Steel Conduit: Galvanized. Comply with ANSI C80.1.

B. RNC: NEMA TC 2, Type EPC-40-PVC and Type EPC-80-PVC, UL 651, with matching fittings by same manufacturer as the conduit, complying with NEMA TC 3 and UL 514B.

2.3 NONMETALLIC DUCTS AND DUCT ACCESSORIES

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

1. ARNCO Corp.
2. Electri-Flex Company.
3. Lamson & Sessions.
4. Spiraduct/AFC Cable Systems, Inc.

B. Underground Plastic Utilities Duct: NEMA TC 2, UL 651, ASTM F 512, Type EPC-80 and Type EPC-40, with matching fittings complying with NEMA TC 3 by same manufacturer as the duct.

C. Duct Accessories:
1. Warning Tape: Underground-line warning tape specified in Section 260553 "Identification for Electrical Systems."

PART 3 - EXECUTION

3.1 PREPARATION

A. Coordinate layout and installation of conduit and boxes with final arrangement of other utilities, site grading, and surface features as determined in the field. Notify Architect if there is a conflict between areas of excavation and existing structures or archaeological sites to remain.

B. Coordinate elevations of conduit and boxes with final locations and profiles of ducts and duct banks, as determined by coordination with other utilities, underground obstructions, and surface features. Revise locations and elevations as required to suit field conditions and as approved by Architect.

C. Clear and grub vegetation to be removed, and protect vegetation.

3.2 UNDERGROUND DUCT APPLICATION

A. Ducts for Electrical Branch Circuits: RNC, NEMA Type EPC-80 or Type EPC-40-PVC, in direct-buried duct bank unless otherwise indicated.

3.3 EARTHWORK

A. Excavation and Backfill: do not use heavy-duty, hydraulic-operated, compaction equipment.

B. Restore surface features at areas disturbed by excavation, and re-establish original grades unless otherwise indicated. Replace removed sod immediately after backfilling is completed.

C. Restore areas disturbed by trenching, storing of dirt, cable laying, and other work. Restore vegetation and include necessary topsoiling, fertilizing, liming, seeding, sodding, sprigging, and mulching. Comply with Section 329220 "Seeding & Sodding" and Section 329000 "Planting."

D. Cut and patch existing pavement in the path of underground ducts and utility structures.

3.4 DUCT INSTALLATION

A. Install ducts according to NEMA TCB 2.

B. Slope: Pitch ducts a minimum slope of 1:300 down toward manholes and handholes and away from buildings and equipment. Slope ducts from a high point in runs between two manholes, to drain in both directions.

C. Curves and Bends: Use 5-degree angle couplings for small changes in direction. Use manufactured long sweep bends with a minimum radius of 48 inches, both horizontally and vertically, at other locations unless otherwise indicated.

D. Joints: Use solvent-cemented joints in ducts and fittings and make watertight according to manufacturer's written instructions. Stagger couplings so those of adjacent ducts do not lie in same plane.

E. Installation Adjacent to High-Temperature Steam Lines: Where duct banks are installed parallel to underground steam lines, perform calculations showing the duct bank will not be subject to environmental temperatures above 40 deg C. Where environmental temperatures are calculated to rise above 40 deg C, and anywhere the duct bank crosses above an underground steam line, install insulation blankets listed for direct burial to isolate the duct bank from the steam line.

F. Building Wall Penetrations: Make a transition from underground duct to rigid steel conduit at least 10 feet outside the building wall, without reducing duct line slope away from the building, and without forming a trap in the line. Use fittings manufactured for duct-to-conduit transition. Install conduit penetrations of building walls as specified.

G. Sealing: Provide temporary closure at terminations of ducts that have cables pulled. Seal spare ducts at terminations. Use sealing compound and plugs to withstand at least 15-psig hydrostatic pressure.

H. Pulling Cord: Install 100-lbf- test nylon cord in empty ducts.

I. Direct-Buried Duct Banks:

1. Excavate trench bottom to provide firm and uniform support for duct bank.
2. Support ducts on duct separators coordinated with duct size, duct spacing, and outdoor temperature.
3. Depth: Install top of duct bank at least 36 inches below finished grade unless otherwise indicated.
4. Set elevation of bottom of duct bank below frost line.
5. Install ducts with a minimum of 3 inches between ducts for like services and 6 inches between power and signal ducts.
6. Elbows: Install manufactured duct elbows for stub-ups at poles and equipment, at building entrances through floor, and at changes of direction in duct run unless otherwise indicated. Encase elbows for stub-up ducts throughout length of elbow.
7. Install manufactured rigid steel conduit elbows for stub-ups at poles and equipment, at building entrances through floor, and at changes of direction in duct run.

    a. Couple steel conduits to ducts with adapters designed for this purpose, and encase coupling with 3 inches of concrete.
    b. For equipment mounted on outdoor concrete bases, extend steel conduit horizontally a minimum of 60 inches from edge of equipment pad or foundation. Install insulated grounding bushings on terminations at equipment.

8. After installing first tier of ducts, backfill and compact. Start at tie-in point and work toward end of duct run, leaving ducts at end of run free to move with expansion and contraction as temperature changes during this process. Repeat procedure after placing each tier. After placing last tier, hand place backfill to 4 inches over ducts and hand tamp. Firmly tamp backfill around ducts to provide maximum supporting strength. Use hand

tamper only. After placing controlled backfill over final tier, make final duct connections at end of run and complete backfilling with normal compaction.

a. Place minimum 3 inches of sand as a bed for duct bank. Place sand to a minimum of 6 inches above top level of duct bank.
b. Place minimum 6 inches of engineered fill above concrete encasement of duct bank.

J. Warning Tape: Bury warning tape approximately 12 inches above all concrete-encased ducts and duct banks. Align tape parallel to and within 3 inches of centerline of duct bank. Provide an additional warning tape for each 12-inch increment of duct-bank width over a nominal 18 inches. Space additional tapes 12 inches apart, horizontally.

3.5 GROUNDING

A. Ground underground ducts and utility structures according to Section 260526 "Grounding and Bonding for Electrical Systems."

3.6 FIELD QUALITY CONTROL

A. Perform the following tests and inspections and prepare test reports:

1. Demonstrate capability and compliance with requirements on completion of installation of underground ducts and utility structures.
2. Pull solid aluminum or wood test mandrel through duct to prove joint integrity and adequate bend radii, and test for out-of-round duct. Provide a minimum 6-inch- long mandrel equal to 80 percent fill of duct. If obstructions are indicated, remove obstructions and retest.

B. Correct deficiencies and retest as specified above to demonstrate compliance.

3.7 CLEANING

A. Pull leather-washer-type duct cleaner, with graduated washer sizes, through full length of ducts. Follow with rubber duct swab for final cleaning and to assist in spreading lubricant throughout ducts.

B. Clean internal surfaces of manholes, including sump. Remove foreign material.

END OF SECTION 260543

SECTION 260553 - IDENTIFICATION FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract.

1.2 SUMMARY

A. Section Includes:

1. Identification for raceways.
2. Identification of power and control cables.
3. Identification for conductors.
4. Underground-line warning tape.
5. Warning labels and signs.
6. Equipment identification labels.
7. Miscellaneous identification products.

1.3 ACTION SUBMITTALS

A. Product Data: For each electrical identification product indicated.

1.4 QUALITY ASSURANCE

A. Comply with ANSI A13.1 and IEEE C2.

B. Comply with NFPA 70.

C. Comply with 29 CFR 1910.144 and 29 CFR 1910.145.

D. Comply with ANSI Z535.4 for safety signs and labels.

E. Adhesive-attached labeling materials, including label stocks, laminating adhesives, and inks used by label printers, shall comply with UL 969.

1.5 COORDINATION

A. Coordinate identification names, abbreviations, colors, and other features with requirements in other Sections requiring identification applications, Drawings, Shop Drawings, manufacturer's

wiring diagrams, and the Operation and Maintenance Manual; and with those required by codes, standards, and 29 CFR 1910.145. Use consistent designations throughout Project.

B. Coordinate installation of identifying devices with completion of covering and painting of surfaces where devices are to be applied.

C. Install identifying devices before installing acoustical ceilings and similar concealment.

PART 2 - PRODUCTS

2.1 POWER AND CONTROL RACEWAY IDENTIFICATION MATERIALS

A. Comply with ANSI A13.1 for minimum size of letters for legend and for minimum length of color field for each raceway size.

B. Colors for Raceways Carrying Circuits at 600 V or Less:

1. Black letters on an orange field.
2. Legend: Indicate voltage and system or service type.

C. Vinyl Labels for Raceways Carrying Circuits at 600 V or Less: Preprinted, flexible label laminated with a clear, weather- and chemical-resistant coating and matching wraparound clear adhesive tape for securing ends of legend label.

2.2 POWER AND CONTROL CABLE IDENTIFICATION MATERIALS

A. Comply with ANSI A13.1 for minimum size of letters for legend and for minimum length of color field for each cable size.

B. Vinyl Labels: Preprinted, flexible label laminated with a clear, weather- and chemical-resistant coating and matching wraparound clear adhesive tape for securing ends of legend label.

2.3 CONDUCTOR IDENTIFICATION MATERIALS

A. Color-Coding Conductor Tape: Colored, self-adhesive vinyl tape not less than 3 mils thick by 1 to 2 inches wide.

2.4 UNDERGROUND-LINE WARNING TAPE

A. Tape:

1. Recommended by manufacturer for the method of installation and suitable to identify and locate underground electrical and communications utility lines.
2. Printing on tape shall be permanent and shall not be damaged by burial operations.

3. Tape material and ink shall be chemically inert, and not subject to degrading when exposed to acids, alkalis, and other destructive substances commonly found in soils.

B. Color and Printing:

1. Comply with ANSI Z535.1 through ANSI Z535.5.
2. Inscriptions for Red-Colored Tapes: ELECTRIC LINE, HIGH VOLTAGE,.

C. Warning Tape:

1. Detectable three-layer laminate, consisting of a printed pigmented polyolefin film, a solid aluminum-foil core, and a clear protective film that allows inspection of the continuity of the conductive core, bright-colored, continuous-printed on one side with the inscription of the utility, compounded for direct-burial service.
2. Overall Thickness: 5 mils.
3. Foil Core Thickness: 0.35 mil.
4. Weight: 28 lb/1000 sq. ft..
5. 3-Inch Tensile According to ASTM D 882: 70 lbf, and 4600 psi.

2.5 WARNING LABELS AND SIGNS

A. Comply with NFPA 70 and 29 CFR 1910.145.

B. Self-Adhesive Warning Labels: Factory-printed, multicolor, pressure-sensitive adhesive labels, configured for display on front cover, door, or other access to equipment unless otherwise indicated.

2.6 EQUIPMENT IDENTIFICATION LABELS

A. Engraved, Laminated Acrylic or Melamine Label: Punched or drilled for screw mounting. White letters on a dark-gray background. Minimum letter height shall be 3/8 inch.

2.7 CABLE TIES

A. General-Purpose Cable Ties: Fungus inert, self extinguishing, one piece, self locking, Type 6/6 nylon.

1. Minimum Width: 3/16 inch.
2. Tensile Strength at 73 deg F, According to ASTM D 638: 12,000 psi.
3. Temperature Range: Minus 40 to plus 185 deg F.
4. Color: Black except where used for color-coding.

2.8 MISCELLANEOUS IDENTIFICATION PRODUCTS

A. Paint: Comply with requirements in painting Sections for paint materials and application requirements. Select paint system applicable for surface material and location (exterior or interior).

