



**LEESBURG EXECUTIVE AIRPORT
NORTH HANGARS**

**BIDDING DOCUMENTS
SUPPLEMENTAL SPECIFICATIONS**

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

APRIL 15, 2021

**INVITATION FOR BID (IFB)
IFB NO. 19002-FY21-31**

NOTICE OF ADDENDA: Any addenda to this IFB will be posted on the Town's Bid Board (<http://www.leesburgva.gov/bidboard>) and will only be emailed to those firms who have REGISTERED on the Bid Board. It is the firm's responsibility to provide a correct email address and to be aware of any addenda.

TABLE OF CONTENTS

ADVERTISEMENT FOR BID	7
REQUIRED BID RESPONSE FORMS	8-26
Checklist	8
Bid Submission Form (Including Conflict of Interest and Collusion Certifications)	9-10
Acknowledgement of Addenda	11
Escrow of Retained Funds	12
Bid Bond.....	13-14
Qualification Form	15
Reference Form	16-17
Subcontractor Form.....	18
Certification of Nonsegregated Facilities	19
Trade Restriction Clause – CFR PART 30	20
Certification Regarding Debarment and Suspension	21
Buy American Preference.....	22-23
Tax Delinquency and Felony Convictions	24
Utilization Statement (Disadvantage Business Enterprise)	25
Letter of Intent (Disadvantage Business Enterprise).....	26
FEDERAL REQUIRED CONTRACT PROVISIONS FOR AIP PROGRAM.....	27-28
Important Notice	27
Disadvantaged Business Enterprise Requirements	27-28
INSTRUCTIONS TO BIDDERS	29-40
Background	29
Scope of Work.....	29
Comments Concerning Specifications (VPPA 2.2-4316).....	29-30
Incomplete Documents	30
Town of Leesburg Business Professional and Occupation License (BPOL).....	30
Form and Style of Bids	30-31
Bid Bond.....	31
Submission of Bids	31-32
Bid Additives.....	32
Modification/Withdrawal of Bid	32-33
Consideration of Bids & Bid Opening	33
Award	33-34
Negotiations with the Lowest Responsive Bidder	34
Qualifications of the Lowest Responsive Bidder	34
Protest.....	35
Acceptance of Bid (VPPA 2.2-4337)	35
SCC Identification Number (VPPA 2.2-4311.2)	35
Virginia Contractor’s License Number (Code of Virginia §54.1-1115, A1 and A6)	35
Stipulated Prices	35-36
Compensation and Payment.....	36

Coordination with Utilities.....	36
Contract Time.....	36
Trees	36
Contract Items of Work.....	37
Maintenance of Traffic for Activities Affecting Miller Drive.....	38
Steel/Iron Price Adjustment.....	39-40
TREE PROTECTION SPECIFICATIONS.....	41-44
Site Clearing, Demolition	41-42
Pruning Specifications	42-43
Construction Specifications	43-44
SAMPLE AGREEMENT	45-53
Sample Agreement	45-49
Sample Payment Bond.....	50-51
Sample Performance Bond	52-53
GENERAL CONDITIONS.....	GC-1 – GC-85
ARTICLE 1: CONTRACT DOCUMENTS	GC-2 – GC-5
1.1 DEFINITIONS	GC-2 – GC-3
1.2 EXECUTION, CORRELATION AND INTENT.....	GC-3 – GC-5
1.3 OWNERSHIP AND USE OF DOCUMENTS	GC-6
ARTICLE 2: OWNER'S PROJECT MANAGER.....	GC-6
2.1 DEFINITIONS	GC-6
2.2 SERVICES OF THE OWNER'S PROJECT MANAGER	GC-6
ARTICLE 3: OWNER.....	GC-7-GC-10
3.1 DEFINITIONS	GC-7
3.2 INFORMATION, SERVICES AND RIGHTS OF THE OWNER	GC-7
3.3 OWNER'S RIGHT TO STOP OR TO SUSPEND WORK	GC-7 – GC-8
3.4 OWNER'S RIGHT TO CARRY OUT THE WORK.....	GC-8 – GC-9
3.5 EXAMINATION OF RECORDS	GC-10
ARTICLE 4: CONTRACTOR	GC-11 – GC-35
4.1 DEFINITION	GC-11
4.2 REVIEW OF CONTRACT DOCUMENTS.....	GC-11
4.3 SUPERVISION AND CONSTRUCTION PROCEDURES	GC-11 – GC-12
4.4 INSPECTION OF CONSTRUCTION.....	GC-12
4.5 CONTRACTOR'S REPRESENTATIONS.....	GC-13 – GC-15
4.6 LABOR AND MATERIALS	GC-15 – GC-20
4.7 WARRANTY	GC-20 – GC-21
4.8 TAXES	GC-21 – GC-22
4.9 PERMITS, FEES AND NOTICES	GC-22
4.10 SUPERINTENDENT.....	GC-22 – GC-23
4.11 PROJECT SCHEDULES	GC-23 – GC-26

4.12	RESPONSIBILITY FOR COMPLETION	GC-26 – GC-27
4.13	DOCUMENTS, OTHER SUBMITTALS AT THE SITE; AS-BUILT DRAWINGS	GC-27
4.14	SHOP DRAWINGS, PRODUCT DATA, SAMPLES AND OTHER SUBMITTALS	GC-27 – GC-30
4.15	CUTTING AND PATCHING OF WORK	GC-30
4.16	DRUG FREE WORKPLACE	GC-30 – GC-31
4.17	NON-DISCRIMINATION IN EMPLOYMENT	GC-31
4.18	SIGNS	GC-31
4.19	CLEANING UP	GC-32
4.20	ROYALTIES AND PATENTS	GC-32
4.21	ANTI-TRUST	GC-33
4.22	INDEMNIFICATION	GC-33 – GC-34
4.23	PERSONS AUTHORIZED TO SIGN DOCUMENTS	GC-34
4.24	ASBESTOS	GC-34 – GC-35
4.25	RIGHT TO PUBLISH	GC-35
4.26	MATERIALS AND EQUIPMENT LIST	GC-35
ARTICLE 5: SUBCONTRACTORS		GC-36 – GC-38
5.1	DEFINITIONS	GC-36
5.2	AWARD OF SUBCONTRACTS AND OTHER CONTRACTS FOR PORTIONS OF THE WORK	GC-36 – GC-37
5.3	SUBCONTRACTUAL RELATIONS	GC-37
5.4	QUALIFICATION SUBMITTALS	GC-37 – GC-38
ARTICLE 6: WORK BY OWNER OR BY SEPARATE CONTRACTORS		GC-39 – GC-40
6.1	OWNER'S RIGHT TO PERFORM WORK AND TO AWARD SEPARATE CONTRACTS	GC-39
6.2	MUTUAL RESPONSIBILITY	GC-39
6.3	OWNER'S RIGHT TO PERFORM DISPUTED WORK	GC-40
6.4	COORDINATION OF THE WORK	GC-40
ARTICLE 7: MISCELLANEOUS PROVISIONS		GC-41 – GC-44
7.1	GOVERNING LAW	GC-41
7.2	SUCCESSORS AND ASSIGNS	GC-41
7.3	CLAIMS FOR DAMAGES	GC-42
7.4	DISPUTES	GC-42
7.5	TESTS	GC-43 – GC-44
7.6	UNENFORCEABILITY OF ANY PROVISION	GC-44
7.7	AVAILABILITY OF LANDS	GC-44
7.8	NONEXCLUSIVITY OF REMEDIES	GC-44
ARTICLE 8: TIME		GC-45 – GC-49
8.1	DEFINITIONS	GC-45
8.2	PROGRESS AND COMPLETION	GC-46
8.3	DELAYS AND EXTENSIONS OF TIME	GC-46 – GC-49

ARTICLE 9: PAYMENTS AND COMPLETION.....	GC-50 – GC-59
9.1 CONTRACT PRICE	GC-50
9.2 SCHEDULE OF VALUES	GC-50
9.3 APPLICATIONS FOR PAYMENT	GC-51 – GC-53
9.4 CERTIFICATES FOR PAYMENT	GC-53
9.5 PROGRESS PAYMENTS	GC-53 – GC-55
9.6 PAYMENTS WITHHELD	GC-55 – GC-56
9.7 SUBSTANTIAL COMPLETION.....	GC-56 – GC-57
9.8 FINAL COMPLETION AND FINAL PAYMENT.....	GC-57 – GC-59
9.9 PARTIAL OCCUPANCY OR USE	GC-59
ARTICLE 10: PROTECTION OF PERSONS AND PROPERTY	GC-60 – GC-63
10.1 SAFETY PRECAUTIONS AND PROGRAMS.....	GC-60
10.2 SAFETY OF PERSONS AND PROPERTY	GC-60 – GC-63
10.3 EMERGENCIES	GC-63
ARTICLE 11: BONDS AND INSURANCE	GC-64 – GC-68
11.1 BONDS	GC-64
11.2 CONTRACTOR'S LIABILITY INSURANCE	GC-65 – GC-67
11.3 WAIVERS OF SUBROGATION	GC-68
11.4 ADDITIONAL INSURANCE PROVISIONS.....	GC-68
ARTICLE 12: CHANGES IN THE WORK	GC-69 – GC-77
12.1 CHANGES IN THE WORK.....	GC-69
12.2 FIELD ORDER	GC-69
12.3 REQUEST FOR PROPOSAL.....	GC-69 – GC-70
12.4 PROPOSED CHANGE ORDER	GC-70
12.5 CHANGE ORDER	GC-71 – GC-73
12.6 UNILATERAL CHANGE ORDER	GC-73
12.7 DECREASES AND WORK NOT PERFORMED	GC-73 – GC-74
12.8 CHANGES IN LINE AND GRADE	GC-74 – GC-75
12.9 DIFFERING SITE CONDITIONS	GC-75
12.10 CLAIMS FOR ADDITIONAL COST AND/OR TIME.....	GC-76
12.11 ATTORNEYS' FEES AND OTHER EXPENSES	GC-76 – GC-77
ARTICLE 13: UNCOVERING AND CORRECTION OF WORK	GC-78 – GC-79
13.1 UNCOVERING OF WORK	GC-78
13.2 CORRECTION OF WORK	GC-78 – GC-79
13.3 ACCEPTANCE OF DEFECTIVE OR NON-CONFORMING WORK	GC-79
ARTICLE 14: TERMINATION OF THE CONTRACT	GC-80 – GC-85
14.1 TERMINATION FOR THE CONVENIENCE OF THE OWNER.....	GC-80
14.2 ALLOWABLE CONVENIENCE TERMINATION COSTS	GC-80 – GC-81
14.3 DEFAULT TERMINATION	GC-82 – GC-83
14.4 GENERAL TERMINATION PROVISIONS	GC-83 – GC-85

PROJECT GENERAL PROVISIONS

Section 10 Definition of Terms..... 10-1
Section 40 Scope of Work 40-1

PROJECT SPECIAL PROVISIONS

PSP Project Special Provisions.....PSP-1

TECHNICAL SPECIFICATIONS

Item B-101 Hangar Buildings General RequirementsB-101-1
Item C-100 Contractor Quality Control Program (CQCP).....C-100-1
Item C-102 Temporary Air & Water Pollution, Soil Erosion & Siltation ControlC-102-1
Item C-105 Mobilization.....C-105-1
Item C-110 Method of Estimating Percentage of
Material Within Specification Limits (PWL)C-110-1
Item D-701 Pipe for Storm Drains and CulvertsD-701-1
Item D-751 Manholes, Catch Basins, Inlets, and Inspection Holes.....D-751-1
Item D-752 Concrete Culverts, Headwalls,
and Miscellaneous Drainage StructuresD-752-1
Item F-162 Chain-Link Fences F-162-1
Item L-110 Airport Underground Electrical Duct L-110-1
Item M-104 Traffic DrumsM-104-1
Item M-107 Low Profile Aviation BarricadesM-107-1
Item P-152 Excavation and Embankment..... P-152-1
Item P-209 Crushed Aggregate Base Course..... P-209-1
Item P-602 Emulsified Asphalt Prime Coat..... P-602-1
Item P-603 Bituminous Tack Coat P-603-1
Item P-610 Structural Portland Cement Concrete P-610-1
Item P-620 Runway and Taxiway Painting P-620-1
Item P-630 Refined Coal Tar Emulsion without Additives, Slurry
Seal Surface Treatment P-630-1
Item T-901 Seeding..... T-901-1
Item T-905 Topsoiling T-905-1
Item T-908 Mulching..... T-908-1
Item VA-315 Asphalt Concrete Placement VA-315-1
Item VA-504 Sidewalks, Steps, and Handrails VA-504-1
Item VA-701 Traffic Signs VA-701-1

Appendix A Construction Safety and Phasing Plan G-1

Appendix B Safety Inspection ChecklistI-1

Appendix C Geotechnical Data J-1

eVA New Vendor Registration Guide 1-7

eVA Electronic Bid Submission Guide for IFBs 1-3

END OF TABLE OF CONTENTS

**TOWN OF LEESBURG
ADVERTISEMENT FOR BID**

**IFB NO. 19002-FY21-31
LEESBURG EXECUTIVE AIRPORT
NORTH HANGARS**

****NOTE: The Town of Leesburg has implemented revised procurement procedures during the COVID-19 State of Emergency. Effective January 1, 2021, and for the duration of the Emergency or until further notice, all bids and proposals in response to a formal solicitation issued by the Town will be securely received via eVA, the Commonwealth's eProcurement website. Additionally, during this time the Town will not conduct in-person public bid openings. ****

SEALED BIDS to construct the above project WILL BE RECEIVED by the Town of Leesburg, electronically via the Commonwealth's e-procurement website (www.eva.virginia.gov), **UNTIL BUT NO LATER THAN 3:00 P.M. ON THURSDAY, MAY 13, 2021.** Bids shall be submitted electronically using the following naming convention: the IFB number and the name of the bidder (i.e. "IFB No. 19002-FY21-31_Your Company's Name").

A non-mandatory pre-bid meeting will be held on Thursday, April 22, 2021 at 10:00 a.m. via Cisco Webex. Cisco Webex conferencing information, including instructions to join the meeting via computer and/or phone, will be available from the Town's Bid Board.

All questions regarding this bid must be submitted in writing via email to CapitalBidQuestions@leesburgva.gov until but no later than 5:00 P.M. on Tuesday, April 27, 2021.

Bids will be publicly opened via Cisco Webex using the eVA e-Procurement website at the due date and time listed above. The bid opening will be livestreamed via Cisco Webex and made available to the public. Cisco Webex conferencing information will be available, including instructions to join the meeting via computer and/or phone, from the Town's Bid Board.

Work includes excavation, storm drainage, grading, miscellaneous site work and pre-engineered metal building construction, and all incidentals related thereto. The Town reserves the right to perform all, part, or none of the work.

Bid Documents are available for download from the Town's Bid Board at <http://www.leesburgva.gov/bidboard>. **Any addenda issued for this project will be posted on the Town's Bid Board and eVA (<https://eva.virginia.gov>) with a courtesy email to those firms who have registered on the Town's Bid Board. It is the bidders' responsibility to provide a correct email address and to be aware of any addenda.**

Bud Siegel, P.E., Acting Manager
Office of Capital Projects



REQUIRED BID RESPONSE FORMS
IFB NO. 19002-FY21-31
LEESBURG EXECUTIVE AIRPORT
NORTH HANGARS

Bidders shall submit bids to the Town in accordance with the Submission of Bids section of the Bid Documents and shall include the following completed documents with their bid submission:

Checklist

- _____ **Bid Submission Form (includes Conflict of Interest and Collusion Certifications)**
- _____ **Acknowledgement of Addenda**
- _____ **Bid Form – Pricing ** SUBMITTED ELECTRONICALLY VIA EVA****
- _____ **Escrow of Retained Funds**
- _____ **Bid Bond ** The original bid security shall be delivered to the Town within two (2) business days after the bids are due to the Town. See the Bid Bond section of the Bid Documents for details and instructions. ****
- _____ **Qualification Form**
- _____ **Reference Form**
- _____ **Subcontractor Plan**
- _____ **Federal Required Contract Provisions for AIP Program:**
- _____ **Certification of Nonsegregated Facilities**
- _____ **Trade Restriction Clause - CFR PART 30**
- _____ **Certification Regarding Debarment and Suspension (Non-Procurement)**
- _____ **Buy American Preference**
- _____ **Certification of Offerer/Bidder Regarding Tax Delinquency and Felony Convictions**
- _____ **Disadvantaged Business Enterprise Requirements:**
- _____ **Utilization Statement - Disadvantage Business Enterprise**
- _____ **Letter of Intent - Disadvantage Business Enterprise (Each DBE Firm)**

Bidders shall use the required bid response forms included in the Bid Documents when submitting their bid to the Town. Bidders who do not provide all required bid response forms may be deemed non-responsive.



BID SUBMISSION FORM
IFB NO. 19002-FY21-31
LEESBURG EXECUTIVE AIRPORT
NORTH HANGARS

SUBMIT A SIGNED BID FORM VIA EVA, WWW.EVA.VIRGINIA.GOV

**FORMAL BIDS WILL BE DUE NO LATER THAN:
3:00 P.M. ON THURSDAY, MAY 13, 2021**

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

SECTION I – COMPANY IDENTIFICATION AND OWNERSHIP DISCLOSURE

Company _____

Address _____

Contact Person _____ Title _____

Telephone No. _____ Fax No. _____

Email _____

Business Type (check one):

Corporation Limited Partnership Limited Liability Company

General Partnership Unincorporated Assoc. Sole Proprietorship

Organized under the laws of the State of _____

State Corp. Commission Registration No. _____ (attach Certificate of Good Standing)

Virginia Contractor's License No. _____

Federal Identification No. _____

The Town of Leesburg requests, as a matter of policy, that any bidder receiving a contract of award resulting from a formal solicitation issued by the Town shall make certification as specified below. Receipt of such certification, shall be a prerequisite to the award of contract and payment thereof.

SECTION II – EMPLOYEES NOT TO BENEFIT - I (we) hereby certify that if the contract is awarded to our company, partnership, or corporation, that no employee of the Town of Leesburg, or members of his/her immediate family, including spouse, parents or children has received or been promised, directly or indirectly, any financial benefit, by way of fee, commission, finder’s fee, political contribution or any similar form of remuneration on account of the act of awarding and/or executing this contract.

SECTION III – CONFLICTS OF INTEREST - This solicitation is subject to the provisions of VA Code Ann. Section 2.1-639.2 et seq., the State and Local Government Conflict of Interests Act. **The Bidder [] is [] is not aware of any information bearing on the existence of any potential organizational conflict of interest.**

SECTION IV – COLLUSION - I certify that this offer is made without prior understanding, agreement, or connection with any corporation, firm, or person submitting an offer for the same services, materials, supplies, or equipment and is in all respects fair and without collusion or fraud. I understand collusive bidding is a violation of the State and federal law and can result in fines, prison sentences, and civil damage awards. I hereby certify that the responses to the above representations, certifications, and other statements are accurate and complete. I agree to abide by all conditions of this IFB and certify that I am authorized to sign for my company.

Signature _____

Date _____

Name (Printed) _____

Title _____

BIDDER MUST RETURN THIS FORM WITH THEIR BID



**ACKNOWLEDGEMENT OF ADDENDA
IFB NO. 19002-FY21-31
LEESBURG EXECUTIVE AIRPORT
NORTH HANGARS**

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

Addendum No. _____
Addendum No. _____
Addendum No. _____
Addendum No. _____

Dated: _____
Dated: _____
Dated: _____
Dated: _____

BIDDER MUST RETURN THIS FORM WITH THEIR BID

ESCROW OF RETAINED FUNDS

In accordance with Section 2.2-4334 of the Virginia Public Procurement Act (VPPA), any Contract valued at \$200,000.00 or more for construction of highways, roads, streets, bridges, parking lots, demolition, clearing, grading, excavating, paving, pile driving miscellaneous drainage structures, and the installation of water, gas, sewer lines and pumping stations where portions of the Contract price are to be retained, at the time of submitting a bid, the CONTRACTOR shall have the option to indicate preference for using the escrow account procedure for utilization of the Town retained funds by so indicating in the space provided in the proposal documents. In the event the successful Contract elects to use the escrow account procedure, the "Escrow Agreement" included in the Contract documents shall be executed and submitted to the Manager, Office of Capital Projects within 15 days after receipt of the Notice to Award. If the "Escrow Agreement" form is not submitted, the CONTRACTOR shall forfeit his rights to the use of the escrow account procedure within the 15-day period.

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

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

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

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

BIDDER MUST RETURN THIS FORM WITH THEIR BID

BID BOND

BOND NO. _____

AMOUNT: \$ _____

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

THE CONDITION OF THIS BOND IS SUCH THAT:

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

NOW THEREFORE,

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

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

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

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

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

PRINCIPAL

By _____

SURETY

By _____
Attorney-In-Fact

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

BIDDER MUST RETURN THIS FORM WITH THEIR BID

QUALIFICATION FORM

Note: Please refer to the QUALIFICATIONS OF THE LOWEST BIDDER SECTION of the Bid Documents. The following information is required as part of your response to this solicitation. Failure to complete and provide this form with your bid response may result in the Town deeming your bid as non-responsive.

1. Qualification: Bidder must have the capability and capacity in all respects to satisfy fully all of the contractual requirements.

2. Years in Business: Indicate the length of time you have been in business providing this type of good or service:

Years: _____ Months: _____

3. Contractor's Primary Contact(s) for this project:

Project Manager: _____ Email: _____ Phone: _____

Superintendent: _____ Email: _____ Phone: _____

Other (list title): _____ Email: _____ Phone: _____

4. Indicate below a listing of at least three (3) projects of similar size and scope within the past ten (10) years for which both the Project Manager and Superintendent specified and assigned for this project have successfully worked. Include reference contact information (name, email, and phone number), a description of work performed, the dates of service, and the contract value of the referenced project.

Company (Owner): _____ Contact: _____

Phone: (____) _____ Email Address: _____

Project Description: _____

Dates of Service: _____ Value (\$): _____

Company (Owner): _____ Contact: _____

Phone: (____) _____ Email Address: _____

Project Description: _____

Dates of Service: _____ Value (\$): _____

Company (Owner): _____ Contact: _____

Phone: (____) _____ Email Address: _____

Project Description: _____

Dates of Service: _____ Value (\$): _____

BIDDER MUST RETURN THIS FORM WITH THEIR BID

REFERENCE FORM

Note: Please refer to the *QUALIFICATIONS OF THE LOWEST BIDDER SECTION* of the Bid Documents. Indicate below a listing of at least three (3) current or recent municipal clients for whom the Contractor has performed and completed this type of work. Include reference contact information (email and phone number), a short description of work performed, the dates of service, and the name, email address, and telephone number of the point of contact.

Reference No. 1 (Required):

Customer (Owner) Representative's Name

Description of Work Performed & Dates of Service

Representative's Name	Phone Number	Email Address
-----------------------	--------------	---------------

Reference No. 2 (Required):

Customer (Owner) Representative's Name

Description of Work Performed & Dates of Service

Representative's Name	Phone Number	Email Address
-----------------------	--------------	---------------

Reference No. 3 (Required):

Customer (Owner) Representative's Name

Description of Work Performed & Dates of Service

Representative's Name	Phone Number	Email Address
-----------------------	--------------	---------------

Reference No. 4 (Optional):

Customer (Owner) Representative's Name

Description of Work Performed & Dates of Service

Representative's Name

Phone Number

Email Address

Reference No. 5 (Optional):

Customer (Owner) Representative's Name

Description of Work Performed & Dates of Service

Representative's Name

Phone Number

Email Address

BIDDER MUST RETURN THIS FORM WITH THEIR BID

SUBCONTRACTOR FORM

Note: Please note QUALIFICATIONS OF THE LOWEST BIDDER SECTION of the Bid Documents. The following information is required as part of your response to this solicitation. Failure to complete and provide this form with your bid response may result in the Town deeming your bid as non-responsive.

If you are NOT using any subcontractor(s), please initial here _____

If you are using subcontractor(s), please list them in the following table:

<i>Subcontractor(s) Name & Address</i>	<i>Contact Name, Email Address, & Phone Number</i>	<i>Type of Work to Be Performed</i>	<i>Percentage of Work</i>

I/We agree that the information provided herein is accurate, current, and complete to the best of my/our knowledge.

Signature: _____

Title of Company Official: _____

Date: _____

BIDDER MUST RETURN THIS FORM WITH THEIR BID

CERTIFICATION OF NONSEGREGATED FACILITIES

The federally-assisted construction contractor certifies that he does not maintain or provide, for his employees, any segregated facilities at any of his establishments and that he does not permit his employees to perform their services at any location, under his control, where segregated facilities are maintained. The federally-assisted construction contractor certifies that he will not maintain or provide, for his employees, segregated facilities at any of his establishments and that he will not permit his employees to perform their services at any location under his control where segregated facilities are maintained. The federally-assisted construction contractor agrees that a breach of this certification is a violation of the Equal Opportunity Clause in this Contract.