B. Fasteners for Labels and Signs: Self-tapping, stainless-steel screws or stainless-steel machine screws with nuts and flat and lock washers.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Verify identity of each item before installing identification products.

B. Location: Install identification materials and devices at locations for most convenient viewing without interference with operation and maintenance of equipment.

C. Apply identification devices to surfaces that require finish after completing finish work.

D. Self-Adhesive Identification Products: Clean surfaces before application, using materials and methods recommended by manufacturer of identification device.

E. Attach signs and plastic labels that are not self-adhesive type with mechanical fasteners appropriate to the location and substrate.

F. System Identification Color-Coding Bands for Raceways and Cables: Each color-coding band shall completely encircle cable or conduit. Place adjacent bands of two-color markings in contact, side by side. Locate bands at changes in direction, at penetrations of walls and floors, at 50-foot maximum intervals in straight runs, and at 25-foot maximum intervals in congested areas.

G. Cable Ties: For attaching tags. Use general-purpose type, except as listed below:

1. Outdoors: UV-stabilized nylon.
2. In Spaces Handling Environmental Air: Plenum rated.

H. Underground-Line Warning Tape: During backfilling of trenches install continuous underground-line warning tape directly above line at 6 to 8 inches below finished grade. Use multiple tapes where width of multiple lines installed in a common trench or concrete envelope exceeds 16 inches overall.

I. Painted Identification: Comply with requirements in painting Sections for surface preparation and paint application.

3.2 IDENTIFICATION SCHEDULE

A. Accessible Raceways, 600 V or Less, for Service, Feeder, and Branch Circuits More Than 30 A, and 120 V to ground: Identify with self-adhesive vinyl label. Install labels at 10-foot maximum intervals.

B. Power-Circuit Conductor Identification, 600 V or Less: For conductors in pull and junction boxes and handholes, use color-coding conductor tape to identify the phase.

1. Color-Coding for Phase and Voltage Level Identification, 600 V or Less: Use colors listed below for ungrounded service feeder and branch-circuit conductors.

a. Color shall be factory applied or field applied for sizes larger than No. 8 AWG, if authorities having jurisdiction permit.

b. Colors for 480/277-V Circuits:

1) Phase A: Brown.
2) Phase B: Orange.
3) Phase C: Yellow.
4) Grounded (Neutral): Gray.
5) Ground: Green.

c. Field-Applied, Color-Coding Conductor Tape: Apply in half-lapped turns for a minimum distance of 6 inches from terminal points and in boxes where splices or taps are made. Apply last two turns of tape with no tension to prevent possible unwinding. Locate bands to avoid obscuring factory cable markings.

C. Install instructional sign including the color-code for grounded and ungrounded conductors using adhesive-film-type labels.

D. Control-Circuit Conductor Identification: For conductors and cables in pull and junction boxes, manholes, and handholes, use self-adhesive, self-laminating polyester labels with the conductor or cable designation, origin, and destination.

E. Control-Circuit Conductor Termination Identification: For identification at terminations provide heat-shrink preprinted tubes or self-adhesive, self-laminating polyester labels with the conductor designation.

F. Conductors to Be Extended in the Future: Attach marker tape to conductors and list source.

G. Auxiliary Electrical Systems Conductor Identification: Identify field-installed alarm, control, and signal connections.

1. Identify conductors, cables, and terminals in enclosures and at junctions, terminals, and pull points. Identify by system and circuit designation.
2. Use system of marker tape designations that is uniform and consistent with system used by manufacturer for factory-installed connections.

3. Coordinate identification with Project Drawings, manufacturer's wiring diagrams, and the Operation and Maintenance Manual.

H. Locations of Underground Lines: Identify with underground-line warning tape for power, lighting, communication, and control wiring and optical fiber cable.

1. Limit use of underground-line warning tape to direct-buried cables.
2. Install underground-line warning tape for both direct-buried cables and cables in raceway.

I. Equipment Identification Labels: On each unit of equipment, install unique designation label that is consistent with wiring diagrams, schedules, and the Operation and Maintenance Manual. Apply labels to disconnect switches and protection equipment, central or master units, control panels, control stations, terminal cabinets, and racks of each system. Systems include power, lighting, control, communication, signal, monitoring, and alarm systems unless equipment is provided with its own identification.

1. Labeling Instructions:

a. Indoor Equipment: Adhesive film label with clear protective overlay. Unless otherwise indicated, provide a single line of text with 1/2-inch- high letters on 1-1/2-inch- high label; where two lines of text are required, use labels 2 inches high.
b. Outdoor Equipment: Engraved, laminated acrylic or melamine label.
c. Elevated Components: Increase sizes of labels and letters to those appropriate for viewing from the floor.
d. Unless provided with self-adhesive means of attachment, fasten labels with appropriate mechanical fasteners that do not change the NEMA or NRTL rating of the enclosure.

2. Equipment to Be Labeled:

a. Panelboards: Typewritten directory of circuits in the location provided by panelboard manufacturer. Panelboard identification shall be, laminated acrylic or melamine label.
b. Enclosures and electrical cabinets.
c. Contactors.

END OF SECTION 260553

SECTION 265600 - EXTERIOR LIGHTING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract.

1.2 SUMMARY

A. Section Includes:

1. Exterior luminaires with LED’s and drivers.
2. Poles and accessories.
3. Luminaire lowering devices.

1.3 DEFINITIONS

A. CCT: Correlated color temperature.

B. CRI: Color-rendering index.

C. LER: Luminaire efficacy rating.

D. Luminaire: Complete lighting fixture.

E. Pole: Luminaire support structure, including tower used for large area illumination.

F. Standard: Same definition as "Pole" above.

1.4 STRUCTURAL ANALYSIS CRITERIA FOR POLE SELECTION

A. Dead Load: Weight of luminaire and its horizontal and vertical supports, lowering devices, and supporting structure, applied as stated in AASHTO LTS-4-M.

B. Live Load: Single load of 500 lbf, distributed as stated in AASHTO LTS-4-M.

C. Ice Load: Load of 3 lbf/sq. ft., applied as stated in AASHTO LTS-4-M Ice Load Map.

D. Wind Load: Pressure of wind on pole and luminaire and banners and banner arms, calculated and applied as stated in AASHTO LTS-4-M.

1.5 ACTION SUBMITTALS

A. Product Data: For each luminaire, pole, and support component, arranged in order of lighting unit designation. Include data on features, accessories, finishes, and the following:

1. Physical description of luminaire, including materials, dimensions, effective projected area, and verification of indicated parameters.
2. Details of attaching luminaires and accessories.
3. Details of installation and construction.
4. Luminaire materials.
5. Photometric data based on laboratory tests of each luminaire type, complete with indicated lamps, ballasts, and accessories.
   a. Manufacturer Certified Data: Photometric data shall be certified by manufacturer's laboratory with a current accreditation under the National Voluntary Laboratory Accreditation Program for Energy Efficient Lighting Products.
6. Drivers, including energy-efficiency data.
7. LED’s, including life, output, CCT, CRI, lumens, and energy-efficiency data.
8. Materials, dimensions, and finishes of poles.
9. Means of attaching luminaires to supports, and indication that attachment is suitable for components involved.
10. Anchor bolts for poles.

B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.

1. Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
2. Anchor-bolt templates keyed to specific poles and certified by manufacturer.
3. Design calculations, certified by a qualified professional engineer, indicating strength of screw foundations and soil conditions on which they are based.
4. Wiring Diagrams: For power, signal, and control wiring.

1.6 INFORMATIONAL SUBMITTALS

A. Pole and Support Component Certificates: Signed by manufacturers of poles, certifying that products are designed for indicated load requirements in AASHTO LTS-4-M and that load imposed by luminaire and attachments has been included in design. The certification shall be based on design calculations by a professional engineer.

B. Qualification Data: For qualified agencies providing photometric data for lighting fixtures.

C. Field quality-control reports.

D. Warranty: Sample of special warranty.

1.7 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For luminaires and poles to include in operation, and maintenance manuals.

1.8 QUALITY ASSURANCE

A. Luminaire Photometric Data Testing Laboratory Qualifications: Provided by manufacturers' laboratories that are accredited under the National Volunteer Laboratory Accreditation Program for Energy Efficient Lighting Products.

B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

C. Comply with IEEE C2, "National Electrical Safety Code."

D. Comply with NFPA 70.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Store poles on decay-resistant-treated skids at least 12 inches above grade and vegetation. Support poles to prevent distortion and arrange to provide free air circulation.

B. Retain factory-applied pole wrappings on metal poles until right before pole installation. For poles with nonmetallic finishes, handle with web fabric straps.

1.10 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace products that fail in materials or workmanship; that corrode; or that fade, stain, perforate, erode, or chalk due to effects of weather or solar radiation within specified warranty period. Manufacturer may exclude lightning damage, hail damage, vandalism, abuse, or unauthorized repairs or alterations from special warranty coverage.

1. Warranty Period for Luminaires: Five years from date of Substantial Completion.
2. Warranty Period for Metal Corrosion: Five years from date of Substantial Completion.
3. Warranty Period for Color Retention: Five years from date of Substantial Completion.
4. Warranty Period for Poles: Repair or replace lighting poles and standards that fail in finish, materials, and workmanship within manufacturer's standard warranty period, but not less than five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Products: Subject to compliance with requirements, provide product indicated in the fixture schedule on the drawings.

2.2 GENERAL REQUIREMENTS FOR LUMINAIRES

A. Luminaires shall comply with UL 1598 and be listed and labeled for installation in wet locations by an NRTL acceptable to authorities having jurisdiction.

B. Lateral Light Distribution Patterns: Comply with IESNA RP-8 for parameters of lateral light distribution patterns indicated for luminaires.

C. Metal Parts: Free of burrs and sharp corners and edges.

D. Sheet Metal Components: Corrosion-resistant aluminum unless otherwise indicated. Form and support to prevent warping and sagging.

E. Housings: Rigidly formed, weather- and light-tight enclosures that will not warp, sag, or deform in use. Provide filter/breather for enclosed luminaires.

F. Doors, Frames, and Other Internal Access: Smooth operating, free of light leakage under operating conditions, and designed to permit relamping without use of tools. Designed to prevent doors, frames, lenses, diffusers, and other components from falling accidentally during relamping and when secured in operating position. Doors shall be removable for cleaning or replacing lenses. Designed to disconnect ballast when door opens.

G. Exposed Hardware Material: Stainless steel.

H. Plastic Parts: High resistance to yellowing and other changes due to aging, exposure to heat, and UV radiation.

I. Light Shields: Metal baffles, factory installed and field adjustable, arranged to block light distribution to indicated portion of normally illuminated area or field.

J. Reflecting surfaces shall have minimum reflectance as follows unless otherwise indicated:

1. White Surfaces: 85 percent.
2. Specular Surfaces: 83 percent.
3. Diffusing Specular Surfaces: 75 percent.

K. Lenses and Refractors Gaskets: Use heat- and aging-resistant resilient gaskets to seal and cushion lenses and refractors in luminaire doors.

L. Luminaire Finish: Manufacturer's standard paint applied to factory-assembled and -tested luminaire before shipping. Where indicated, match finish process and color of pole or support materials.

M. Factory-Applied Finish for Steel Luminaires: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

1. Surface Preparation: Clean surfaces to comply with SSPC-SP 1, "Solvent Cleaning," to remove dirt, oil, grease, and other contaminants that could impair paint bond. Grind welds and polish surfaces to a smooth, even finish. Remove mill scale and rust, if present, from uncoated steel, complying with SSPC-SP 5/NACE No. 1, "White Metal Blast Cleaning," or SSPC-SP 8, "Pickling."
2. Exterior Surfaces: Manufacturer's standard finish consisting of one or more coats of primer and two finish coats of high-gloss, high-build polyurethane enamel.

a. Color: As selected from manufacturer's standard catalog of colors.

N. Factory-Applied Finish for Aluminum Luminaires: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

1. Finish designations prefixed by AA comply with the system established by the Aluminum Association for designating aluminum finishes.

O. Factory-Applied Labels: Comply with UL 1598. Include recommended lamps and ballasts. Labels shall be located where they will be readily visible to service personnel, but not seen from normal viewing angles when lamps are in place.

1. Label shall include the following lamp and ballast characteristics:

a. "USES ONLY" and include specific lamp type.
b. CCT and CRI for all luminaires.

2.3 GENERAL REQUIREMENTS FOR POLES AND SUPPORT COMPONENTS

A. Structural Characteristics: Comply with AASHTO LTS-4-M.

1. Wind-Load Strength of Poles: Adequate at indicated heights above grade without failure, permanent deflection, or whipping in steady winds of speed indicated in "Structural Analysis Criteria for Pole Selection" Article.
2. Strength Analysis: For each pole, multiply the actual equivalent projected area of luminaires and brackets by a factor of **1.1** to obtain the equivalent projected area to be used in pole selection strength analysis.

B. Luminaire Attachment Provisions: Comply with luminaire manufacturers' mounting requirements. Use stainless-steel fasteners and mounting bolts unless otherwise indicated.

C. Mountings, Fasteners, and Appurtenances: Corrosion-resistant items compatible with support components.

1. Materials: Shall not cause galvanic action at contact points.
2. Anchor Bolts, Leveling Nuts, Bolt Caps, and Washers: Hot-dip galvanized after fabrication unless otherwise indicated.
3. Anchor-Bolt Template: Plywood or steel.

D. Handhole: Oval-shaped, with minimum clear opening of 2-1/2 by 5 inches, with cover secured by stainless-steel captive screws.

E. Concrete Pole Foundations: Cast in place, with anchor bolts to match pole-base flange.

2.4 STEEL POLES

A. Poles: Comply with ASTM A 500, Grade B, carbon steel with a minimum yield of 46,000 psig; one-piece construction up to 40 feet in height with access handhole in pole wall.

1. Shape: Round, straight.
2. Mounting Provisions: Butt flange for bolted mounting on foundation or breakaway support.

B. Grounding and Bonding Lugs: Welded 1/2-inch threaded lug, complying with requirements in Section 260526 "Grounding and Bonding for Electrical Systems," listed for attaching grounding and bonding conductors of type and size listed in that Section, and accessible through handhole.

C. Cable Support Grip: Wire-mesh type with rotating attachment eye, sized for diameter of cable and rated for a minimum load equal to weight of supported cable times a 5.0 safety factor.

D. Factory-Painted Finish: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

1. Surface Preparation: Clean surfaces to comply with SSPC-SP 1, "Solvent Cleaning," to remove dirt, oil, grease, and other contaminants that could impair paint bond. Grind welds and polish surfaces to a smooth, even finish. Remove mill scale and rust, if present, from uncoated steel, complying with SSPC-SP 5/NACE No. 1, "White Metal Blast Cleaning," or with SSPC-SP 8, "Pickling."
2. Interior Surfaces of Pole: One coat of bituminous paint, or otherwise treat for equal corrosion protection.
3. Exterior Surfaces: Manufacturer's standard finish consisting of one or more coats of primer and two finish coats of high-gloss, high-build polyurethane enamel.

    a. Color: Decorative Dark Bronze.

2.5 POLE ACCESSORIES

A. Base Covers: Manufacturers' standard metal units, arranged to cover pole's mounting bolts and nuts. Finish same as pole.

PART 3 - EXECUTION

3.1 LUMINAIRE INSTALLATION

A. Install LED’s in each luminaire.

B. Fasten luminaire to indicated structural supports.

1. Use fastening methods and materials selected to resist seismic forces defined for the application and approved by manufacturer.

C. Adjust luminaires that require field adjustment or aiming. Include adjustment of photoelectric device to prevent false operation of relay by artificial light sources, favoring a north orientation.

3.2 POLE INSTALLATION

A. Alignment: Align pole foundations and poles for optimum directional alignment of luminaires and their mounting provisions on the pole.

B. Clearances: Maintain the following minimum horizontal distances of poles from surface and underground features unless otherwise indicated on Drawings:

1. Fire Hydrants and Storm Drainage Piping: 60 inches.
2. Water, Gas, Electric, Communication, and Sewer Lines: 10 feet.
3. Trees: 15 feet from tree trunk.

C. Concrete Pole Foundations: Set anchor bolts according to anchor-bolt templates furnished by pole manufacturer.

D. Foundation-Mounted Poles: Mount pole with leveling nuts, and tighten top nuts to torque level recommended by pole manufacturer.

1. Use anchor bolts and nuts selected to resist seismic forces defined for the application and approved by manufacturer.
2. Grout void between pole base and foundation. Use nonshrink or expanding concrete grout firmly packed to fill space.
3. Install base covers unless otherwise indicated.
4. Use a short piece of 1/2-inch- diameter pipe to make a drain hole through grout. Arrange to drain condensation from interior of pole.

3.3 CORROSION PREVENTION

A. Steel Conduits: Comply with Section 260533 "Raceways and Boxes for Electrical Systems." In concrete foundations, wrap conduit with 0.010-inch- thick, pipe-wrapping plastic tape applied with a 50 percent overlap.

3.4 GROUNDING

A. Ground metal poles and support structures according to Section 260526 "Grounding and Bonding for Electrical Systems."
   1. Install grounding conductor pigtail in the base for connecting luminaire to grounding system.

3.5 FIELD QUALITY CONTROL

A. Inspect each installed fixture for damage. Replace damaged fixtures and components.

B. Illumination Observations: Verify normal operation of lighting units after installing luminaires and energizing circuits with normal power source.

   1. Verify operation of photoelectric controls.

C. Illumination Tests:

   1. Measure light intensities at night. Use photometers with calibration referenced to NIST standards. Comply with the following IESNA testing guide(s):

      a. IESNA LM-5, "Photometric Measurements of Area and Sports Lighting Installations."
      b. IESNA LM-50, "Photometric Measurements of Roadway Lighting Installations."
      c. IESNA LM-52, "Photometric Measurements of Roadway Sign Installations."
      d. IESNA LM-64, "Photometric Measurements of Parking Areas."
      e. IESNA LM-72, "Directional Positioning of Photometric Data."

D. Prepare a written report of tests, inspections, observations, and verifications indicating and interpreting results. If adjustments are made to lighting system, retest to demonstrate compliance with standards.

3.6 DEMONSTRATION

A. Train Owner's maintenance personnel to adjust, operate, and maintain of luminaire.

END OF SECTION 265600

SECTION 329000 - PLANTING

PART 1 - GENERAL

1.1 DESCRIPTION

A. This Section specifies requirements for the preparation and planting of trees, shrubs, and other plants in landscaped areas.

B. The work includes:

1. Furnishing and installation of trees, shrubs, and groundcover plants.

2. Soil amendments and backfill soil mix.

3. Maintenance, clean-up, and guarantee.

1.2 RELATED SECTIONS

A. Sections which directly relate to the work of this Section include:

1. Section 329115 - SOIL PREPARATION.

4. Section 329220 - SEEDING AND SODDING.

1.3 SUBMITTALS

A. Manufacturer’s Product Data

1. Submit material manufacturer's literature and installation instructions where applicable attesting that the following materials meet the requirements specified:

a. Soil Amendments
b. Anti-desiccant
c. Mulch
d. Anchors

B. Soil Test Reports

1. Minimum one month prior to ordering, importing, spreading or amending the topsoil, submit soil test report to the Landscape Architect for review and approval. Do not order materials until the Landscape Architect’s approval has been obtained. Delivered materials shall closely match the approved samples.
   a. Refer to Section 329115 SOIL PREPARATION for soil testing requirements.

b. Secondary testing of topsoil samples may be required to verify the amount of soil amendment that will be required in order to bring pH levels, percentage of organic matter, and other levels of nutrients within the recommended range without raising soluble salts and other nutrients and micronutrients to toxic levels. This testing will be done as directed by soil test labs to samples of the topsoil with varying amounts of amendments added to each sample and resubmitted to the soil testing agency. Written report of secondary testing with recommendations shall be submitted prior to amendments being added to the topsoil on site. Landscape Architect is to review and approve recommendations.

C. Certificates & Plant Substitutions

1. Early in the project but not less than one month prior to planting operation, a Certificate of Compliance to the specifications shall be submitted by the nursery grower with each shipment of each type of plant, certifying that plants meet the size, genus, species, and cultivar type specified on the Plant List. Contractors are required to contact nurseries/ growers at the award of the project to review availability, schedule for delivery and reserve plants as needed to verify that quantities, types, and sizes of plants will be available prior to submitting the Certificate of Compliance.

2. All requested plant substitutions are to be made in writing at least one month prior to planting operation and must be accompanied by list of nurseries/growers contacted and dates of contact to prove that reasonable effort was made to obtain the plants as specified. Requests shall list at least five major nursery sources contacted for confirmation of unavailability. If there are field issues or other reason for contractor to recommend a plant substitution an explanation will be made with the request.

3. If plant substitutions have met all above criteria, the request should provide an equivalent obtainable size and variety of plant having the same essential characteristics as specified variety with an equitable adjustment of contract price.

D. Maintenance Manual

1. The Contractor shall submit a written manual prepared specifically for this project to be provided to the Owner that outlines a schedule for proper maintenance of the plantings. This maintenance schedule shall include timing and methods for watering, fertilization, mulching, pruning, and other maintenance operations.

E. Submittal Schedule

1. One month prior to topsoil order, import, respread or amendment provide:

   a. Soil Test Reports.

2. Before installation of amendments and delivery of plants:

   a. Manufacturer's Product Data. See Section 1.07A.
   b. Plant Certification.

3. After installation of amendments and plants and before acceptance:

   a. Maintenance Manual.

1.4 QUALITY ASSURANCE

A. All planting operations shall be performed by a single firm specialized and experienced in landscape work using experienced personnel under competent supervision. Education, experience and certification or license by appropriate organization may be reviewed to evaluate competence. Contractor is to have been in the landscape installation business for a minimum of five years under the same name and is to supply references of similarly sized and same type of projects if requested.

B. The landscape contractor is responsible for coordinating work with the other contractors. The planting plan does not guarantee the existence or non-existence of any utilities. Prior to any construction, excavation or roto-tilling the landscape contractor shall assume the responsibility of verifying the locations of all utilities, above or below ground, public and/or private that may exist and cross through the areas of planting and construction. The Engineer’s cost for inspection trips outside the Commonwealth of Virginia shall be paid by Contractor.

C. Plant Approval: Plants may be inspected and approved by the Owner’s Representative. Plants shall be inspected at the grower's nursery by the landscape contractor and upon delivery at the site for conformity to specification requirements. Approval of plants at the source does not replace additional inspection and rejection at the site, or during the progress of the work. Rejected plants shall be removed immediately from the site. A Contractor's representative shall be present at all inspections. All plants on the Plant List shall be pre-selected by the Contractor to ensure that plants of specified size and species are available at the nursery before the plant selection trip is scheduled.