As used in this certification, the term "segregated facilities" means any waiting rooms, work areas, restrooms, and washrooms, restaurants and other eating areas, timeclocks, locker rooms and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing facilities provided for employees which are segregated on the basis of race, color, religion, or national origin because of habit, local custom, or any other reason. The federally assisted construction contractor agrees that (except where he has obtained identical certifications from proposed subcontractors for specific time periods) he will obtain identical certifications from proposed subcontractors prior to the award of subcontracts exceeding \$10,000 which are not exempt from the provisions of the Equal Opportunity Clause and that he will retain such certifications in his files.

Signature of Contractor

Date

Title

NOTE: The penalty for making false statements in offers is prescribed in 18 U.S. C. 1001.

BIDDER MUST RETURN THIS FORM WITH THEIR BID

**TRADE RESTRICTION CLAUSE - CFR PART 30
(VERSION 1, 1/5/90)**

The Contractor or subcontractor, by submission of an offer and/or execution of a contract, certifies that it:

- a. is not owned or controlled by one or more citizens of a foreign country included in the list of countries that discriminate against U.S. firms published by the Office of the United States Trade Representative (USTR);
- b. has not knowingly entered into any contract or subcontract for this project with a person that is a citizen or national of a foreign country on said list, or is owned or controlled directly or indirectly by one or more citizens or nationals of a foreign country on said list;
- c. has not procured any product nor subcontracted for the supply of any product for use on the project that is produced in a foreign country on said list.

Unless the restrictions of this clause are waived by the Secretary of Transportation, in accordance with 49 CFR 30.17, no contract shall be awarded to a Contractor or subcontractor who is unable to certify to the above. If the Contractor knowingly procures or subcontracts for the supply of any product or service of a foreign country on said list for use on the project, the Federal Aviation Administration may direct, through the Sponsor, cancellation of the Contract at no cost to the Government.

Further, the Contractor agrees that, if awarded a contract resulting from this solicitation, it will incorporate this provision for certification without modification in each contract and in all lower-tier subcontracts. The Contractor may rely on the certification of a prospective subcontractor unless it has knowledge that the certification is erroneous.

The Contractor shall provide immediate written notice to the sponsor if the Contractor learns that its certification or that of a subcontractor was erroneous when submitted or has become erroneous by reason of changed circumstances. The subcontractor agrees to provide written notice to the Contractor if at any time it learns that its certification was erroneous by reason of changed circumstances.

This certification is a material representation of fact upon which reliance was placed when making the award. If it is later determined that the Contractor or subcontractor knowingly rendered an erroneous certification, the Federal Aviation Administration may direct, through the Sponsor, cancellation of the Contract or subcontract for default at no cost to the Government.

This certification concerns a matter within the jurisdiction of an agency of the United States of America and the making of a false, fictitious, or fraudulent certification may render the maker subject to prosecution under Title 18, United States Code, Section 1001.

Signature of Contractor

Date

Title

BIDDER MUST RETURN THIS FORM WITH THEIR BID

**CERTIFICATION REGARDING DEBARMENT AND SUSPENSION
(NON-PROCUREMENT) - REVISED 5/14/2013**

Certification Regarding Debarment and Suspension (Non-Procurement) – Title 2 CFR Part 180 & Title 2 CFR Part 1200

The contract agreement that ultimately results from this solicitation is a “covered transaction” as defined by Title 2 CFR Part 180. Bidder must certify at the time they submit their bid that neither it nor its principals are presently debarred or suspended by any Federal department or agency from participation in this transaction. The bidder with the successful bid further agrees to comply with Title 2 CFR Part 1200 and Title 2 CFR Part 180, Subpart C by administering each lower tier subcontract that exceeds \$25,000 as a “covered transaction”.

Certification Regarding Debarment and Suspension (Non-Procurement) – Title 2 CFR Part 1200 and Title 2 CFR Part 180, Subpart C

The successful bidder by administering each lower tier subcontract that exceeds \$25,000 as a “covered transaction” must verify each lower tier participant of a “covered transaction” under the project is not presently debarred or otherwise disqualified from participation in this federally assisted project. The successful bidder shall accomplish this by:

- i. Checking the System for Award Management at website: <http://www.sam.gov>
- ii. Collecting a certification statement similar to paragraph a.
- iii. Inserting a clause or condition in the covered transaction with the lower tier contract

If the FAA later determines that an individual failed to tell a higher tier that they were excluded or disqualified at the time they entered the covered transaction with that person, the FAA may pursue any available remedy, including suspension and debarment.

Reference

Title 2 CFR Part 180 (Subpart C)

Title 2 CFR Part 1200

DOT Order 4200.5 DOT Suspension & Debarment Procedures & Ineligibility

The bidder offers, by submission of this bid, that the above certifications are met.

Signature of Contractor

Date

Title

BIDDER MUST RETURN THIS FORM WITH THEIR BID

BUY AMERICAN PREFERENCE

The Contractor agrees to comply with 49 USC § 50101, which provides that Federal funds may not be obligated unless all steel and manufactured goods used in AIP funded projects are produced in the United States, unless the FAA has issued a waiver for the product; the product is listed as an Excepted Article, Material or Supply in Federal Acquisition Regulation subpart 25.108; or is included in the FAA Nationwide Buy American Waivers Issued list.

A bidder or offeror must complete and submit the Buy America certification included herein with their bid or offer. The Owner will reject as nonresponsive any bid or offer that does not include a completed Certificate of Buy American Compliance.

CERTIFICATE OF BUY AMERICAN COMPLIANCE – MANUFACTURED PRODUCT

As a matter of bid responsiveness, the bidder or offeror must complete, sign, date, and submit this certification statement with their bid. The bidder or offeror must indicate how they intend to comply with 49 USC § 50101 by selecting one on the following certification statements. These statements are mutually exclusive. Bidder must select one or the other (not both) by inserting a checkmark (✓) or the letter “X”.

- Bidder or offeror hereby certifies that it will comply with 49 USC § 50101 by:
 - a) Only installing steel and manufactured products produced in the United States, or;
 - b) Installing manufactured products for which the FAA has issued a waiver as indicated by inclusion on the current FAA Nationwide Buy American Waivers Issued listing, or;
 - c) Installing products listed as an Excepted Article, Material or Supply in Federal Acquisition Regulation Subpart 25.108.

By selecting this certification statement, the bidder or offeror agrees:

1. To provide to the Owner evidence that documents the source and origin of the steel and manufactured product.
2. To faithfully comply with providing US domestic product
3. To furnish US domestic product for any waiver request that the FAA rejects
4. To refrain from seeking a waiver request after establishment of the contract, unless extenuating circumstances emerge that the FAA determines justified.

- The bidder or offeror hereby certifies it cannot comply with the 100% Buy American Preferences of 49 USC § 50101(a) but may qualify for either a Type 3 or Type 4 waiver under 49 USC § 50101(b). By selecting this certification statement, the apparent bidder or offeror with the apparent low bid agrees:

1. To submit to the Owner within 15 calendar days of the bid opening, a formal waiver request and required documentation that support the type of waiver being requested.

2. That failure to submit the required documentation within the specified timeframe is cause for a non-responsive determination may result in rejection of the bid.
3. To faithfully comply with providing US domestic products at or above the approved US domestic content percentage as approved by the FAA.
4. To refrain from seeking a waiver request after establishment of the contract, unless extenuating circumstances emerge that the FAA determines justified.

Required Documentation

Type 3 Waiver - The cost of the item components and subcomponents produced in the United States is more that 60% of the cost of all components and subcomponents of the “item”. The required documentation for a type 3 waiver is:

- a) Listing of all product components and subcomponents that are not comprised of 100% US domestic content (Excludes products listed on the FAA Nationwide Buy American Waivers Issued listing and products excluded by Federal Acquisition Regulation Subpart 25.108; products of unknown origin must be considered as non-domestic products in their entirety).
- b) Cost of non-domestic components and subcomponents, excluding labor costs associated with final assembly at place of manufacture.
- c) Percentage of non-domestic component and subcomponent cost as compared to total “item” component and subcomponent costs, excluding labor costs associated with final assembly at place of manufacture.

Type 4 Waiver – Total cost of project using US domestic source product exceeds the total project cost using non-domestic product by 25%. The required documentation for a type 4 of waiver is:

- a) Detailed cost information for total project using US domestic product
- b) Detailed cost information for total project using non-domestic product

False Statements: Per 49 USC § 47126, this certification concerns a matter within the jurisdiction of the Federal Aviation Administration and the making of a false, fictitious or fraudulent certification may render the maker subject to prosecution under Title 18, United States Code.

Date

Signature

Company Name

Title

BIDDER MUST RETURN THIS FORM WITH THEIR BID

**CERTIFICATION OF OFFERER/BIDDER REGARDING
TAX DELINQUENCY AND FELONY CONVICTIONS**

The applicant must complete the following two certification statements. The applicant must indicate its current status as it relates to tax delinquency and felony conviction by inserting a checkmark (✓) in the space following the applicable response. The applicant agrees that, if awarded a contract resulting from this solicitation, it will incorporate this provision for certification in all lower tier subcontracts.

Certifications

- 1) The applicant represents that it is (____) is not (____) a corporation that has any unpaid Federal tax liability that has been assessed, for which all judicial and administrative remedies have been exhausted or have lapsed, and that is not being paid in a timely manner pursuant to an agreement with the authority responsible for collecting the tax liability.
- 2) The applicant represents that it is (____) is not (____) a corporation that was convicted of a criminal violation under any Federal law within the preceding 24 months.

Note

If an applicant responds in the affirmative to either of the above representations, the applicant is ineligible to receive an award unless the sponsor has received notification from the agency suspension and debarment official (SDO) that the SDO has considered suspension or debarment and determined that further action is not required to protect the Government’s interests. The applicant therefore must provide information to the owner about its tax liability or conviction to the Owner, who will then notify the FAA Airports District Office, which will then notify the agency’s SDO to facilitate completion of the required considerations before award decisions are made.

Term Definitions

Felony conviction: Felony conviction means a conviction within the preceding twenty-four (24) months of a felony criminal violation under any Federal law and includes conviction of an offense defined in a section of the U.S. code that specifically classifies the offense as a felony and conviction of an offense that is classified as a felony under 18 U.S.C. § 3559.

Tax Delinquency: A tax delinquency is any unpaid Federal tax liability that has been assessed, for which all judicial and administrative remedies have been exhausted, or have lapsed, and that is not being paid in a timely manner pursuant to an agreement with the authority responsible for collecting the tax liability.

Date

Signature

Company Name

Title

BIDDER MUST RETURN THIS FORM WITH THEIR BID

**UTILIZATION STATEMENT
Disadvantage Business Enterprise**

The undersigned bidder/offeror has satisfied the requirements of the bid specification in the following manner. *(Please mark the appropriate box)*

- The bidder/offeror is committed to a minimum of 11.34% DBE utilization on this contract.
- The bidder/offeror, while unable to meet the DBE goal of 11.34%, hereby commits to a minimum of _____% DBE utilization on this contract and also submits documentation, as an attachment demonstrating good faith efforts (GFE).

The undersigned hereby further assures that the information included herein is true and correct, and that the DBE firm(s) listed herein have agreed to perform a commercially useful function in the work items noted for each firm. The undersigned further understands that no changes to this statement may be made without prior approval from the Civil Right Staff of the Federal Aviation Administration.

Bidder's/Offeror's Firm Name

Signature

Date

DBE Utilization Summary

<u>Percentage</u>	<u>Contract Amount</u>	<u>DBE Amount</u>	<u>Contract</u>
DBE Prime Contractor	\$ _____ x 1.00=	\$ _____	_____ %
DBE Subcontractor	\$ _____ x 1.00=	\$ _____	_____ %
Total Amount DBE		\$ _____	_____ %
DBE Goal		\$ _____	_____ %

*If the total proposed DBE participation is less than the established DBE goal, Bidder must provide written documentation of the good faith efforts as required by 49 CFR Part 26.

BIDDER MUST RETURN THIS FORM WITH THEIR BID

LETTER OF INTENT
Disadvantage Business Enterprise
(This page shall be submitted for each DBE firm)

Bidder/Offer Name: _____
Address: _____
City: _____ State: _____ Zip: _____

DBE Firm: DBE Firm: _____
Address: _____
City: _____ State: _____ Zip: _____

DBE Contact Person Name: _____ Phone: (____) _____

DBE Certifying Agency: _____ Expiration Date: _____
Each DBE Firm shall submit evidence (such as a photocopy) of their certification status.

Classification: Prime Contractor Subcontractor

Work item(s) to be performed by DBE	Description of Work Item	Quantity	Total

The bidder/offeror is committed to utilizing the above-named DBE firm for the work described above. The estimated participation is as follows:

DBE contract amount: \$ _____ Percent of total contract: _____ %

AFFIRMATION:

The above-named DBE firm affirms that it will perform the portion of the contract for the estimated value as state above.

By: _____
(Signature) *(Title)*

*In the event the bidder/offeror does not receive award of the prime contract, any and all representation in this Letter of Intent and Affirmation shall be null and void.

BIDDER MUST RETURN THIS FORM WITH THEIR BID

FEDERAL REQUIRED CONTRACT PROVISIONS FOR AIP PROGRAM

IMPORTANT NOTICE

The Contractor's attention is directed to the Disadvantaged Business Enterprise Statements and Requirements, and the Equal Employment Opportunity Requirements **which must be submitted with the bid.**

Contract award will be made on the basis of the lowest responsive qualified bidder for the respective alternate.

The bidder understands that the entirety of the Federal Required Contract Provisions for AIP Program shall be considered a part of the Bid, and that when notified the low bidder(s), shall submit the information required, hereinafter related to Equal Opportunity Requirements, within ten (10) days of such notification.

The Bidder is aware of subcontract requirements to obtain the goal of **11.34%** of Disadvantaged Business participation established for this contract; has completed and is submitting, along with the bid, required information (see "Disadvantaged Business Enterprise Program") describing actions taken in order to achieve such goals; and understands that meeting or exceeding the stated goals is a condition for being awarded this contract.

Failure to submit the above information may be grounds for rejection of the bid.

Wages not less than the minimum rates of wages, as predetermined for this project by the Secretary of Labor, shall be used in the preparation of this Bid.

DISADVANTAGED BUSINESS ENTERPRISE REQUIREMENTS

Disadvantaged Business Enterprise Requirements (DBE) are applicable to each general aviation airport sponsor receiving grant funds in excess of \$250,000; each non-hub airport sponsor (including commuters) receiving grant funds in excess of \$400,000; each large, medium, small hub airport sponsor receiving a grant in excess of \$500,000.

Since the contract to be awarded under this advertised bid falls into the above category, the bid is subject to the following DBE requirements:

1. The successful bidder shall make a good faith effort to use DBE subcontractors and to replace a DBE subcontractor that is unable to perform successfully with another DBE subcontractor. There shall be no substitution of any subcontractors without the prior approval of the sponsor in order to ensure that the substitute firm is an eligible DBE.
2. The bidder shall make good faith efforts, as defined in Appendix A of 49 CFR Part 26, Regulations of the Office of the Secretary of Transportation, to subcontract **11.34%** of the dollar value of the prime contract to small business concerns owned and controlled by socially and economically disadvantaged individuals (DBE). In the event that the bidder for this solicitation

qualifies as a DBE, the contract goal shall be deemed to have been met. Individuals who are rebuttably presumed to be socially and economically disadvantaged include women, Blacks, Hispanics, Native Americans, Asian-Pacific Americans, and Asian-Indian Americans. **The bidder is required to submit information concerning the DBEs, along with this bid,** that will participate in this contract. The information will include the name and address of each DBE, a description of the work to be performed by each named firm, and the dollar value of the contract. If the bidder fails to achieve the contract goal stated herein, it will be required to provide documentation demonstrating that it made good faith efforts in attempting to do so. A bidder that fails to meet these requirements will be considered nonresponsive. **Forms for the bidder's use are included on Pages 25 and 26.**

3. The successful bidder shall establish and maintain records and submit reports, as required, which will identify and assess the efforts made to achieve DBE subcontract goals and other DBE affirmative action efforts.

INSTRUCTIONS TO BIDDERS

BACKGROUND

The Leesburg Executive Airport has been assigned the role of General Aviation Reliever facility for Dulles International Airport by the Virginia Air Transportation System Plan and the FAA's National Plan of Integrated Airport Systems (NPIAS). The FAA has assigned the Airport Reference Code of C-II. These airport classifications define the role that the Airport plays in the Virginia system and the type of aircraft that the airport will be planned and designed to accommodate. The airport draws its activity from the Northern Virginia area, and utilization is by all categories of general aviation aircraft from single-engine piston to corporate jets.

The project site is in an undeveloped portion on the northern end of the airport. The topography ranges from a high of approximately EL. 390+ feet in the eastern side of the site and a low of approximately EL. 380+ feet in the western side of the site. The site is basically undeveloped with minor earthwork being performed sometime in early 2000. The development of this site is critical to the future development of the airport as the construction of these hangars and tie downs will house displaced aircraft once the airport's parallel runway is shifted to meet current FAA standards.

This construction is expected to begin in the Fall of 2021 and be completed in 2023.

SCOPE OF WORK

The Town of Leesburg, Virginia (Town) is requesting sealed bids from qualified Bidders to provide site and building construction services for the Leesburg Executive Airport North Hangars project.

The successful bidder, also referred to herein as "Contractor", shall provide site and building construction services including, but not limited to, installation of erosion and sediment control measures, storm sewer, water line, sewer line (gravity and force main), sewer grinder pump station, underground stormwater detention facility, retaining wall, concrete sidewalk, chain-link fencing, pavement structure (stone & asphalt), and pavement marking. Also, design and construct a pre-manufactured corporate hangar building (3- 60x60'unit) and a 26-unit T-hangar including bathroom facilities in the T-hangar only. All incidentals shall be included that are necessary to complete the work provided in the construction documents.

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

COMMENTS CONCERNING SPECIFICATIONS (VPPA 2.2-4316)

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

If any questions or responses require revisions to the solicitation as originally published, such revisions will be by formal addendum only. Bidders are cautioned that any written or oral

representations made by any Town representative or other person that appear to change materially any portion of the solicitation shall not be relied upon unless subsequently ratified by a written addendum to this solicitation issued by the Office of Capital Projects. For determination as to whether an oral or written representation of any Town representative or other person requires that an addendum be issued, contact the Manager, Office of Capital Projects in writing via email at CapitalBidQuestions@leesburgva.gov.

INCOMPLETE DOCUMENTS

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

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

TOWN OF LEESBURG BUSINESS PROFESSIONAL AND OCCUPATION LICENSE (BPOL)

Bidders do not have to obtain a BPOL license in order to submit a bid to the Town; however, the successful bidder must obtain a license, if applicable, prior to award of the contract.

The successful bidder must comply with the provisions of Section 20-233 (License requirement) of the Town of Leesburg Code, if applicable. For information on the provisions of this chapter and its applicability to this Contract, contact the Town of Leesburg Accounting Associate, Finance Department, Town of Leesburg, Virginia, at telephone number 703-771-2753 or email BusinessLic@leesburgva.gov.

FORM AND STYLE OF BIDS

NOTE: THIS SECTION CONTAINS REVISED PROCUREMENT PROCEDURES

Bids shall be submitted electronically via the Commonwealth's electronic procurement website (eVA). Unless otherwise specified or permitted herein, prices shall be submitted on all line items shown in eVA. In addition to submitting bid pricing electronically via eVA, bidder shall also upload all completed bid response forms as required by the Town with their Bid.

Bids shall include the legal name of the Bidder and a statement that the Bidder is a sole proprietor, partnership, corporation, or other legal entity. Bids shall be signed by the person or persons legally authorized to bind the Bidder to a contract. During the COVID-19 State of Emergency, and for the duration of the Emergency or until further notice, electronic signatures will be accepted by the Town; submission of a bid through the eVa system constitutes your representation that your firm authorizes the use of electronic signatures. A Bid by a corporation shall further give the state of

incorporation and have the corporate seal affixed. All names shall be typed or printed in ink below the signatures. The address, phone number and email address for communication regarding the bid shall be shown.

Bids shall contain evidence of the Bidder's authority to do business in the Commonwealth of Virginia. Bidder's Virginia State Contractor license number shall also be shown on the Bid Response Form.

BID BOND

NOTE: THIS SECTION CONTAINS REVISED PROCUREMENT PROCEDURES

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

The original bid security shall be delivered to the Town within two (2) business days after the bids are due to the Town. The original bid security shall be mailed to: Town of Leesburg, Virginia, Attn: Procurement Office, 25 W. Market Street, Leesburg, VA 20176. The Town reserves the right to deem bidders non-responsive for failure to provide the original bid security within the timeframe specified.

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

SUBMISSION OF BIDS

NOTE: THIS SECTION CONTAINS REVISED PROCUREMENT PROCEDURES

In order to be considered for a contract award, bidders must complete and submit a response to this IFB via the Commonwealth's electronic procurement website eVA (www.eva.virginia.gov). eVA streamlines and automates government purchasing activities in the Commonwealth. The eVA portal is the gateway for vendors to conduct business with state agencies and public bodies. Bidders desiring to provide goods and/or services to the Town must be a registered vendor in eVA. eVA Vendor Registration is free.

On the eVA website, www.eva.virginia.gov, applicants must login as a vendor using their eVA username and password. Please contact eVA Customer Care for instructions and/or assistance in registering to become a vendor, login, and/or uploading documents. eVA Customer Care:

Hours: 8:00 AM to 4:45 PM, Monday through Friday
Phone Toll Free: 866-289-7367
Email: eVACustomerCare@DGS.Virginia.gov

Guides for registering as a new vendor and submitting bids on eVA are included at the end of this bid document.

Bids shall be submitted electronically to the Town via the Commonwealth's eVA website **prior** to the bid submission deadline stipulated for this IFB or as amended via any subsequent addenda issued by the Town. Bidders assume full responsibility for the electronic delivery of the completed proposal to www.eva.virginia.gov on or before the deadline for submission. The Town is not responsible for any loss or delay with respect to the submission of bids. Late bids will **not** be accepted. Bids submitted by any method other than via the eVA website will **not** be accepted.

All required forms and documentation submitted in response to this IFB must be uploaded as one (1) pdf attachment to eVA (www.eva.virginia.gov). The attachment should use the following naming convention: the IFB number and the name of the bidder (i.e. IFB No. XXXXX-FYXX-XX - Your Company's Name).

NOTE: eVA will not allow a bidder to upload documents after the deadline set for receipt of bids. Any submission partially uploaded at the deadline date and time will be considered incomplete and will not be accepted. ANY BID RECEIVED BY THE TOWN AFTER THE DEADLINE FOR SUBMISSION WILL NOT BE ACCEPTED.

BID ADDITIVES

This IFB includes bid additives. Bid additives represent an additional cost to the Town to incorporate additional work not included in the Total Base Bid. Each bid additive shall be independent of the other bid additives and is intended to stand on its own and be priced as such. The additives are listed sequentially with the most essential bid additive listed first and in the order in which they shall be added to the contract up to but not exceeding the Town's available funding for the project. Decision to include each bid additive in whole or in part shall be at the sole discretion of the Town. No variance in the contract completion time(s) will be given for the inclusion of bid additives.

MODIFICATION/WITHDRAWAL OF BID

NOTE: THIS SECTION CONTAINS REVISED PROCUREMENT PROCEDURES

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

Prior to the time and date designated for receipt of Bids, a Bid submitted electronically to the Town via the Commonwealth's eVA website may be modified or withdrawn.

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

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

If within two (2) business days after Bids are opened and Bidder files a duly signed written notice, accompanied by original work papers, with the TOWN that there was a material and substantial mistake in the preparation of its Bid, that Bidder may withdraw its Bid, and the Bid security will be returned. Withdrawal of bids submitted to the TOWN is governed by Section 2.2-4330 of the Virginia Public Procurement Act (VPPA).

CONSIDERATION OF BIDS & BID OPENING

NOTE: THIS SECTION CONTAINS REVISED PROCUREMENT PROCEDURES

The TOWN shall have the right to reject any or all Bids, reject a Bid not accompanied by a required bid security or by other data required by the Bidding Documents, or reject a Bid, which is in any way incomplete or irregular. Though the eVA website does not reject multiple bid submissions, the TOWN permits only one bid to be submitted by the same firm in response to this IFB. Accordingly, the Town reserves the right to reject multiple bids submitted by the same firm in eVA. If a bidder submits more than one bid in response to this IFB, only the most recent submission will be considered, and previously submitted bids will be rejected.

All bids received will be opened publicly and read aloud utilizing the Commonwealth's eVA website. The bid opening for this project will be held at date and time specified in the Advertisement for Bid. The bid opening will be livestreamed via Cisco Webex for accessibility to the public.

After the bids are opened and publicly read aloud, the Town will recalculate the arithmetic of all bids. The recalculation will consist of the following:

1. The Extended Price will be the Quantity x Unit Price. The accuracy of this calculation will be verified for all unit price items of work. All mathematical errors will be corrected to arrive at the correct extended price. If no price is shown for the Unit Price, it is assumed to be zero.
2. The sum of all extensions will be calculated and any mathematical errors will be corrected.
3. If there are multiple sections to the bid, for example the Total Base Bid = Section 'A' + 'B', the sum of the sections will be calculated. All mathematical errors will be corrected.