1.5 TOPSOIL TESTING

A. Refer to Section 329115, Soil Preparation for Soil Testing.

B. Specified soil additive materials and fertilizer types and requirements are to be as recommended in soil test reports and as reviewed and approved by Landscape Architect.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver plant materials to site in healthy and undamaged condition.

B. Move plant material with solid balls wrapped in burlap or synthetic wrapping.

C. Deliver plant materials immediately prior to placement. Keep plant materials moist. As required by temperature or wind conditions, apply anti-desiccant emulsion to prevent drying out of plant materials.

D. Reject plants when ball of earth surrounding roots has been cracked or broken preparatory to, or during, process of planting and when soil covering root stock, graft or on top of root ball would require more than two inches of soil to be removed to expose trunk flare.

E. Reject plants when burlap, staves, and ropes required for transplanting have been displaced prior to acceptance.

F. Reject plans when girdling or defective roots are clearly visible and cannot be pruned or modified without compromising the integrity of the plant.

1.7 GUARANTEE

A. Provide one-year guarantee from date of plant material acceptance.

B. Replace plant materials found dead or not in a healthy growing condition. Plants shall exhibit at least 75% healthy branching and foliage, and shall be free of insect or disease damage. Replace plants during normal planting season.

C. Replacement: Plant materials shall be of same size and species, with a new warranty commencing on date of replacement. The Landscape Architect shall be given a three day notice of installation of replacement plants to allow inspection of plant material.

1.8 INSPECTION FOR ACCEPTANCE

A. After the minimum thirty (30) day maintenance period, the Contractor shall request from the Landscape Architect, in writing, for an inspection to determine whether the plant material is acceptable. If the plant material and workmanship are acceptable, written notice will be given by the Landscape Architect to the Contractor stating that the guarantee period begins from the date of the Certificate of Acceptance.

B. If a substantial number of plants are sickly and dead at the time of inspection, acceptance will not be granted, and the Contractor's responsibility for maintenance of all the plants shall be extended until replacements are made. All dead and unsatisfactory plants shall be promptly removed from the site. Replacements shall conform in all respects to the specification for new plants and shall be planted in the same manner.

PART 2 - PRODUCTS

2.1 PLANT MATERIALS

A. The names of plants required under this contract conform to those given in L.H. Bailey’s Hortus Third, 1976 Edition or most current. Names of varieties not included therein conform generally with names accepted in the nursery trade. All plants shall equal or exceed the measurements specified in the plant list, which are minimum acceptable sizes. Where the size of a plant on the Plant List is a variation between a minimum and maximum dimension, the sizes of the plants furnished shall be equal to the average of the two dimensions. The Contractor shall furnish and plant all plants shown on the Drawings. Plants shall conform to measurements and species designated on plant list and standards as established in American Standard for Nursery Stock ANSI Z60.1, latest edition.

B. All plants shall have a habit of growth that is normal for their species and they shall be sound, healthy and vigorous, with well-developed root systems. All plant material shall be nursery grown and shall be shapely, well-grown, healthy, sound, and free of disease, insect pests, eggs or larvae, and shall have a well-developed root system and be free of injuries. All plants shall be typical of their species or variety and shall have a normal habit of growth. They shall conform to the trade classification of "heavy specimen".

C. All trees and shrubs shall be freshly dug; no heeled-in plants and no plants from cold storage will be accepted. Plants shall have been transplanted or root pruned at least once in the last three years. All plants shall be hardy under climatic conditions similar to those in the locality of the work. Trees shall have a single trunk except as noted. All shrubs shall be healthy, vigorous, and of good color.

D. All tags, strings or any other material attached to the plants shall be removed at the time of planting with the exception of one label for a tree, shrub and groundcover of each variety. All plant materials shall be properly identified by name on legible, weatherproof labels securely attached thereto that shall be legible and accessible for the final inspection and removed after acceptance of the work. Wire identification tags shall not be used.

E. Balling and burlapping of plants shall follow the code of standards currently recommended by the American Standard for Nursery Stock. Balled and burlapped plants (B&B)shall be dug with firm, natural balls of earth of sufficient diameter and depth to encompass the fibrous and feeding root system necessary for full recovery

of the plant. Balls shall be firmly wrapped with burlap or similar material and bound with twine or cord. Burlap shall not be pulled out from under balls during planting operations. B & B plants which cannot be planted immediately on delivery shall be covered with moist soil, mulch or other material to provide protection from drying winds and sun.

F. Container grown plants shall have sufficient roots to hold planting mix intact after removal from containers without being root-bound. Encircling roots that cannot be carefully teased out or lightly pruned without compromising the integrity of the plant shall be rejected. Loose containerized plant material will not be accepted.

G. Plants that meet the measurements specified, but do not possess a normal balance between height and spread will be rejected. All plants injured and plants with root balls broken during transport or planting operations will be rejected. Bare-rooted plants (BR) shall be planted or heeled-in immediately upon delivery. All plants shall be watered as necessary until planted.

H. Plants shall not be pruned before delivery. Only damaged or broken branches of plant material may be pruned and any necessary pruning shall be done at the time of planting. However, under no circumstances shall the central leader of a plant be pruned. Trees which have a damaged or crooked leader, or multiple leaders, will be rejected. Trees with abrasion of the bark, sunscalds, disfiguring knots or fresh cuts of limbs over 1-1/4 inches which have not completed calloused, will be rejected.

I. Certificates of inspection shall accompany the invoice for each shipment of plants as may be required by laws for transportation. File certificates with the Construction Manager prior to unloading material at the Project site. Inspection at place of growth does not preclude rejection of the plants at the site.

J. Plant material which is to be planted after the specified seasons for planting shall be dug during the normal season for digging of the particular plant material and be stored and maintained in good health until planting. The Contractor shall pay all costs for maintaining plant material while it is being stored.

K. Plant List: If there is any discrepancy between quantities shown on the Plant List and work shown on the Drawings, the Contractor shall supply the plants required to complete the work as shown on the Drawings. Where the size of a plant on the Plant List is a variation between a minimum and maximum dimension, the sizes of the plants furnished shall be equal to the average of the two dimensions. Where a single dimension is given, it shall be the minimum size of the plants to be furnished.

2.2 TOPSOIL

A. Topsoil shall conform to the requirements specified in Section 329115 SOIL PREPARATION.

2.3 SOIL CONDITIONING MATERIALS

A. Apply conditioning materials in accordance with the recommendations of testing laboratory as noted in report.

B. Limestone, Sulfur, and Sand – refer to Specification Section 329115 Soil Preparation.

C. Commercial Fertilizer shall conform to state and federal fertilizer laws. Commercial fertilizer shall be uniform in composition, dry and free flowing, and shall be delivered to the site in the original, unopened containers, each bearing the manufacturer's guaranteed analysis. Any fertilizer which becomes caked or otherwise damaged, making it unsuitable for use, will not be accepted. At least 50% by weight of the nitrogen contents of the fertilizer shall be derived from organic sources. A minimum of 35% of the nitrogen shall be water insoluble. Fertilizer shall contain not less than percentage of weight of ingredients shall be as recommended by soil analysis. Refer to 329115 SOIL PREPARATIONS, 1.04 and to 1.03 B. in this section regarding topsoil testing and recommendations on fertilizer analysis and rate. The fertilizer selected should also have a low adjusted salt index to prevent burning.

D. Compost is to be well-composted, stable, and weed-free organic matter, pH range of 5.5 to 7; moisture content 35 to 55 percent by weight; 100 percent passing through ½-inch sieve; soluble salt content of 5 to 10 decisiemens/m; not exceeding 0.5 percent inert contaminants and free of substances toxic to plantings; and as follows:

a. Organic matter content: 50 to 60 percent of dry weight.
b. Feedstock: Agricultural, food, or industrial residuals; biosolids; yard trimmings; or source-separated or compostable mixed solid waste.

E. Humus shall be natural humus, reed peat or sedge peat. Humus shall be free from excessive amounts of zinc, low in wood content, free from hard lumps, shall be furnished in a shredded or granular form, and shall pass through a 1/2 inch mesh screen. According to the methods of testing of AOAC International latest edition, the pH range shall be 5.5 to 7.0 and the organic content shall be not less than 60% as determined by drying at 105 degrees C. The minimum water absorbing ability of the humus shall be 200% by weight on an oven-dry basis.

F. Peat Moss shall be composed of the partly decomposed stems and leaves of any or several species of sphagnum moss. Peat moss shall be free from wood, decomposed colloidal residue and other foreign matter and have a pH range of 3.5 to 5.5, as determined in accordance with the methods of testing of AOAC latest edition. The water absorbing ability of the peat moss shall be a minimum of 1,100% by weight on an oven-dry basis.

G. Manure shall be well-rotted, unleached stable manure not less than eight months and not more than two years old, free from sawdust, shavings, or refuse of any kind and

shall not contain over 25% straw. The Contractor shall furnish information as to kind of disinfectant or chemicals, if any, that may have been used in storage of the manure. Addition of manure shall not raise the soluble salt to levels that are detrimental to plants.

H. Bone Meal shall be fine ground, steam-cooked, packing house bone with a minimum analysis of 23% phosphoric acid and 1.0% nitrogen.

I. Leaf Mold shall be a highly organic dark brown to black spongy residue resulting from the well-aerated composting of deciduous tree parts, free of plants and their roots, debris, and other extraneous matter and shall be uncontaminated by foreign matter and substances harmful to plant growth. The organic matter shall not be less than 85% by weight as determined by the loss on ignition of oven-dried samples. Test samples shall be oven-dried to a constant weight at a temperature of 16 degrees C. The inorganic residue of leaf mold after ignition shall not be finer textured than 4% by weight passing the No. 200 sieve with washing.

J. Perlite is to be horticultural perlite, soil amendment grade.

K. Mulch shall be clean, shredded hardwood mulch, 100% organic, having a maximum moisture content of 40%, and shall be free of any disease and insects. Mulch material shall pass a 1 inch square mesh and be retained on a 1/8 inch square mesh. Mulch shall have been composted for at least two months prior to application. Freshly ground mulch will not be accepted. Finely ground mulch, which inhibits drainage, encourages weed growth or becomes waterlogged will not be accepted. Mulch shall not contain sticks, cones, leaves, or other deleterious matter.

L. Stone Mulch shall be graded stone mulch, light to medium brown in color, with stone sizes of between ½” to 5/8” in size. Submit sample showing typical stone mulch, color and gradation, to Landscape Architect for approval.

2.4 PLANT BACKFILL MIXTURE

A. Whenever possible, the excavated soil should be used or amended to be used as backfill material in order to eliminate or minimize the occurrence of hydrologic discontinuities, and/or soil interface problems common to planting beds containing soils of different texture. Where existing soils have undesirable textures for plants to be installed (heavy clay or pure sand) the on-site soil is to be amended as recommended within the soils report to provide suitable texture. Where soils tests do not reveal textural deficiencies, yet subsequent excavations do, the backfill mixture shall be 66% existing topsoil and 33% topsoil as defined in 329115 SOIL PREPARATION.

B. Plant backfill mixture shall consist of 75% in-situ topsoil and 25% peat moss or leaf mold, by volume, thoroughly mixed together. In addition, plant backfill mixture

shall have fertilizer, compost, humus, cow manure, and other additives added as required by recommendations of the testing laboratory reports.