The corrected price and correct sum thereof will be used to determine the lowest responsive, responsible bidder and will become the value of the recommended contract award.

AWARD

It is the intent of the TOWN to award a Contract to the lowest responsive and responsible Bidder, provided the low bid does not exceed the funds available. The Town reserves the right to accept or to reject any or all bids in whole or in part, to make multiple awards, and to waive informalities in the process of awarding this contract. The Notice of Intent to Award a contract resulting from this Invitation for Bid will be posted on the Public Notice Board at 25 W. Market Street, Leesburg, VA

and on the Town's Bid Board (<https://www.leesburgva.gov/bidboard>).

NEGOTIATIONS WITH THE LOWEST RESPONSIVE BIDDER

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

QUALIFICATIONS OF THE LOWEST RESPONSIVE BIDDER

This project requires specialized knowledge and expertise. The Contractor shall be well versed in the scope of work for this project. If the Contractor does not have specific experience with regards to projects similar in complexity they will not be considered for the award of this project. The Contractor must submit written information demonstrating experience by having completed a minimum of three (3) similar projects within the last ten (10) years and commit to the availability of key, skilled personnel necessary to complete the entire scope of work required for the project.

All qualification documentation shall be submitted as part of the bidder's bid package. Bids received without the required documentation shall be deemed non-responsive.

1. Project descriptions (3 similar projects, maximum of three (3) pages per project) indicating client, project scope, location, time frame).
2. The Superintendent and the Project Manager specified by the Contractor and assigned to this contract shall each have successfully worked on three (3) projects, similar in both size and scope, within the past ten (10) years. For work to be considered similar, work must be comparable to that shown in the scope of work.
3. Provide a reference list of three (3) municipal clients for whom the Contractor has performed and completed this type of work. Include reference contact information (email and phone number), and a description of work.
4. The Contractor shall self-perform a majority of the work. At the time of the bid, the Contractor shall name any anticipated subcontractors and define the work expected to be performed on the contract by each subcontractor.

PROTEST

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

ACCEPTANCE OF BID (VPPA 2.2-4337)

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

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

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

SCC IDENTIFICATION NUMBER (VPPA SECTION 2.2-4311.2)

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

VIRGINIA CONTRACTOR'S LICENSE NUMBER (CODE OF VIRGINIA §54.1-1115, A1 AND A6)

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

STIPULATED PRICES

The term "STIPULATED PRICE ITEM" means and includes an item of Work, unanticipated at the time of issuance of the solicitation for a Bid and determined to be executed, based on the actual field conditions during the progress of Work under the contract, mutually by the Engineer and the Contractor. The Unit Price for the "STIPULATED PRICE ITEM", as identified in the "Stipulated Price Items" section of the Bid Form, is predetermined by the Town as the current reasonably workable rate for the Item inclusive of all necessary labor, equipment, materials, overhead (provision and installation), and the Contractor's profit. Work on the "STIPULATED PRICE

ITEM” shall be carried out either at the written request of the Contractor followed by a written approval by the Engineer or at the written order by the ENGINEER to the Contractor. The payment for a “STIPULATED PRICE ITEM” shall be made by the Town to the Contractor at the related Unit Price specified in the ‘Stipulated Price Items’ section of the Bid Form on the same basis as the payment for any other regular Bid Item.

COMPENSATION AND PAYMENT

Payments are due and payable forty-five (45) days from the date of the Contractor’s invoice. Amounts unpaid sixty (60) days after the invoice date shall bear interest at the base rate on corporate loans (prime rate) at large United States money center commercial banks as reported daily in the Publication entitled The Wall Street Journal.

COORDINATION WITH UTILITIES

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

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

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

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

CONTRACT TIME

Substantial Completion:	280 calendar days from Notice to Proceed
Final Completion:	30 calendar days from Substantial Completion
Liquidated Damages:	\$1,000.00 per day

TREES

In the event that a tree is injured or damaged, the Contractor should contact the Owner’s Project Manager immediately.

CONTRACT ITEMS OF WORK

Work Hour Restrictions: Work hours on the project will be limited to sunrise to sunset, Monday through Friday. Weekend work will not be allowed without written permission from the Project Manager.

Construction Survey: This item is to include all survey and layout required to build the project.

Excavation: Haul-off excavation material shall be incidental to work items and Contractor shall include its cost in relevant pay items.

Hydrant Meter: The Contractor is required to obtain a fire hydrant meter from Town's Utility Department to be used for withdrawing water from a designated fire hydrant during construction. Any illegal hookup to a fire hydrant will result in a \$1,000 fine for the first offense and a \$2,500 fine for each subsequent offense on the same job.

Damage to Existing Fence: In the event that a fence is damaged, the Contractor shall replace in kind at no additional cost to the Town.

Test Pits: Test pits as described on the plans in the General Notes and as required by Miss Utility, are to be considered incidental to all other line items of work.

MAINTENANCE OF TRAFFIC FOR ACTIVITIES AFFECTING MILLER DRIVE

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

At all times the Contractor shall use the personnel and traffic control signs and devices necessary to comply with Part VI of the "National Manual on Uniform Traffic Control Devices". During the progress of the work when the street may be obstructed to any extent by construction equipment or construction operations, in addition to the signs and barricades, special workers, equipped with VDOT required "STOP\SLOW" double-sided traffic control paddles, shall be designated by the Contractor to direct traffic. These workers so designated shall not be assigned to any other duties while engaged in directing traffic. The workers assigned to the flagging duties shall be VDOT-certified. The Contractor has sole responsibility for ensuring that its operations are conducted in a safe manner and notwithstanding any other provision to the contrary, shall fully indemnify the Town of Leesburg, its officers, agents and employees for any damage or injury related to traffic operations which is caused by negligent or otherwise improper or deficient performance under the Contract or nonperformance of the terms of the Contract.

1. All personnel, signs, barricades and any other items necessary for the maintenance of traffic and safety shall be provided by the Contractor. This item is to be considered incidental to all other items of work.
2. The Contractor will not be permitted to work on the following holidays:
 - Annual Flower and Garden Show
 - Memorial Day
 - Independence Day
 - Labor Day
 - Thanksgiving
 - Day after Thanksgiving
 - Christmas Day
 - Day after Christmas
 - New Year's Day
3. Work hours on the portion of the project affecting Miller Drive will be limited to 7:00 a.m. to 7:00 p.m., Monday through Friday. Weekend work will not be allowed without written permission from the Project Manager.
4. The Contractor is required to submit a Maintenance of Traffic Plan for review and approval. Approval of the Maintenance of Traffic Plan is required prior to beginning any construction activities on the project. **The Maintenance of Traffic Plan is required for the issuance of the required right-of-way permit issued by the Town of Leesburg.**

STEEL/IRON PRICE ADJUSTMENT

This section will provide for additional compensation to the Contractor for increases, or repayment by the Contractor for decreases, in the price of steel/iron products. It will allow the Town to make price adjustments to account for changes in steel/iron product prices for materials eligible and identified by the Contractor, which will be permanently incorporated into the work. The Contractor will be entitled to this price adjustment on the structural components of the hangar buildings only and must submit the estimated weight of steel and average price per pound of steel including supporting bid documents to verify the price per pound, with the shop drawing submittals for the structures.

No adjustment will be provided for any new or additional work paid for on a time and materials basis. Additional quantities of existing contract pay items at original bid prices will be considered eligible work. Additional work added by agreed price will be considered eligible work. Work performed by the Contractor at its own expense will not be eligible for price adjustment.

No adjustment will be provided if the Contractor fails to provide the estimated weight of steel and average price per pound of steel with his shop drawing submittals for the hangar building structures.

The monthly average for steel cost basis and steel index values will be based on the U.S. Bureau of Labor Statistics Mid-Atlantic Information Office Producer Price Index – Metals and metal products – Fabricated structural metal products. The cost basis, benchmark steel index, monthly steel index, and the percentage change are defined as follows:

Cost Basis (CB): An average price of steel products in dollars per ton used solely as a cost basis from which to calculate steel/iron price adjustments. The cost basis for original contract bid price items and additional work at the original contract bid price will be the cost basis listed for the month of the bid letting. The cost basis for additional work at agreed price will be the value of the cost basis for the month the agreed price was submitted to the Engineer.

Benchmark Steel Index (BI): The benchmark steel index for original contract bid price items and additional work at the original contract bid price will be the value of the preliminary Producer Price Index (PPI) for the month of the bid letting. The benchmark steel index for additional work at agreed price will be the value of the preliminary PPI for the month the agreed price was submitted to the Engineer.

Monthly Steel Index (MI): Value of the preliminary PPI for the month the material is invoiced, by the supplier to the contractor. If a preliminary PPI is not posted for a given month, the value will be the average of the preceding and following months that are posted.

Percent Change: The percent change in any given month will be determined as follows:

$$\text{Percent Change} = \left(\frac{MI - BI}{BI} \right) \times 100$$

The quantity of steel for adjustment for each contract pay item, will be measured to the nearest 0.1 Ton. This price adjustment is capped at 60%. This means that the maximum value for the increase or decrease that can be used is 50% (60% - 10% threshold). Adjustments will be made by percentages as follows:

Percent Change Greater than +10%: If the Percentage Change is greater than 5% from the benchmark steel index, Price Adjustments will be made for materials invoiced by the supplier to the contractor for that month. The Contractor shall provide to the Engineer a detailed list of the weight of eligible materials within 60 calendar days after installation, including: the contract pay item, the weight of the steel, the month of invoice when the material is shipped to the fabricator, the source used to determine the weight, and copies of the invoices to verify the month of invoice from supplier to fabricator.

Percent Change -10% to +10%: If the Percentage Change is between -5% and +5%, inclusive, from the benchmark steel index, no adjustments will be made for materials invoiced that month.

Percent Change Lower than -10%: If the Percentage Change is lower than -5% from the benchmark steel index, a Price Adjustment will be charged to the Contractor for materials invoiced that month from the supplier to the Contractor. The Contractor shall provide to the Engineer a detailed list of the weight of eligible materials within 60 calendar days after installation, including: the contract pay item, the weight of the steel, the month of invoice when the material is shipped to the fabricator, the source used to determine the weight, and copies of the invoices to verify the month of invoice from supplier to fabricator.

No adjustment will be allotted for the time that the material is stored, staged or shipped. The adjustment for the steel pricing will be made for the materials included in the structural components for the hangar buildings, based on the following formulas:

When Price Increases:

$$Price\ Adjustment = \left[\left(\frac{MI - BI}{BI} \right) - 0.10 \right] (CB) Qty$$

When Price Decreases:

$$Price\ Adjustment = - \left[\left(\frac{MI - BI}{BI} \right) + 0.10 \right] (CB) Qty$$

This price adjustment will be measured on a dollars and cents basis. The adjustment will be based on the monthly steel index in effect at the time of the invoice between the supplier and Contractor, calculated using the price adjustment formula shown above.

END OF INSTRUCTIONS TO BIDDERS

TREE PROTECTION SPECIFICATIONS

SITE CLEARING, DEMOLITION

The following work must be accomplished before any demolition or site-clearing activity occurs within 100 feet of the tree(s) to be saved.

1. The site Contractor is required to meet with the Town Urban Forester at the site prior to beginning work to review all work procedures, access and haul routes, and tree protection measures.
2. The limits of all tree protection zones shall be staked in the field.
3. Tree(s) to be removed that have branches extending into the canopy of tree(s) to remain must be removed by a qualified arborist and not by demolition or construction contractors. A qualified arborist shall remove the tree in a manner that causes no damage to the tree(s) and understory to remain.
4. Any brush clearing required within the tree protection zone shall be accomplished with hand-operated equipment.
5. Trees to be removed shall be felled so as to fall away from tree protection zones and to avoid pulling and breaking of roots of trees to remain. If roots are entwined, the Town Urban Forester may require first severing the major woody root mass before extracting the trees. This may be accomplished by cutting through the roots by hand, with a vibrating knife, rock saw, narrow trencher with sharp blades, and other approved root-pruning equipment.
6. Trees to be removed from within the tree protection zone shall be removed by a qualified arborist. The trees shall be cut near ground level and the stump ground out.
7. All downed brush and trees shall be removed from the tree protection zone either by hand or with equipment sitting outside the tree protection zone. Extraction shall occur by lifting the material out, not by skidding it across the ground.
8. Brush shall be chipped and placed in the tree protection zone to a maximum depth of 6 inches leaving the trunk clear of mulch.
9. Structures and underground features to be removed within the tree protection zone shall use the smallest equipment possible, and operate from outside the tree protection zone. The Town Urban Forester shall be on site during all operations within the tree protection zone to monitor demolition activity.
10. All trees shall be pruned in accordance with the provided Pruning Specifications.
11. A 4-foot high, welded wire fence with steel T-posts shall be erected to enclose the tree

protection zone.