C. The amended plant backfill mixture shall have a pH of 6.0-6.5 for deciduous plants and 5.0-6.0 for evergreen or semi-evergreen and acid-loving plants. Adjust as noted for specified plants.

D. Amended backfill soil replaces only the soil excavated from tree pit and shrub and ground cover planting beds. Amended backfill soil is not to be installed in lawn areas.

2.5 WATER

A. Water shall be furnished by the Contractor in the quantities required to maintain healthy growth of plant materials and shall be suitable for irrigation and free from ingredients harmful to plant life. The Contractor shall provide all hose and other watering equipment required for the work.

2.6 ANCHORING

A. Below-Grade Tree Stabilizing System: refer to drawings for detail. Use only as required due to site conditions.

B. Root Stabilizers: Root staples made of cold rolled, perforated, steel tubing, 1" outside diameter; cross member 1" x ¼" pot rolled steel; of length and quantity recommended by manufacturer for the species and caliper of tree and as noted on the drawings.

1. Acceptable manufacturers, or approved equivalent.

a. Tree staple
b. Tomahawk

2.7 ANTIDESICCANT

A. Antidesiccant emulsion that will provide a protective film over plant surfaces, permeable enough to permit transpiration, delivered in containers with manufacturer's directions. Antidesiccant shall be Wiltpruf, manufactured by Nursery Specialty Products, Inc., Stubbins Road, Groton Falls, New York, or approved equivalent. Apply according to manufacturer's recommendations.

2.8 ROOT BARRIER

A. Refer to drawings for 24” root barrier detail. Use only as required due to site conditions.

PART 3 - EXECUTION

3.1 PLANTING DATES

A. Plant within the following dates:

1. Evergreen Trees and Shrubs:

a. Spring: April 1 - June 1.

b. Fall: September 1 - November 1.

2. Deciduous Trees and Shrubs:

a. Spring: April 1 - June 15.

b. Fall: October 1 - November 15.

3. Planting shall be prohibited in frozen or muddy ground.

C. Special conditions may warrant a variance in the above dates. Contractor shall notify the Landscape Architect of the conditions and the proposed variance. Permission will be given if the variance is warranted.

D. Approximate planting date schedules shall be furnished by Contractor to the Landscape Architect for approval. Material planted out-of-season shall be given extra care and attention by the Contractor. Out-of-season planting shall be performed entirely at the Contractor's risk.

E. The planting contractor will be notified by the general contractor when other divisions of the work have progressed sufficiently to commence work on the planting operation. Thereafter, planting operations shall be conducted under favorable weather conditions during the next season or seasons which are normal for such work. Removal of rock or other underground obstructions, relocations to avoid obstructions, and provision of drainage for planting areas shall be done only as approved by the owner of the owner’s representative.

3.2 EXCAVATION OF TREE PITS AND SHRUB BEDS

A. Stake out on the ground locations for trees and outlines of all planting beds. Obtain approval of the Landscape Architect before excavation.

B. New plantings shall be located where shown on the plan except where rock, utilities, tree roots or obstructions below ground are encountered or where changes have been made in the proposed construction. Necessary adjustments shall be made only after approval by the owner or the owner’s representative. Reasonable care shall be exercised to have planting pits dug and soil prepared prior to moving plants to their

respective locations to ensure that they will not be unnecessarily exposed to drying or physical damage.

C. Test drainage of plant beds and pits by filling with water twice in succession. Note conditions permitting the retention of water for more than 24 hours. Install underdrains tying tree pits to the storm sewer system or approved outfall.

D. Notify the Landscape Architect in writing of all soil or drainage conditions which the Contractor considers detrimental to the growth of plant material.

E. Roto-till subgrade only if disturbed depth is less than height of root balls on trees and shrubs. Refer to 329115 SOIL PREPARATION regarding roto-till of subgrade.

F. Excavate tree pits and shrub beds to depths required. Tree pits shall be circular in outline. Tree pits shall be three times wider than the root ball diameter. Scarify sides of all tree and shrub planting pits.

G. Spread plant backfill mixture to minimum depth of 12 inches in shrub, ground cover, perennial and annual planting bed. Provide plant backfill mixture in tree planting pit as noted in planting details to the maximum depth of the bottom of the root ball. Refer also to notes in specification section 329115 SOIL PREPARATION.

3.3 PLANTING

A. Place plants in the center of the holes. Use planting mix to backfill plant pits. Place planting mix in layers not to exceed 6 inches thick.

B. Set the trunk flare of the plant slightly above the finish grade (1-2” above surrounding grade) in the same relationship it was to the ground from which it was dug. Remove soil on the ball that is covering the trunk flare. Refer to 1.06 D. *Delivery Storage and Handling* for rejection of tree if more than 2 inches of soil must be removed to expose trunk flare. Set plant plumb, turned to face best side of plant forward, and brace firmly in position until the planting mix has been tamped lightly around the ball and roots. When plant pits have been backfilled approximately two-thirds full, water thoroughly to eliminate air pockets before installing remainder of the planting soil.

C. All broken or frayed roots shall be cut off cleanly. Inspect root system for potential stem girdling roots. Defective roots (J roots, diving or circling) shall be pruned back to live tissue before/ ahead of the root defect. If 30% or more of root system is defective (as determined by independent VNLA certified horticulturist or landscape architect) or if girdling roots are noted after planting, the tree shall be rejected.

D. Burlap twine and other fastening material such as ropes or wires shall be cut from top two-thirds of ball after plant has been set. Cut away and remove all synthetic wrap and plastic or metal containers from around root balls. Loosen surface soil of root ball and comb out any exposed roots. Remove synthetic wrap and slowly

biodegradable materials completely. The plant shall not be rocked back and forth to entirely remove the wrapping material nor shall any other practice be performed which could cause the root ball to break apart. When wire baskets are used on the root ball of plants, the wire shall be removed from the sides of the root ball.

E. Form saucers, 3 inch deep, around tree pits and shrub beds.

F. Water all plants immediately after planting and at a minimum a second time within 24 hours of planting. Each plant and the soil around it shall be thoroughly watered as seasonal conditions warrant. Care should be exercised when watering to avoid flooding of plants and beds, displacement of mulch material and erosion of soil. Avoid use of high pressure hoses. The contractor shall make, at his expense, whatever arrangements may be necessary to ensure an adequate supply of water to meet the needs of this contract during installation. The contractor shall also furnish all necessary hose, equipment attachments and accessories for the adequate watering of planted areas as may be required until acceptance by the owner or the owner's representative.

G. Fertilizer, as recommended by soil test lab report, is to be mixed into backfill soil of the tree pits and shrub beds. The fertilizer rate for continuous ground cover and shrub beds should be derived by calculating the entire root zone area. Be sure that adequate moisture is available when fertilizing so that the fertilizer will be dissolved into the soil solution for root uptake and to avoid burning the roots.

H. Mulch all pits and beds to the required depth of three inches immediately after planting and first watering. In planting areas where slopes exceed 3:1 and at drainage dispersion points or along natural water ways provide erosion control fabric. Mulch shall entirely cover the area of the planting pit, bed, or earth berm around each plant with the exception of the area immediately adjacent to the plant trunk or trunks. Pull mulch away from trunk/stem of plants.

3.4 TREE SUPPORT

A. Firmly anchor all trees immediately after planting if the site conditions warrant. Plants shall stand plumb after anchoring. Anchors shall be installed in accordance with the details shown on the Drawings and is to be removed when tree are rooted and self-supporting. Three anchors shall be provided per tree. Install in such a manner as not to injure the root ball or roots. Trees that remain unstable after one year shall be rejected and replaced.

3.5 PRUNING

A. Each tree and shrub shall be pruned in accordance with American Nurserymen Association Standards to preserve the natural character of the plant.

B. Pruning shall include the following:

1. Remove all dead wood, suckers, and broken or badly bruised branches. Never cut a leader.

2. Use only clean, sharp tools.

C. Apply antidesiccant to foliage if conditions warrant.

3.6 CHEMICAL APPLICATION

A. Pesticides should be used only when necessary to treat an outbreak of a harmful pert or disease problem the owner or the owner's representative shall be enotified 24 hours prior to application of any pesticide.

B. All pesticides shall be products of recognized commercial manufacturers, and shall conform to all applicable federal, state, and local pesticide laws. Pesticides shall be applied with calibrated equipment according to EPA label restrictions and regulations by a certified applicator. Any damage incurred to the site, adjacent properties, or applicator during pesticide applications will be the sole responsibility of the contractor.

3.7 CLEAN-UP

A. Soil or other material deposited on paved areas shall be promptly removed. Waste material shall be removed from the site daily.

B. Upon completion of planting, all excess stones, debris, and soil shall be cleaned up and removed from the site.

C. Keep pavements clean and work area in an orderly condition at all times.

3.8 MAINTENANCE AND PROTECTION OF PLANTINGS

A. Maintenance shall begin immediately after each plant is planted and shall continue until final acceptance by the owner or the owner's representative.

B. Maintenance shall include:

1. Pruning, watering, cultivating, weeding, mulching, adjusting anchors, resetting plants to proper grades or upright position, restoration of the planting saucer, and furnishing and applying sprays required to keep the planting free of insects and disease, removal of dead materials and other necessary operations.

B. Protect planting areas and plants against trespassing and damage of all kinds for the duration of the maintenance period. If any plants become damaged or injured, they

shall be treated or replaced as required. Nothing in these notes is intended to relieve the contractor of his responsibility to repair existing lawn areas damaged by workmen engaged in the completion of this project.

C. All plantings shall be thoroughly saturated at least twice per week during maintenance period.

3.9 INSPECTION AND ACCEPTANCE OF THE WORK

A. Inspection of the work to determine completion of the contract, exclusive of the one year guarantee, and possible replacement of the plantings, will be made by the Owner or the Owner's representative at the conclusion of the installation period upon written notice requesting such inspection. Request shall be submitted by contractgor at least ten days prior to the anticipated date for inspection. After inspection, the contractor will be notified in writing by the owner or owner's representative of acceptance of the work, exclusive of the possible replacement of plants subject to guarantee; or, if there are any deficiencies, the contractor will be notified of the requirements necessary for completion of the work. Plantings shall not be considered accepted until all deficientcies have been corrected and approved in writing.

3.10 REJECTION AND REPLACEMENT

A. Promptly remove rejected plant material from site.

B. Replace as soon as planting conditions permit with plants of same species and of the required quality or as approved by Landscape Architect.

3.11 ONE YEAR GUARANTEE INSPECTION

A. Nursery stock shall be fully guaranteed for one full year after date of final acceptance. All plants that fail to make new growth from a dormant condition, or that die during the first year after planting or that are severely disfigured (30% or more of the plant dies)are to be replaced. All replacements shall conform to the original specifications as to size and type. All costs of replacement shall be borne by the contractor.

B. One year after the date of acceptance, the Owner or Landscape Architect shall conduct an inspection of the condition of the plantings. The Owner or Landscape Architect will provide a written report on the results of the inspection. The Contractor shall replace any dead or unhealthy plants at this time.

C. The Contractor shall remove tree wraps and tree support systems on nursery-grown plants at this time.

END OF SECTION 329000

SECTION 329115 - SOIL PREPARATION

PART 1 - GENERAL

1.01 DESCRIPTION

A. Drawings and general provisions of the Contract.

1.02 RELATED DOCUMENTS

A. Section 329000 - PLANTING

B. Section 329220 – SEEDING AND SODDING

1.03 SUBMITTALS

A. Manufacturer’s Product Data

1. Submit material manufacturer's literature and installation instructions where applicable attesting that the following materials meet the requirements specified:

a. Soil Amendments

B. Soil Test Reports

1. Minimum one month prior to spreading and amending on-site topsoil, and ordering the topsoil for import (if required), contractor shall submit soil test report and recommendations for soil amendments to the Landscape Architect for review and approval. Do not order topsoil or amendment materials until the Landscape Architect’s approval has been obtained. Delivered materials shall closely match the approved samples.

a. Topsoil: The Contractor shall employ a pre-approved certified testing laboratory that will test and provide recommendation on amendments for trees, shrubs, and turfgrass to test on-site and off-site topsoil materials being considered for import. Submit test reports of each directly to the Landscape Architect.

1.04 TOPSOIL TESTING

A. All topsoil obtained from on-site and from off-site sources used in the work shall be tested prior to being ordered, spread or mixed. All testing shall be done by pre-approved independent soil test laboratory capable of performing all required tests. Contractor shall provide required representative samples of material to determine soil properties to a depth of one foot with test samples taken at a minimum of every

5000 square feet and for every area representing a different HSG soil type (A,B,C,D).

1. Hydrologic Soil Groups(HSG), as recognized by USDA, United States Department of Agriculture NRCS, Natural Resources Conservation Service soil classification and defined by the National Engineering Handbook.

    a. Group A- high infiltration rate when wet, low runoff potential.

    b. Group B- moderate infiltration, low runoff potential.

    c. Group C- slow infiltration, higher runoff potential

    d. Group D- very slow infiltration rate, highest runoff potential.

B. Test analysis shall be in accordance with the current AOAC International "Standards" and shall include:

1. Classification of soil.
2. Percent sand, silt and clay particles.
3. Percent organic content.
4. Percent soluble salt index.
5. Macronutrients: phosphorus, potassium, calcium, magnesium, Sulfur
6. Micronutrients: Zinc, Manganese, Iron, Copper, Boron
7. Soil pH
8. Cation Exchange Capacity (C.E.C.)
9. Location of sample source.

C. Test reports shall include specific recommendations as to the exact types, times, and rates of application of soil additives and fertilizers based upon the soil test results and type of material to be planted.

D. Specified soil additive materials and fertilizer types and requirements and all soil additives shall be adjusted to comply with test reports.

E. Secondary testing for topsoil requirements will be required.

1. Refer also to Specification Section 329000 PLANTING and 329220 SEEDING AND SODDING.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Topsoil

1. On site topsoil must be stockpiled separately from subsoil and shall be utilized to the greatest extent possible throughout the project. Refer to the plans for silt fence requirements to surround and protect stockpiles of soil.

2. Topsoil requirements:

   a. pH range of 5.5 to 7.0

   b. Range of 3-5% percent organic material content

   c. Soluble salts less than 500 ppm.

   d. Preferred texture is to be sandy loam, loam, or sandy clay loam.

   e. Remove stones one inch or larger in any dimension and other extraneous materials harmful to plant growth prior to reuse on site.

   f. Topsoil to be respread is to be screened and sifted.

3. On site topsoil depth is approximately as noted in geotechnical report. Refer to Geotechnical Engineering Report for this project.

4. If on site topsoil is not of sufficient quantity or cannot be amended to meet specified requirements, obtain topsoil displaced from naturally well-drained sites where topsoil occurs at least 4 inches deep; do not obtain from bogs or marshes. Refer to testing requirements and approval process prior to ordering import topsoil.

B. Inorganic Soil Amendments

1. Lime: Dolomite agricultural ground limestone containing at least 85% of total carbonates and ground to such fineness that at least 50% will pass a 100 mesh sieve and at least 90% will pass a 30 mesh sieve. Limestone shall be uniform in composition, and shall be dry and free flowing. Limestone shall be delivered to the site in original unopened containers, each bearing manufacturer's guaranteed analysis.

2. Sulfur: Granular, biodegradable, containing a minimum of 90 percent sulfur, with a minimum 99 percent passing through No. 6 sieve and a maximum 10 percent passing through No. 40 sieve.

3. Iron Sulfate: Granulated ferrous sulfate containing a minimum of 20 percent iron and 10 percent sulfur.

4. Aluminum Sulfate: Commercial grade, unadulterated.

5. Agricultural Gypsum: Finely ground, containing a minimum of 90 percent calcium sulfate.

6. Superphosphate: Superphosphate shall be composed of finely ground phosphate rock, as commonly used for agricultural purposes, and containing not less than 20% available phosphoric acid. Superphosphate shall be delivered to the site in the original, unopened containers, each bearing the manufacturer's guaranteed analysis and submitted to the Engineer for approval. Any superphosphate that becomes caked or otherwise damaged (making it unsuitable for use) will be rejected.

7. Sand: Clean, washed, natural or manufactured, free of toxic materials.

C. Organic Soil Amendments

1. Refer to Specification Section 329000 PLANTING and 329220 SEEDING AND SODDING.

D. Planting Accessories

1. Selective herbicides: EPA registered and approved, of type recommended by manufacturer for application.

E. Erosion-Control Materials

1. Erosion-control blankets: Biodegradable wood excelsior, straw, or coconut-fiber mat enclosed in a photodegradable plastic mesh. Include manufacturer's recommended steel wire staples, six inches long.

2. Erosion-control fiber mesh: Biodegradable twisted jute or spun-coir mesh, a minimum of 0.92 lb/sq. yd., with 50 to 65 percent open area. Include manufacturer's recommended steel wire staples, 6 inches long.

F. Planting Soil Mix

1. Refer to Specification Section 329000 PLANTING.

2.02 GENERAL REQUIREMENTS

A. Soil-testing laboratory qualifications: An independent laboratory, with the experience and capability to conduct the testing indicated and that specializes in types of tests to be performed on topsoil for evaluating plant available nutrients for trees, shrubs, ground cover and turf grass.

B. Topsoil analysis: Furnish soil analysis by a qualified soil-testing laboratory stating percentages of organic matter; gradation of sand, silt, and clay content; cation exchange capacity; deleterious material; pH; and mineral and plant-nutrient content

of topsoil. Provide rating after each value, VL (Very Low), L (Low), M (Medium), H (High), VH (Very High). Provide written recommendation for amendments to bring soil into recommended ranges for plants as specified on this project.

1. Report suitability of existing topsoil for plant and turf grass growth. State recommended quantities of nitrogen, phosphorus, and potash nutrients, micronutrients and soil amendments to be added to produce a satisfactory topsoil.

    a. Soil test report is to provide a separate recommendation for plants that require high or low pH and that require specific amendments to properly uptake nutrients.

2. If existing topsoil is not available in sufficient quantity or cannot be amended to meet minimum requirements, test and provide report for import topsoil suitable for plant and turf grass growth.

C. Preparing Soil: After lime is applied, areas to be seeded shall be prepared in accordance with the following: Slopes 3:1 or flatter shall be loosened to a depth of approximately 3 inches by disking, harrowing, or other approved methods. Loosening of soil on excavated slopes steeper than 3:1 will not be required except to eliminate hard or crusted surfaces. Shoulders and embankment slopes steeper than 3:1 shall be loosened to a depth of approximately 1 inch. Clods, loose stones, and other foreign material larger than 3 inches in any dimension shall be removed and disposed of or as approved by the Engineer/ Landscape Architect. Gullies, washes, and disturbed areas that develop subsequent to final dressing shall be repaired before they are seeded.

PART 3 - EXECUTION

3.01 GENERAL REQUIREMENTS

A. Delivery, Storage and Handling: Fertilizer, and soil amendments shall be delivered to the site in the original, unopened containers bearing the manufacturer’s guaranteed analysis, name, trademark, and statement of conformance to state and federal laws. In lieu of containers, fertilizer and soil amendments may be furnished in bulk with a manufacturer’s certificate indicating the above information accompanying each delivery. During delivery fertilizer and soil amendments shall be kept in dry storage away from contaminants. Precautions shall be taken to protect containers from rupture prior to use.

B. Examination

1. Examine areas to receive topsoil for compliance with requirements and other conditions affecting performance. Proceed with installation only after unsatisfactory conditions have been corrected.

C. Preparation

1. Protect structures, utilities, sidewalks, pavements, and other facilities, trees, shrubs, and plantings from damage caused by topsoil spreading and amending operations.

2. Provide erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways. Provide temporary seeding as required.

3. Remove existing vegetation, including temporary seeding, prior to installation of permanent planting, seeding and sodding.

D. Topsoil Respread & Amendments

1. Limit subgrade preparation to areas to be planted.

2. Newly graded subgrades: Prior to placement of topsoil or plant backfill mixture, all planting areas shall be loosened by roto-tilling subgrade to a depth of six inches in lawn areas. Areas under the drip line of trees and shrubs to remain in place shall not be roto-tilled. A planting area is any area in which new planting occurs. Refer to 329000, PLANTING, for excavation of individual tree and shrub pits. Prior to the excavation of the tree and shrub pits, roto-till subgrade only if the disturbed depth is less than the depth of the root ball of trees and shrubs. In continuous shrub and ground cover beds, the roto-tilled perimeter should extend to a distance of 5 times the diameter of a single root ball of the perimeter plants.

3. Remove stones larger than one inch in any dimension and sticks, roots, rubbish, and other extraneous matter and legally dispose of them off Owner's property.

4. Topsoil in lawn areas is to be respread as a minimum six (6) inch thick layer, after compaction, in all areas to be seeded or sodded. Maximum topsoil depth in areas to be seeded or sodded after compaction is to be nine (9) inches. Refer to Specification Section 329000 PLANTING for depth of plant backfill mixture in planting pits. Install minimum 12” depth of plant backfill mixture in shrub, ground cover, annual and perennial planting beds.

5. Provide fertilizer as directed in soil test report.

   a. Spread fertilizer and pH balancing agents at rates recommended by the soil test report to achieve a pH of 5.5 to 6.8. Blend additives thoroughly into upper 4” of topsoil. Remove rocks or other debris which may surface. Till areas until soil is loose and friable, and all soil amendments are uniformly distributed.

b. Work all areas to a smooth even surface free from irregularities, ridges, or depressions. Prepared areas shall meet required finish grade elevations and shall drain adequately. Repair all washed and eroded portions.
c. Moisten prepared areas if soil is dry. Water thoroughly, then allow surface moisture to evaporate. Do not create muddy soil conditions.

6. Provide topsoil from approved off-site source as required to achieve minimum depths as noted above.

7. Prior to planting, fill holes in proposed lawn and planting beds if settlement has occurred and in existing lawn areas that are to be rejuvenated. Where holes in rejuvenated lawn are greater than 6” deep, install sand in compacted 4” lifts and top with 6” deep topsoil. Refer also to 329220 SEEDING AND SODDING for notes on lawn renovation.

8. Thoroughly blend amended topsoil off-site before spreading or spread topsoil, apply soil amendments and fertilizer on surface, and thoroughly blend amended topsoil mix.

a. Delay mixing fertilizer with planting soil if planting will not proceed within a few days.

b. Mix pH amendment with dry soil before mixing fertilizer.

9. Spread plant backfill mixture to a depth as noted in specification section 329000 PLANTING to meet finish grades after light rolling and natural settlement. Do not spread if planting soil or subgrade is frozen, muddy, or excessively wet.

a. Spread approximately one-half the thickness of planting soil mix over loosened subgrade. Mix thoroughly into top 2 inches of subgrade. Spread remainder of plant backfill mixture.