12. Any damage to trees due to demolition activities, shall be reported to the Town Urban Forester within 6-hours so that remedial action can be taken. Timeliness is critical to tree health.
13. If temporary haul or access roads must pass over the root area of trees to be retained, a road bed of 6 inches of mulch with ½ inch sheets of plywood on top shall be created to protect the soil. The roadbed material shall be replenished as necessary to maintain a 6-inch depth.

PRUNING SPECIFICATIONS

1. Specifications for individual trees, indicated by tree identification number, and describing which branches should be pruned and how, may be needed. Also consider requirements for crown reduction and crown raising where structures will be close to trees.
2. All trees within the project area shall be pruned to:
 - 2.1 Clear the crown of diseased, crossing, weak, and dead wood to a minimum size of 1-inch diameter;
 - 2.2 Provide 14 feet of vertical clearance over streets and 8 feet of vertical clearance over sidewalks;
 - 2.3 Remove stubs, cutting outside the wound wood tissue that has formed around the branch;
 - 2.4 Reduce end weight on heavy, horizontal branches by selectively removing small diameter branches, no greater than 2 to 3 inches, near the ends of the scaffolds.
 - 2.5 Where temporary clearance is needed for access, branches shall be tied back to hold them out of the clearance zone.
 - 2.6 Pruning shall not be performed during periods of flight of adult boring insects because fresh wounds attract pests. Pruning shall be performed only when the danger of infestation is past.
 - 2.7 A qualified arborist shall perform all pruning.
 - 2.8 All pruning shall be in accordance with the International Society of Arboriculture Tree-Pruning Guidelines and/or the ANSI A300 Pruning Standard (American National Standard for Tree Care Operations) and adhere to the most recent edition of ANSI Z133.1.
 - 2.9 Interior branches shall not be stripped out.
 - 3.0 Pruning cuts larger than 4 inches in diameter, except for dead wood, shall be avoided.

- 3.1 Pruning cuts that expose heartwood shall be avoided whenever possible.
- 3.2 No more than 20 percent of live foliage shall be removed within the trees.
- 3.3 While in the tree, the arborist shall perform an aerial inspection to identify defects that require treatment. Any additional work needed shall be reported to the Town Urban Forester.
- 3.4 Brush shall be chipped and chips shall be spread underneath trees within the tree protection zone to a maximum depth of 6 inches leaving the trunk clear of mulch.

CONSTRUCTION SPECIFICATIONS

1. Fences have been erected to protect trees to be preserved. Fences define a specific protection zone for each tree or group of trees. Fences are to remain until all site work has been completed. Fences may not be relocated or removed without the written permission of the Town Urban Forester.
2. Construction trailers and traffic and storage areas must remain outside fenced areas at all times.
3. All underground utilities and drain or irrigation lines shall be routed outside the tree protection zone. If lines must traverse the protection area, they shall be tunneled or bored under the tree(s).
4. No materials, equipment, spoil, or waste or washout water may be deposited, stored, or parked within the tree protection zone (fenced area).
5. Additional tree pruning required for clearance during construction must be performed by a qualified arborist and not by construction personnel.
6. Any herbicides placed under paving materials must be safe for use around trees and labeled for that use. Any pesticides used on site must be tree-safe and not easily transported by water.
7. If injury should occur to any retained tree during construction, it shall be reported to the Town Urban Forester within 6-hours so that remedial action can be taken.
8. All trees shall be irrigated. Each irrigation event shall wet the soil within the tree protection zone to a depth of 12 inches.
9. Erosion control devices such as silt fencing, debris basins, and water diversion structures shall be installed to prevent siltation and/or erosion within the tree protection zone.
10. Before grading, pad preparation, or excavation for foundations, footings, walls, or

trenching, trees shall be root pruned 1 foot outside the tree protection zone by cutting all roots cleanly to a depth of 24 inches. Roots shall be cut by manually digging a trench and cutting exposed 1” roots with a saw, vibrating knife, rock saw, narrow trencher with sharp blades or other approved root-pruning equipment.

11. Any roots damaged during grading or construction shall be exposed to sound tissue and cut cleanly with a saw.
12. If temporary haul or access roads must pass over the root area of trees to be retained, a roadbed of 6 inches of mulch with ½ plywood over the mulch shall be created to protect the soil. The roadbed material shall be replenished as necessary to maintain a 6-inch depth.
13. Spoil from trenches, basements, or other excavations shall not be placed within the tree protection zone, either temporarily or permanently.
14. No burn piles or debris pits shall be placed within the tree protection zone. No ashes, debris, or garbage may be dumped or buried within the tree protection zone.
15. Maintain fire-safe areas around fenced areas. Also, no heat sources, flames, ignition sources, or smoking is allowed near mulch or trees.

END OF SECTION

SAMPLE AGREEMENT

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

1. **WORK**

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

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

The project includes _____
_____.

2. **OWNER'S REPRESENTATIVES**

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

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

3. **CONTRACT TIME AND LIQUIDATED DAMAGES**

3.1 Time of the Essence

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

B. Contract Time:

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

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

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

3.2 Liquidated Damages

- A. TOWN and CONTRACTOR recognize that time is of the essence of this Agreement and the TOWN will suffer financial loss if the Work is not completed within the time specified in Paragraph 3.1 above, plus any extensions thereof allowed in accordance with the General Conditions, Article 8, "TIME." Contractor recognizes the delays, expense, and difficulties involved in proving in a legal or other dispute resolution proceeding the actual loss suffered by TOWN if the Work is not completed on time. Accordingly, instead of requiring any such proof, TOWN and CONTRACTOR agree that as liquidated damages for delay, but not as a penalty, CONTRACTOR shall pay the TOWN as follows:
 - a. For each day that expires after the time established to achieve Substantial Completion as specified above, CONTRACTOR shall pay TOWN liquidated damages in the amount of \$_____.
 - b. For each day that expires after the time established to achieve Final Completion as specified above, CONTRACTOR shall pay TOWN liquidated damages in the amount of \$_____.
 - c. [Insert liquidated damage rate for and Interim or Milestone dates.]
- B. CONTRACTOR hereby waives any defense as to the validity of any liquidated damages stated in this Agreement as they may appear on the ground that such liquidated damages are void as penalties or are not reasonably related to actual damages.
- C. TOWN may recover liquidated damages by deducting the amount owed from progress payments, final payment or retainage.

4. **CONTRACT PRICE**

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

A. Total Computed Price used for Comparison and Award:

(Words)

\$ _____
(Figures)

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

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

5. **INTEREST**

- 5.1 The TOWN will pay on all amounts owed to the CONTRACTOR accordance with Sections 2.2-4354 and 2.2-4355 of the Virginia Public Procurement Act.
- 5.2 The rate of interest charged shall be the base rate on corporate loans (prime rate) at large United States money center commercial banks as reported daily in the publication entitled The Wall Street Journal. Whenever a split prime rate is published, the lower of the two rates shall be used.

6. **CONTRACT DOCUMENTS**

- 6.1 The Contract Documents which comprise the entire Agreement between TOWN and CONTRACTOR concerning the Work are defined as follows:
 - A. This Agreement;
 - B. Payment Bond (attached);
 - C. Performance Bond (attached);
 - D. Insurance Certificate (attached);
 - E. CONTRACTOR'S Bid (attached);
 - F. Bidding Documents (by reference) including:
 - 1. Advertisement for Bids;
 - 2. Instructions to Bidders;
 - 3. General Conditions;

4. Specifications;
5. Supplemental Specifications;
6. Construction Drawings prepared by _____ bearing the following title:
 - _____(Sheets ____ through ____) approved
7. Addenda

G. Deliverables issued on or after the effective date of the Agreement and are not attached hereto:

1. Notice to Proceed
2. Written Amendments
3. Work Change Directives
4. Change Orders

7. **Notice**

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

The Owner:

The Owner's Project Manager:

The Contractor:

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

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

CONTRACTOR

By _____
Town Manager

By _____
President

Date _____

Date _____

License No: _____

[CORPORATE SEAL]

Approved as to Form:

Town Attorney

Resolution authorizing execution of Agreement is attached hereto.

Agent for service of process:

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

VIRGINIA PAYMENT BOND

BOND NO. _____

AMOUNT: \$ _____

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

_____ DOLLARS (\$ _____), lawful money of
the United States of America, for the payment of which, well and truly be made to the OWNER.

The CONTRACTOR and the SURETY bind themselves and each of their heirs, executors,
administrators, successors, and assigns, jointly and severally, firmly by these presents as follows:

THE CONDITION OF THE ABOVE OBLIGATION IS SUCH THAT:

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

_____, 20 _____,

for: _____

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

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

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

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

CONTRACTOR

By _____(Seal)

Attest

SURETY

By _____(Seal)

Attest

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

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

VIRGINIA PERFORMANCE BOND

BOND NO. _____

AMOUNT: \$_____

KNOW ALL MEN BY THESE PRESENTS, that _____

of _____

hereinafter called the CONTRACTOR (Principal), and _____

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

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

THE CONDITION OF THE ABOVE OBLIGATION IS SUCH THAT:

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

NOW, THEREFORE, the CONTRACTOR shall at all times duly, promptly, and faithfully perform the Contract and any alteration in or addition to the obligations of the CONTRACTOR arising there under, including the matter of infringement, if any, of patents or other proprietary rights, and shall assure all guarantees against defective workmanship and materials, including the guarantee period following final completion by the CONTRACTOR and final acceptance by the OWNER and comply with all covenants therein contained in the Specifications, Drawings, and other Documents constituting a part of the Contract required to be performed by the CONTRACTOR, in the manner and within the times provided in the Contract, and shall fully indemnify and save harmless the OWNER from all cost and damage which it may suffer by reason or failure so to do, and shall fully reimburse and repay it all outlay and expenses which it may incur in making good any default, and reasonable counsel fees incurred in the prosecution of or defense of any action arising out of or in connection with any such default, then this obligation shall be void; otherwise to remain in full force and effect.

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

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

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

CONTRACTOR

By _____(Seal)

Attest

SURETY

By _____(Seal)

Attest

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

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

THE TOWN OF LEESBURG

GENERAL CONDITIONS

IFB NO. 19002-FY21-31

**LEESBURG EXECUTIVE AIRPORT
NORTH HANGARS**

GENERAL CONDITIONS

THE TOWN OF LEESBURG

GENERAL CONDITIONS

ARTICLE 1: CONTRACT DOCUMENTS

1.1 DEFINITIONS

1.1.1 The Contract Documents

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

1.1.2 The Contract

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

1.1.3 The Work

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

1.1.4 The Project

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

1.1.5 Furnish, Install, Provide

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

1.1.6 Firm, Fixed Price or Lump Sum

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

GENERAL CONDITIONS

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

1.1.7 Schedule of Values

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

1.1.8 Miscellaneous Words or Terms

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

1.2 EXECUTION, CORRELATION AND INTENT

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

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

GENERAL CONDITIONS

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

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

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

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

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

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

GENERAL CONDITIONS

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

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

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

1.3 OWNERSHIP AND USE OF DOCUMENTS

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

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

END OF ARTICLE 1

GENERAL CONDITIONS

ARTICLE 2: OWNER'S PROJECT MANAGER

2.1 DEFINITIONS

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

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

2.2 SERVICES OF THE OWNER'S PROJECT MANAGER

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

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

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

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

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

END OF ARTICLE 2

GENERAL CONDITIONS

ARTICLE 3: OWNER

3.1 DEFINITIONS

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

3.2 INFORMATION, SERVICES AND RIGHTS OF THE OWNER

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

GENERAL CONDITIONS

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

3.3 OWNER'S RIGHT TO STOP OR TO SUSPEND WORK

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

GENERAL CONDITIONS

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

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

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

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

3.4 OWNER'S RIGHT TO CARRY OUT THE WORK

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

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

GENERAL CONDITIONS

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

3.5 EXAMINATION OF RECORDS

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

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

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

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

END OF ARTICLE 3

GENERAL CONDITIONS

ARTICLE 4: CONTRACTOR

4.1 DEFINITION

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

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

4.2 REVIEW OF CONTRACT DOCUMENTS

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

4.3 SUPERVISION AND CONSTRUCTION PROCEDURES

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

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

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

GENERAL CONDITIONS

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

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

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

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

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

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

4.4 INSPECTION OF CONSTRUCTION

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

GENERAL CONDITIONS

4.5 CONTRACTOR'S REPRESENTATIONS

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

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

GENERAL CONDITIONS

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

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

GENERAL CONDITIONS

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

4.6 LABOR AND MATERIALS

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

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

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

GENERAL CONDITIONS

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

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

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

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

GENERAL CONDITIONS

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

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

GENERAL CONDITIONS

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

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

GENERAL CONDITIONS

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

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

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

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

GENERAL CONDITIONS

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

4.7 WARRANTY

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

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

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

GENERAL CONDITIONS

4.7.3 The warranties set forth in this Article 4.7 and elsewhere in the Contract Documents shall survive Final Completion of the Work under Article 9.8 "FINAL COMPLETION AND FINAL PAYMENT."