10. Unchanged subgrades: If lawns are to be planted in areas unaltered or undisturbed by excavating, grading, or surface soil stripping operations, prepare surface soil as follows:

a. Remove existing grass, vegetation, and turf. Do not mix into surface soil.
b. Loosen surface soil to a depth of at least of six inches. Apply soil amendments and fertilizers according to soil test report and planting soil mix proportions and mix thoroughly into top six inches of soil. Till soil to a homogeneous mixture of fine texture.
c. Remove stones larger than ½ inch in any dimension and sticks, roots, trash, and other extraneous matter.
d. Remove debris and legally dispose of debris and waste material, including grass, vegetation, and turf, off Owner's property.

11. Finish grading: Grade planting areas to a smooth, uniform surface plane with loose, uniformly fine texture. Grade to within plus or minus 1/2 inch of finish elevation. Roll and rake, remove ridges, and fill depressions to meet finish grades. Limit fine grading to areas that can be planted in the immediate future.

12. Moisten prepared lawn areas before planting if soil is dry. Water thoroughly and allow surface to dry before planting. Do not create muddy soil.

13. Restore areas if eroded or otherwise disturbed after finish grading and before planting.

E. Cleanup and Protection

1. Promptly remove soil and debris created by lawn work from paved areas. Clean wheels of vehicles before leaving site to avoid tracking soil onto roads, walks, or other paved areas.

3.02 MANUFACTURER CERTIFICATION

The Contractor shall submit:

A. Product certificates: For soil amendments and fertilizers, signed by product manufacturer.

B. Material test reports: For existing topsoil to be stockpiled and respreads, for existing topsoil to remain and be planted and for imported topsoil.

3.03 UNIT PRICES

A. The contract price paid per square yard for topsoil, lawn renovation and seeding as noted in the unit price tables shall include, but is not limited to, all work to be a complete installation of lawn including the reuse of stockpiled topsoil or the provision of new topsoil complete with all soil amendments, fertilizer, mulch, erosion control materials, seed, and the performance of all maintenance and warranty requirements as specified in Section 329220 SEEDING AND SODDING and Section 329000 PLANTING.

B. The renovation of existing lawn that has been damaged due to Contractor's operations or storage of materials beyond the limit of work for the establishment of new lawn will not be measured and paid for as such but will be the Contractor's responsibility.

END OF SECTION 329115

SECTION 329220 - SEEDING AND SODDING

PART 1 - GENERAL

1.1 DESCRIPTION

A. This Section specifies requirements for soil amendments, seeding, and sodding for site landscape areas.

B. The work includes:

1. Amendments to topsoil.
2. Seeding, sodding, and mulching.
3. Maintenance of seeded and sodded areas.

1.2 RELATED SECTIONS

A. Sections which directly relate to the work of this Section include:

1. Section 329115 - SOIL PREPARATION.
2. Section 329000 – PLANTING.

1.3 SUBMITTALS

A. Manufacturers Product Data

1. Submit material specifications and installation instructions where applicable attesting that the following materials meet the requirements specified:

a. Soil Amendments
b. Seed
c. Sod

B. Soil Test Reports

1. Minimum one month prior to ordering, importing, spreading or amending the topsoil, submit soil test report to the Landscape Architect for review and approval. Do not order materials until the Landscape Architect's approval has been obtained. Delivered materials shall closely match the approved samples.
   a. Refer to Section 329115 SOIL PREPARATION for soil testing requirements.

b. Secondary testing of topsoil samples may be required to verify the amount of soil amendment that will be required in order to bring pH levels, percentage of organic matter, and other levels of nutrients within the recommended range without raising soluble salts and other nutrients and micronutrients to toxic levels. This testing will be done as directed by soil test labs to samples of the topsoil with varying amounts of amendments added to each sample and resubmitted to the soil testing agency. Written report of secondary testing with recommendations shall be submitted prior to amendments being added to the topsoil on site. Landscape Architect is to review and approve recommendations.

C. Certificates

1. The seed vendor's Certificate of Compliance and invoice showing quantity for each grass seed mixture stating botanical and common name, percentage by weight, percentages of purity, weed content, germination of the seed, the net weight of seed, and date of shipment. No seed shall be sown until the Contractor has submitted these certificates.

D. Planting Schedule

Indicating anticipated planting dates for each type of seed/sod.

E. Maintenance Manual

1. The Contractor shall submit a written manual prepared for the Owner that outlines a schedule for procedures to be established by Owner for maintenance of lawns during the calendar year for seeded and/or sodded lawns. This maintenance schedule should include timing and methods for mowing, watering, aeration, fertilization, liming, and other lawn maintenance operations.

F. Submittal Schedule

1. Before installation:

a. Manufacturer's product data for seed and sod.
b. Soil test reports.
c. Seed certification.
d. Hydroseed mix.

2. After installation and before acceptance:

a. Maintenance Manual.

1.4 QUALITY ASSURANCE

A. All work shall be performed by personnel experienced in lawn installation under the full time supervision of a qualified foreman.

B. Work shall be coordinated with all other trades on site.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver material to the site in original unopened packages, showing weight, manufacturer's name, and guaranteed analysis.

B. Store materials in a manner that their effectiveness and usability will not be diminished or destroyed. Materials shall be uniform in composition, dry, unfrozen, and free flowing. Any material which has become caked or otherwise damaged or which does not meet specified requirements will be rejected.

1.6 INSPECTION FOR ACCEPTANCE

A. Conditions of Acceptance

1. Acceptance shall be given for the entire portion of the lawn areas. No partial acceptance will be given.
2. Lawns shall exhibit a uniform, thick, well-developed stand of grass. Lawn areas shall have not bare spots in excess of four inches in diameter and bare spots shall comprise no more than 2% of the total area of the lawn.
3. Lawn areas shall not exhibit signs of damage from erosion, washouts, gullies, or other causes.
4. Pavement surfaces and site improvements adjacent to lawn areas shall be clean and shall be free of spills or overspray from placing or handling of topsoil and seeding operations.

B. Inspection and Acceptance

1. Upon written request of the Contractor, the Engineer/ Landscape Architect will inspect all lawn areas to determine completion of work. This request must be submitted at least five days prior to the anticipated inspection date.
2. If the lawn areas are not acceptable, the Engineer/ Landscape Architect will indicate corrective measures to be taken, and shall extend the maintenance period as necessary for the completion of the work. The Contractor shall request a second inspection of the lawns after corrective measures have been accomplished. This process shall be repeated until the total lawn area being inspected is acceptable.

3. When the lawn areas are acceptable, a meeting of the Contractor and Owner's Representative will be arranged to accept the lawn work. A final inspection will be a part of this meeting. At this meeting, the Contractor shall be furnished with a written acceptance of the lawn section being approved. The Contractor shall turn over maintenance of the lawn areas to the Owner after the acceptance of the lawn in writing.
4. Following the acceptance of lawns, the Contractor shall provide the Owner with access to all lawn areas as required for the Owner's maintenance work.

C. Site Cleanup

1. The Contractor shall leave the site in a clean and neat condition. Final acceptance will not be granted until this condition is met.

PART 2 - PRODUCTS

2.1 TOPSOIL

A. Topsoil shall conform to the requirements specified in Section 329115 SOIL PREPARATION.

2.2 SOIL CONDITIONING MATERIALS

A. Apply conditioning materials in accordance with the recommendations of soil testing laboratory as noted in report.

B. Limestone, Sulfur, Superphosphate and Sand –refer to Specification Section 329115 Soil Preparation.

C. Fertilizer: Fertilizer shall conform to state and federal fertilizer laws. The fertilizer shall be uniform in composition, dry and free flowing, and shall be delivered to the site in the original, unopened containers, each bearing the manufacturer's guaranteed analysis. Any fertilizer which becomes caked or otherwise damaged, making it unsuitable for use, will not be accepted.

1. At least 50% by weight of the nitrogen contents of the fertilizer shall be derived from organic sources. A minimum of 35% of the nitrogen shall be water insoluble.
2. Fertilizer shall contain not less than percentage of weight of ingredients as recommended by in soil test report.

D. Compost is to be well-composted, stable, and weed-free organic matter, pH range of 5.5 to 7; moisture content 35 to 55 percent by weight; 100 percent passing through ½-inch sieve; soluble salt content of 5 to 10 decisiemens/m; not exceeding 0.5 percent inert contaminants and free of substances toxic to plantings; and as follows:

a. Organic matter content: 50 to 60 percent of dry weight.
b. Feedstock: Agricultural, food, or industrial residuals; biosolids; yard trimmings; or source-separated or compostable mixed solid waste.

2.3 WATER

A. Water shall be furnished by the Contractor, suitable for irrigation, and free from ingredients harmful to plant life. Hoses and other watering equipment required for the work shall be furnished by the Contractor.

2.4 SEED

A. Certified seed will be used for all permanent seeding whenever possible. Certified seed is inspected by the Virginia Crop Improvement Association or the certifying agency in other states. The seed must meet published state standards and bear an official "Certified Seed" label in accordance with VAESCH Standard and Specification 3.32 "Permanent Seeding" Appendix 3.32-a.

B. Selection of plant materials is based on climate, topography, soils, land use, and planting season.

C. Refer to drawings for seed mixture and rates.

D. When using some varieties of turfgrasses, the National Turfgrass Evaluation (NTEP) recommended turfgrass species may be used to substitute currently available and better performing seed based on results from regional test site closest to the project site. The number of varieties and proportions must match the seed specification mix specified. Provide documentation of NTEP rating on proposed substitution as compared to seed specified. Consumer protection programs have been devised to identify quality of seed of the varieties recommended by the Virginia Cooperative Extension Service. These will bear a label indicating that they are approved by the Association.

E. Native seed mixtures are designed for a specific physiographic region and are based on intended use. Follow specified seed mix noted on the drawings or provide documentation of requested substitutions of native seed for approval. Refer to drawings for seed mixture and proportions.

2.5 SOD

A. Sod used shall be state certified and JMU Standard. Certified turfgrass sod is grown from certified seed inspected and certified by the Virginia Crop Improvement Association (VCIA) or the certifying agency in other states. This ensures genetic purity, high quality, freedom from noxious weeds and excessive insect or disease

problems. The sod must meet published state standards and bear an official blue "Certified Turf" label on the bill of lading.

B. Sod shall be machine cut at a uniform thickness of 3/4 inch (plus or minus 1/4 inch) at the time of cutting. This thickness shall exclude shoot growth and thatch.

C. Pieces of sod shall be cut to the supplier's standard width and length, with a maximum allowable deviation in any dimension of 5%. Torn or uneven pads will not be accepted.

D. Standard size sections of sod shall be strong enough to support their own weight and retain their size and shape when suspended from a firm grasp on one end of the section.

E. Sod shall not be cut or laid in excessively wet or dry weather.

F. Sod shall be harvested, delivered, and installed within a period of 36 hours.

G. Refer to drawings for sod type.

2.6 MULCH

A. Organic Mulch

1. Organic mulch may be used in any area where mulch is required, subject to the restrictions noted in VAESCH Standard and Specification 3.35 "Mulching" Table 3.35-A.
2. Select mulch materials based on site requirements, availability of materials, and availability of labor and equipment. Table 3.35-A lists the most commonly used organic mulches. Other materials, such as peanut hulls and cotton burs, may be used with permission of the local plan-approving authority.
3. Straw mulch shall be stalks from oats, wheat rye, barley or rice that are free from noxious weeds, chemicals, mold or other objectionable materials with a nonasphaltic mulch tackifier. Straw shall be air-dry condition suitable for placing. Straw supplied for mechanical application shall be chopped.