4.7.4 If, within one year after the Date of Final Acceptance of the Work or designated portion thereof or within one year after acceptance by the Owner of designated equipment or within such longer period as may be prescribed by law or by the terms of the applicable special warranty required by the Contract Documents, any of the Work is found to be defective, not in accordance with the Contract Documents, or not in accordance with the guarantees and warranties specified in the Contract Documents, the Contractor shall correct it within five working days, or such other period as agreed, after receipt of written notice from the Owner or Owner's Project Manager to do so.

4.7.5 If at any time deficiencies in the Work are discovered that are found to have resulted from latent defects, gross mistakes, fraud or misrepresentation by the Contractor, any Subcontractor or Supplier, the Contractor will be liable for replacement or correction of such Work or any damage that the Owner has incurred, or will incur, related thereto, regardless of the time limit of any guarantees or warranty.

4.7.6 Any materials or other portions of the Work, installed, furnished, or stored on site that are not of the character or quality required by the specifications, or are otherwise not acceptable to the Owner's Project Manager shall be immediately removed and replaced by the Contractor to the satisfaction of the Owner's Project Manager when notified to do so by the Owner's Project Manager.

4.7.7 If the Contractor fails to correct defective or nonconforming Work as required by Article 4.7.4 or Article 4.7.5 or, if the Contractor fails to remove defective or nonconforming Work from the site, as required by Article 4.7.6, the Owner may elect to either correct such Work in accordance with Article 3.4 "OWNER'S RIGHT TO CARRY OUT THE WORK" or remove and store materials and equipment at the expense of the Contractor.

4.7.8 The Contractor shall bear the cost of making good all work of the Owner, separate contractors or others, destroyed or damaged by such correction or removal required under this Article, Article 13 "UNCOVERING AND CORRECTION OF WORK" or elsewhere in the Contract Documents.

4.8 TAXES

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

GENERAL CONDITIONS

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

4.9 PERMITS, FEES AND NOTICES

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

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

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

4.10 SUPERINTENDENT

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

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

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

GENERAL CONDITIONS

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

4.11 PROJECT SCHEDULES

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

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

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

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

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

GENERAL CONDITIONS

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

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

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

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

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

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

GENERAL CONDITIONS

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

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

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

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

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

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

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

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

GENERAL CONDITIONS

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

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

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

4.12 RESPONSIBILITY FOR COMPLETION

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

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

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

GENERAL CONDITIONS

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

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

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

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

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

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

4.14 SHOP DRAWINGS, PRODUCT DATA, SAMPLES AND OTHER SUBMITTALS

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

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

GENERAL CONDITIONS

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

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

GENERAL CONDITIONS

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

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

GENERAL CONDITIONS

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

4.15 CUTTING AND PATCHING OF WORK

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

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

4.16 DRUG-FREE WORKPLACE

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

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

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

GENERAL CONDITIONS

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

4.17 NON-DISCRIMINATION IN EMPLOYMENT

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

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

4.18 SIGNS

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

GENERAL CONDITIONS

4.19 CLEANING UP

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

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

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

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

4.20 ROYALTIES AND PATENTS

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

GENERAL CONDITIONS

4.21 ANTITRUST

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

4.22 INDEMNIFICATION

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

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

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

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

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

GENERAL CONDITIONS

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

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

4.23 PERSONS AUTHORIZED TO SIGN DOCUMENTS

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

4.24 ASBESTOS AND OTHER HAZARDOUS SUBSTANCES

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

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

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

GENERAL CONDITIONS

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

4.25 RIGHT TO PUBLISH

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

4.26 MATERIALS AND EQUIPMENT LIST

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

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

END OF ARTICLE 4

GENERAL CONDITIONS

ARTICLE 5: SUBCONTRACTORS

5.1 DEFINITIONS

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

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

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

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

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

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

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

GENERAL CONDITIONS

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

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

5.3 SUBCONTRACTUAL RELATIONS

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

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

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

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

5.4 QUALIFICATION SUBMITTALS

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

GENERAL CONDITIONS

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

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

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

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

END OF ARTICLE 5

GENERAL CONDITIONS

ARTICLE 6: WORK BY OWNER OR BY SEPARATE CONTRACTORS

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

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

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

6.2 MUTUAL RESPONSIBILITY

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

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

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

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

GENERAL CONDITIONS

6.3 OWNER'S RIGHT TO PERFORM DISPUTED WORK

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

6.4 COORDINATION OF THE WORK

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

END OF ARTICLE 6

GENERAL CONDITIONS

ARTICLE 7: MISCELLANEOUS PROVISIONS

7.1 GOVERNING LAW

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

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

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

7.2 SUCCESSORS AND ASSIGNS

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

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

GENERAL CONDITIONS

7.3 CLAIMS FOR DAMAGES

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

7.4 DISPUTES

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

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

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

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

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

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

GENERAL CONDITIONS

7.5 TESTS

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

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

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

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

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

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

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

GENERAL CONDITIONS

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

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

7.6 UNENFORCEABILITY OF ANY PROVISION

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

7.7 AVAILABILITY OF LANDS

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

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

7.8 NONEXCLUSIVITY OF REMEDIES

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

END OF ARTICLE 7

GENERAL CONDITIONS

ARTICLE 8: TIME

8.1 DEFINITIONS

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

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

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

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

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

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

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

GENERAL CONDITIONS

8.2 PROGRESS AND COMPLETION

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

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

8.3 DELAYS AND EXTENSIONS OF TIME

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

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

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

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

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

GENERAL CONDITIONS

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

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

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

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

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

GENERAL CONDITIONS

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

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

GENERAL CONDITIONS

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

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

END OF ARTICLE 8

GENERAL CONDITIONS

ARTICLE 9: PAYMENTS AND COMPLETION

9.1 CONTRACT PRICE

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

9.2 SCHEDULE OF VALUES

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

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

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

GENERAL CONDITIONS

9.3 APPLICATIONS FOR PAYMENT

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

GENERAL CONDITIONS

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

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

GENERAL CONDITIONS

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

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

9.4 CERTIFICATES FOR PAYMENT

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

9.5 PROGRESS PAYMENTS

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

GENERAL CONDITIONS

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

- .1 Pay the subcontractor for the proportionate share of the total payment received from the Owner attributable to the Work performed by the Subcontractor under this Contract; or
- .2. Notify the Owner and the Subcontractor, in writing, of the Contractor's intention to withhold all or a part of the Subcontractor's payment with the reason for nonpayment.

The Contractor is obligated to provide its social security numbers and if a proprietorship, partnership, or corporation, they must provide its federal employer identification number.

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

The Contractor shall include in each of its subcontracts a provision requiring each Subcontractor to include or otherwise be subject to the same payment and interest requirements with respect to each lower-tier Subcontractor.

The Contractor's obligation to pay an interest charge to a Subcontractor pursuant to the above provisions shall not be construed to be an obligation of the Owner. A Contract modification may not be made for the purpose of providing reimbursement for such interest charge. A cost reimbursement claim may not include any amount for reimbursement for such interest charge.

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

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

GENERAL CONDITIONS

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

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

9.6 PAYMENTS WITHHELD

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

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

GENERAL CONDITIONS

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

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

9.7 SUBSTANTIAL COMPLETION

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

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

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

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

GENERAL CONDITIONS

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

9.8 FINAL COMPLETION AND FINAL PAYMENT

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

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

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

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

GENERAL CONDITIONS

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

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

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

GENERAL CONDITIONS

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

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

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

9.9 PARTIAL OCCUPANCY OR USE

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

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

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

END OF ARTICLE 9

GENERAL CONDITIONS

ARTICLE 10: PROTECTION OF PERSONS AND PROPERTY

10.1 SAFETY PRECAUTIONS AND PROGRAMS

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

10.2 SAFETY OF PERSONS AND PROPERTY

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

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

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

GENERAL CONDITIONS

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

GENERAL CONDITIONS

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

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

GENERAL CONDITIONS

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

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

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

10.3 EMERGENCIES

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

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

END OF ARTICLE 10

GENERAL CONDITIONS

ARTICLE 11: BONDS AND INSURANCE

11.1 BONDS

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

GENERAL CONDITIONS

11.2 CONTRACTOR'S LIABILITY INSURANCE

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

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

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

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

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

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

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

GENERAL CONDITIONS

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

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

The Corporation must either:

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

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

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

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

GENERAL CONDITIONS

or anyone directly or indirectly employed by either of them.

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

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

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

GENERAL CONDITIONS

11.3 WAIVERS OF SUBROGATION

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

11.4 ADDITIONAL INSURANCE PROVISIONS

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

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

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

END OF ARTICLE 11

GENERAL CONDITIONS

ARTICLE 12: CHANGES IN THE WORK

12.1 CHANGES IN THE WORK

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

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

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

12.2 FIELD ORDER

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

12.3 REQUEST FOR PROPOSAL

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

GENERAL CONDITIONS

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

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

12.4 PROPOSED CHANGE ORDER

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

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

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

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

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

GENERAL CONDITIONS

12.5 CHANGE ORDER

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

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

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

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

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

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

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

GENERAL CONDITIONS

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

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

GENERAL CONDITIONS

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

12.6 UNILATERAL CHANGE ORDER

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

12.7 DECREASES AND WORK NOT PERFORMED

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

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

GENERAL CONDITIONS

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

12.8 CHANGES IN LINE AND GRADE

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

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

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

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

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

GENERAL CONDITIONS

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

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

12.9 DIFFERING SITE CONDITIONS

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

GENERAL CONDITIONS

12.10 CLAIMS FOR ADDITIONAL COST AND/OR TIME

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

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

12.11 ATTORNEYS' FEES AND OTHER EXPENSES

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

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

GENERAL CONDITIONS

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

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

END OF ARTICLE 12

GENERAL CONDITIONS

ARTICLE 13: UNCOVERING AND CORRECTION OF WORK

13.1 UNCOVERING OF WORK

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

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

13.2 CORRECTION OF WORK

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

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

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

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

GENERAL CONDITIONS

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

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

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

13.3 ACCEPTANCE OF DEFECTIVE OR NON-CONFORMING WORK

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

END OF ARTICLE 13

GENERAL CONDITIONS

ARTICLE 14: TERMINATION OF THE CONTRACT

14.1 TERMINATION FOR THE CONVENIENCE OF THE OWNER

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

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

14.1.3 Non-appropriation Clause

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

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

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

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

14.2 ALLOWABLE CONVENIENCE TERMINATION COSTS

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

GENERAL CONDITIONS

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

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

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

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

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

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

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

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

GENERAL CONDITIONS

14.3 DEFAULT TERMINATION

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

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

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

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

GENERAL CONDITIONS

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

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

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

14.4 GENERAL TERMINATION PROVISIONS

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

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

GENERAL CONDITIONS

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

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

GENERAL CONDITIONS

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

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

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

END OF ARTICLE 14

Section 10

Definition of Terms

When the following terms are used in these specifications, in the contract, or in any documents or other instruments pertaining to construction where these specifications govern, the intent and meaning shall be defined as follows:

Paragraph Number	Term	Definition
10-01	AASHTO	The American Association of State Highway and Transportation Officials.
10-02	Access Road	The right-of-way, the roadway and all improvements constructed thereon connecting the airport to a public roadway.
10-03	Advertisement	A public announcement, as required by local law, inviting bids for work to be performed and materials to be furnished.
10-04	Airport	Airport means an area of land or water which is used or intended to be used for the landing and takeoff of aircraft; an appurtenant area used or intended to be used for airport buildings or other airport facilities or rights of way; airport buildings and facilities located in any of these areas, and a heliport.
10-05	Airport Improvement Program (AIP)	A grant-in-aid program, administered by the Federal Aviation Administration (FAA).
10-06	Air Operations Area (AOA)	The term air operations area (AOA) shall mean any area of the airport used or intended to be used for the landing, takeoff, or surface maneuvering of aircraft. An air operation area shall include such paved or unpaved areas that are used or intended to be used for the unobstructed movement of aircraft in addition to its associated runway, taxiway, or apron.
10-07	Apron	Area where aircraft are parked, unloaded or loaded, fueled and/or serviced.
10-08	ASTM International (ASTM)	Formerly known as the American Society for Testing and Materials (ASTM).
10-09	Award	The Owner's notice to the successful bidder of the acceptance of the submitted bid.
10-10	Bidder	Any individual, partnership, firm, or corporation, acting directly or through a duly authorized