2.7 SOIL STABILIZATION BLANKETS AND MATTING

A. Matting for erosion control shall be provided in compliance with VAESCH Standard and Specification 3.36 "Soil Stabilization Blankets and Matting."

2.8 HYDROSEED MIX

A. The Contractor shall submit a certified statement as to number of lbs. of fertilizer, amounts and types of grass seed, and processed fiber, per 100 gallons of water.

1. Mulch for hydroseeding shall be supplied for use with hydraulic application of grass seed and fertilizer. It shall consist of Futerra F4 Netless by Profile Products LLC or approved equal.
2. Non-asphaltic tackifier: colloidal tackifier recommended by fiber-mulch manufacturer for slurry application; nontoxic and free of plant growth of germination inhibitors.

PART 3 – EXECUTION

3.1 SEED AND SOD BED PREPARATION

A. Coordinate planting with placement of topsoil, the installation of the irrigation system and with other contractors as the landscape contractor is required to install and maintain his finished work at his expense. When conditions detrimental to lawn establishment, growth and maintenance are encountered, such as rubble fill, adverse drainage conditions of obstructions, notify the owner's representative before beginning work.

B. Topsoil is to be loose, in friable condition. If topsoil has become crusty, hardened or eroded since being spread, it shall be a part of this work to restore the soil to the loose condition described above. Add soil amendments as recommended in soil test report and thoroughly mix into the upper 4" of topsoil as noted in 329115 SOIL PREPARATION. Remove any rocks or other debris which may surface and work all areas to a smooth even surface free from irregularities, ridges, or depressions. Prepared areas shall meet required finish grade elevations and shall drain adequately. Repair washed and eroded portions. Moisten prepared areas if soil is dry. Water thoroughly, then allow the surface moisture to evaporate. Do not create muddy conditions.

C. Unless otherwise specified, seed operations shall be performed at the times specified on the drawings. Seed and sod operations shall not be performed when the ground is frozen or when soil or weather conditions would prevent proper soil preparation and subsequent operations. Do not seed when wind velocity exceeds 5 miles per hour. Sow seed with spreader or seeding machine. Distribute seed evenly over entire area by sowing equal quantity in two directions at right angles to each other. Rake seed lightly into top ¼" of soil, firm entire area with a roller not exceeding 90 lbs. per foot or roller width, and water with a fine spray. Unless indicated otherwise on the drawings, protect newly seeded areas by spreading mulch to a uniform and continuous depth of 1-1/2" loose measurement (70-90 lbs/1000 SF).

D. When hydroseeding is performed, nozzles or sprays shall not be directed toward the ground in a manner that will cause erosion or runoff. The Contractor shall notify the Engineer/ Landscape Architect at least 48 hours prior to beginning seed operations.

E. Contractor shall comply with the following VAESCH Standards and Specifications. Where the specifications for this project are more stringent they will supersede the VAESCH Standards and Specifications:

1. Standard and Specification 3.29 “Surface Roughening”
2. Standard and Specification 3.30 “Topsoiling”
3. Standard and Specification 3.32 “Permanent Seeding”
4. Standard and Specification 3.33 “Sodding”

3.2 HYDROSEED BED PREPARATION

A. Prepare seed bed for hydroseeding the same as for seeding and sodding, but do not incorporate fertilizer into the top 3 inches of topsoil.

B. Hydroseeding shall be applied with a spray machine designed for this purpose and approved by the Engineer.

C. Install mulch per manufacturer’s recommendations using manufacturer’s biodegradable staples.

D. Mix specified seed, starter fertilizer, and fiber mulch in water using equipment specifically designed for hydroseed application. Continue mixing until uniformly blended into homogeneous slurry suitable for hydraulic application.

E. Apply slurry uniformly to all areas to be seeded in a two-step process. Apply first slurry coat at a rate so that mulch component is deposited at not less than 500 lb/ Acre dry weight, and seed component is deposited not less than the specified seed-sowing rate. Apply slurry cover coat of fiber mulch at the rate recommended by the manufacturer for the steepest area of slope.

3.3 SEEDING

A. Contractor shall comply with VAESCH Standard and Specification 3.32 “Permanent Seeding.”

3.4 SODDING

A. Contractor shall comply with VAESCH Standard and Specification 3.33 “Sodding.”

3.5 LAWN RENOVATION

A. Renovate existing lawn where disturbed or damaged.

B. Renovate existing lawn damaged by Contractor's operations, such as storage of materials or equipment and movement of vehicles.

C. Renovate Lawn where settlement or washouts occur or where minor regrading is required.

D. Remove sod and vegetation from diseased or unsatisfactory lawn areas; do not bury in soil.

E. Remove topsoil containing foreign materials resulting from Contractor's operations, including oil drippings, fuel spills, stone, gravel, and other construction materials, and replace with new topsoil.

F. Mow, dethatch, core aerate, and rake existing lawn.

G. Remove weeds before installing seed. Where weeds are extensive, apply selective herbicides as required. Do not use pre-emergence herbicides.

H. Remove waste and foreign materials, including weeds, soil cores, grass, vegetation, and turf, and legally dispose of them off Owner's property.

I. Till stripped, bare, and compacted areas thoroughly to a soil depth of 6 inches.

J. Apply soil amendments and initial fertilizers required for establishing new lawns and mix thoroughly into top four inches of existing soil. Provide new planting soil to fill low spots and meet finish grades.

K. Apply seed as required for new lawns.

L. Water newly planted areas and keep moist until new lawn is established.

3.6 MAINTENANCE AND PROTECTION

A. Maintenance of seeded and sodded areas shall begin immediately after installation. Maintenance includes watering, weeding, mowing and edging, reseeding, replacement of dead sod, disease and insect pest control, repair of all erosion damage, and any other procedures consistent with good horticultural practice, required to ensure normal, vigorous, and healthy growth. Maintenance shall continue until final acceptance of the work.

1. Landscape contractor is responsible to determine water application rates.

2. Stands in lawn areas shall be mowed whenever the average height reaches 1-1/2” for warm season grasses and 2-2-1/2” for cool season grasses.

B. Maintenance shall also include all temporary protection fences, barriers, signs, and all other work incidental to proper maintenance. Maintain barricades throughout maintenance period and remove after lawn is established.

C. Scattered bare spots will be allowed up to a maximum of 2% of any lawn area, provided none are larger than 72 square inches. After the grass has sprouted, all bare areas shall be re-seeded or re-sodded repeatedly until all areas are covered with a satisfactory growth of grass. Do not remove more than one-third of the grass blade. All lawns shall receive at least three mowings before acceptance.

D. The seeded and sodded areas shall be maintained in a continuous moist condition, satisfactory for good germination and growth of grass until acceptance.

E. Six weeks after the seeded areas have become established, fertilizer shall be applied over the entire area. Sod shall be fertilized at the time of the second mowing.

F. Remove erosion-control measures after grass establishment period.

G. Clean-up and protection

1. Keep pavements and work area in a clean and orderly condition on a daily basis.
2. Protect seeded areas and materials from damage due to operations by other contractors, trades, and trespassers. Maintain protection during installation and until final acceptance. Treat, repair, or replace damaged seeded areas as directed.

3.7 WARRANTY

A. The establishment period for lawn areas shall be from the time of installation until the final acceptance of the established lawn in writing. An established stand shall be uniform in coverage and of the specified mixture. No individual lawn area shall have bare spots in excess of three inches in diameter and bare sport shall comprise no more than two percent of the total lawn area. All replacements shall be subject to the warranty requirements as the original stock. Any damage done during replacement operations shall be the responsibilty of the landscape contractor.

3.8 COMPLETION AND ACCEPTANCE

A. The completion of the contract will be accepted and notice of completion recorded only when the entire contract is completed to the satisfaction of the owner's representative.

B. Within then (10) days fo the general contractor's notification that the installation is complete, the owner's representative will inspecct the installation and if, final acceptance is not given, will prepare a "punch list".

C. Final acceptance will be given by the owner's representative upon satisfactory completion of all work including "punch list" items.

END OF SECTION 329220

SECTION 334020 - WARNING AND TRACER TAPE

PART 1 - GENERAL

1.1 WORK INCLUDED

A. This Section covers the furnishing, handling, and installation of warning and tracer tape, as called for on the Drawings.

1.2 SUBMITTALS

A. In accordance with requirements of General Specifications, submit the following:

1. Six sets of manufacturer's literature on the materials, colors and printing specified herein, shall be submitted to the A/E for review.
2. Tape samples shall also be submitted to the A/E for review.

PART 2 - PRODUCT

2.1 ACCEPTABLE MANUFACTURERS

A. Tape shall be manufactured by: Terra-Tape and Terra-Tape D by Reef Industries, Houston, TX; Markline and Detectatape by Allen Systems, Houston, TX; an equivalent tape by Industrial Tape and Supply Company, Atlanta, GA; or approved equal.

2.2 TAPE

A. Warning and tracer tape shall be at least 6 inches wide.

B. Tracer tape for non-ferrous pipe or conduit shall be constructed of a metallic core bonded to plastic layers to enable detection by a metal detector when the tape is buried up to 3 feet deep. The metallic tracer tape shall be a minimum 5-mil thick.

C. Warning tape for ferrous pipe or conduit shall consist of multiple bonded plastic layers. The non-metallic tracer tape shall elongate at least 500% before breaking.

D. The tape shall bear the wording (or approved equivalent): 'BURIED DRAIN LINE BELOW' (with 'DRAIN' replaced by 'WATER', 'SEWER', 'ELECTRICAL', 'GAS', 'TELEPHONE', or 'CHEMICAL' as appropriate), continuously repeated every 30 inches to identify the pipe.

E. Tape colors shall be as follows as recommended by the American Public Works Association (APWA):

Electric	Red
Gas and Oil	Yellow
Communications	Orange
Water	Blue
Sewer and Drain	Green
Chemical	Red (not APWA)

PART 3 - EXECUTION

3.1 INSTALLATION

A. Warning and tracer tape shall be installed above the pipe or conduit it is to identify. The depth of the warning or tracer tape shall be the shallower of 3 feet or half the distance between the crown of the pipe or conduit and the finished grade.

B. Follow the manufacturer's recommendations for installation.

C. The requirements of this section shall not replace the Owner's requirement for a #10 green insulating conductor in the trench with all underground piping.

END OF SECTION 334020

ATTACHMENT A. REFERENCES LIST

Indicate below a listing of at least three (3) current or recent client references, either commercial or governmental, that your company is servicing, has serviced, or has provided similar goods or services.

Reference #1

Company:_____ Contact Person:_____

Phone #:_____ Email:_____

Project:_____ Dates of Service:_____

Reference #2

Company:_____ Contact Person:_____

Phone #:_____ Email:_____

Project:_____ Dates of Service:_____

Reference #3

Company:_____ Contact Person:_____

Phone #:_____ Email:_____

Project:_____ Dates of Service:_____

Indicate below a listing of at least one (1) current or recent client/account that has terminated your company's services within the last two (2) years. Account(s) are preferred to be government accounts of a similar size and nature.

Reference #4

Company:_____ Contact Person:_____

Phone #:_____ Email:_____

Project:_____ Dates of Service:_____

COMPANY BACKGROUND

Number of Years in Business:_____

Overview of Work History, Experience & Background of Company:

_____

_____

_____

_____

This document must be completed & returned with bid submission.