Paragraph Number	Term	Definition
		representative, who submits a proposal for the work contemplated.
10-11	Building Area	An area on the airport to be used, considered, or intended to be used for airport buildings or other airport facilities or rights-of-way together with all airport buildings and facilities located thereon.
10-12	Calendar Day	Every day shown on the calendar.
10-13	Certificate of Analysis (COA)	The COA is the manufacturer's Certificate of Compliance (COC) including all applicable test results required by the specifications.
10-14	Certificate of Compliance (COC)	The manufacturer's certification stating that materials or assemblies furnished fully comply with the requirements of the contract. The certificate shall be signed by the manufacturer's authorized representative.
10-15	Change Order	A written order to the Contractor covering changes in the plans, specifications, or proposal quantities and establishing the basis of payment and contract time adjustment, if any, for work within the scope of the contract and necessary to complete the project.
10-16	Contract	<p>A written agreement between the Owner and the Contractor that establishes the obligations of the parties including but not limited to performance of work, furnishing of labor, equipment and materials and the basis of payment.</p> <p>The awarded contract includes but may not be limited to: Advertisement, Contract form, Proposal, Performance bond, payment bond, General provisions, certifications and representations, Technical Specifications, Plans, Supplemental Provisions, standards incorporated by reference and issued addenda.</p>
10-17	Contract Item (Pay Item)	A specific unit of work for which a price is provided in the contract.
10-18	Contract Time	The number of calendar days or working days, stated in the proposal, allowed for completion of the contract, including authorized time extensions. If a calendar date of completion is stated in the proposal,

Paragraph Number	Term	Definition
		in lieu of a number of calendar or working days, the contract shall be completed by that date.
10-19	Contractor	The individual, partnership, firm, or corporation primarily liable for the acceptable performance of the work contracted and for the payment of all legal debts pertaining to the work who acts directly or through lawful agents or employees to complete the contract work.
10-20	Contractors Quality Control (QC) Facilities	The Contractor's QC facilities in accordance with the Contractor Quality Control Program (CQCP).
10-21	Contractor Quality Control Program (CQCP)	Details the methods and procedures that will be taken to assure that all materials and completed construction required by the contract conform to contract plans, technical specifications and other requirements, whether manufactured by the Contractor, or procured from subcontractors or vendors.
10-22	Control Strip	A demonstration by the Contractor that the materials, equipment, and construction processes results in a product meeting the requirements of the specification.
10-23	Construction Safety and Phasing Plan (CSPP)	The overall plan for safety and phasing of a construction project developed by the airport operator, or developed by the airport operator's consultant and approved by the airport operator. It is included in the invitation for bids and becomes part of the project specifications.
10-24	Drainage System	The system of pipes, ditches, and structures by which surface or subsurface waters are collected and conducted from the airport area.
10-25	Engineer	The individual, partnership, firm, or corporation duly authorized by the Owner to be responsible for engineering, inspection, and/or observation of the contract work and acting directly or through an authorized representative.
10-26	Equipment	All machinery, together with the necessary supplies for upkeep and maintenance; and all tools and apparatus necessary for the proper construction and acceptable completion of the work.

Paragraph Number	Term	Definition
10-27	Extra Work	An item of work not provided for in the awarded contract as previously modified by change order or supplemental agreement, but which is found by the Owner's Engineer or Resident Project Representative (RPR) to be necessary to complete the work within the intended scope of the contract as previously modified.
10-28	FAA	The Federal Aviation Administration. When used to designate a person, FAA shall mean the Administrator or their duly authorized representative.
10-29	Federal Specifications	The federal specifications and standards, commercial item descriptions, and supplements, amendments, and indices prepared and issued by the General Services Administration.
10-30	Force Account	<p>a. Contract Force Account - A method of payment that addresses extra work performed by the Contractor on a time and material basis.</p> <p>b. Owner Force Account - Work performed for the project by the Owner's employees.</p>
10-31	Intention of Terms	<p>Whenever, in these specifications or on the plans, the words "directed," "required," "permitted," "ordered," "designated," "prescribed," or words of like import are used, it shall be understood that the direction, requirement, permission, order, designation, or prescription of the Engineer and/or Resident Project Representative (RPR) is intended; and similarly, the words "approved," "acceptable," "satisfactory," or words of like import, shall mean approved by, or acceptable to, or satisfactory to the Engineer and/or RPR, subject in each case to the final determination of the Owner.</p> <p>Any reference to a specific requirement of a numbered paragraph of the contract specifications or a cited standard shall be interpreted to include all general requirements of the entire section, specification item, or cited standard that may be pertinent to such specific reference.</p>
10-32	Lighting	A system of fixtures providing or controlling the light sources used on or near the airport or within the airport buildings. The field lighting includes all luminous signals, markers, floodlights, and illuminating devices used on or near the airport or to

Paragraph Number	Term	Definition
		aid in the operation of aircraft landing at, taking off from, or taxiing on the airport surface.
10-33	Major and Minor Contract Items	A major contract item shall be any item that is listed in the proposal, the total cost of which is equal to or greater than 20% of the total amount of the award contract. All other items shall be considered minor contract items.
10-34	Materials	Any substance specified for use in the construction of the contract work.
10-35	Modification of Standards (MOS)	Any deviation from standard specifications applicable to material and construction methods in accordance with FAA Order 5300.1.
10-36	Notice to Proceed (NTP)	A written notice to the Contractor to begin the actual contract work on a previously agreed to date. If applicable, the Notice to Proceed shall state the date on which the contract time begins.
10-37	Owner	The term "Owner" shall mean the party of the first part or the contracting agency signatory to the contract. Where the term "Owner" is capitalized in this document, it shall mean airport Sponsor only. The Owner for this project is the Town of Leesburg.
10-38	Passenger Facility Charge (PFC)	Per 14 Code of Federal Regulations (CFR) Part 158 and 49 United States Code (USC) § 40117, a PFC is a charge imposed by a public agency on passengers enplaned at a commercial service airport it controls.
10-39	Pavement Structure	The combined surface course, base course(s), and subbase course(s), if any, considered as a single unit.
10-40	Payment bond	The approved form of security furnished by the Contractor and their own surety as a guaranty that the Contractor will pay in full all bills and accounts for materials and labor used in the construction of the work.
10-41	Performance bond	The approved form of security furnished by the Contractor and their own surety as a guaranty that the Contractor will complete the work in accordance with the terms of the contract.

Paragraph Number	Term	Definition
10-42	Plans	The official drawings or exact reproductions which show the location, character, dimensions and details of the airport and the work to be done and which are to be considered as a part of the contract, supplementary to the specifications. Plans may also be referred to as 'contract drawings.'
10-43	Project	The agreed scope of work for accomplishing specific airport development with respect to a particular airport.
10-44	Proposal	The written offer of the bidder (when submitted on the approved proposal form) to perform the contemplated work and furnish the necessary materials in accordance with the provisions of the plans and specifications.
10-45	Proposal guaranty	The security furnished with a proposal to guarantee that the bidder will enter into a contract if their own proposal is accepted by the Owner.
10-46	Quality Assurance (QA)	Owner's responsibility to assure that construction work completed complies with specifications for payment.
10-47	Quality Control (QC)	Contractor's responsibility to control material(s) and construction processes to complete construction in accordance with project specifications.
10-48	Quality Assurance (QA) Inspector	An authorized representative of the Engineer and/or Resident Project Representative (RPR) assigned to make all necessary inspections, observations, tests, and/or observation of tests of the work performed or being performed, or of the materials furnished or being furnished by the Contractor.
10-49	Quality Assurance (QA) Laboratory	The official quality assurance testing laboratories of the Owner or such other laboratories as may be designated by the Engineer or RPR. May also be referred to as Engineer's, Owner's, or QA Laboratory.
10-50	Resident Project Representative (RPR)	The individual, partnership, firm, or corporation duly authorized by the Owner to be responsible for all necessary inspections, observations, tests, and/or observations of tests of the contract work performed or being performed, or of the materials furnished or

Paragraph Number	Term	Definition
		being furnished by the Contractor, and acting directly or through an authorized representative.
10-51	Runway	The area on the airport prepared for the landing and takeoff of aircraft.
10-52	Runway Safety Area (RSA)	A defined surface surrounding the runway prepared or suitable for reducing the risk of damage to aircraft. See the construction safety and phasing plan (CSPP) for limits of the RSA.
10-53	Safety Plan Compliance Document (SPCD)	Details how the Contractor will comply with the CSPP.
10-54	Specifications	A part of the contract containing the written directions and requirements for completing the contract work. Standards for specifying materials or testing which are cited in the contract specifications by reference shall have the same force and effect as if included in the contract physically.
10-55	Sponsor	A Sponsor is defined in 49 USC § 47102(24) as a public agency that submits to the FAA for an AIP grant; or a private Owner of a public-use airport that submits to the FAA an application for an AIP grant for the airport.
10-56	Structures	Airport facilities such as bridges; culverts; catch basins, inlets, retaining walls, cribbing; storm and sanitary sewer lines; water lines; underdrains; electrical ducts, manholes, handholes, lighting fixtures and bases; transformers; navigational aids; buildings; vaults; and, other manmade features of the airport that may be encountered in the work and not otherwise classified herein.
10-57	Subgrade	The soil that forms the pavement foundation.
10-58	Superintendent	The Contractor's executive representative who is present on the work during progress, authorized to receive and fulfill instructions from the RPR, and who shall supervise and direct the construction.
10-59	Supplemental Agreement	A written agreement between the Contractor and the Owner that establishes the basis of payment and contract time adjustment, if any, for the work affected by the supplemental agreement. A supplemental

Paragraph Number	Term	Definition
		agreement is required if: (1) in scope work would increase or decrease the total amount of the awarded contract by more than 25%; (2) in scope work would increase or decrease the total of any major contract item by more than 25%; (3) work that is not within the scope of the originally awarded contract; or (4) adding or deleting of a major contract item.
10-60	Surety	The corporation, partnership, or individual, other than the Contractor, executing payment or performance bonds that are furnished to the Owner by the Contractor.
10-61	Taxilane	A taxiway designed for low speed movement of aircraft between aircraft parking areas and terminal areas.
10-62	Taxiway	The portion of the air operations area of an airport that has been designated by competent airport authority for movement of aircraft to and from the airport's runways, aircraft parking areas, and terminal areas.
10-63	Taxiway/Taxilane Safety Area (TSA)	A defined surface alongside the taxiway prepared or suitable for reducing the risk of damage to an aircraft. See the construction safety and phasing plan (CSPP) for limits of the TSA.
10-64	Work	The furnishing of all labor, materials, tools, equipment, and incidentals necessary or convenient to the Contractor's performance of all duties and obligations imposed by the contract, plans, and specifications.
10-65	Working day	A working day shall be any day other than a legal holiday, Saturday, or Sunday on which the normal working forces of the Contractor may proceed with regular work for at least six (6) hours toward completion of the contract. When work is suspended for causes beyond the Contractor's control, it will not be counted as a working day. Saturdays, Sundays and holidays on which the Contractor's forces engage in regular work will be considered as working days.
10-66	VDOT. The Virginia Department of Transportation.	The Virginia Department of Transportation.

Paragraph Number	Term	Definition
10-67	VDOT Road and Bridge Specifications, Current Edition.	The VDOT specifications where referenced shall have the same force and effect as if included in these project specifications physically.
10-68	VDOT Road And Bridge Standards, Current Edition.	The VDOT Standards where referenced shall have the same force and effect as if included in these project specifications physically.

END OF SECTION 10

Section 40

Scope of Work

40-01 Intent of contract. The intent of the contract is to provide for construction and completion, in every detail, of the work described. It is further intended that the Contractor shall furnish all labor, materials, equipment, tools, transportation, and supplies required to complete the work in accordance with the plans, specifications, and terms of the contract.

40-02 Alteration of work and quantities. The Owner reserves the right to make such changes in quantities and work as may be necessary or desirable to complete, in a satisfactory manner, the original intended work. Unless otherwise specified in the Contract, the Owner's Engineer or RPR shall be and is hereby authorized to make, in writing, such in-scope alterations in the work and variation of quantities as may be necessary to complete the work, provided such action does not represent a significant change in the character of the work.

For purpose of this section, a significant change in character of work means: any change that is outside the current contract scope of work; any change (increase or decrease) in the total contract cost by more than 25%; or any change in the total cost of a major contract item by more than 25%.

Work alterations and quantity variances that do not meet the definition of significant change in character of work shall not invalidate the contract nor release the surety. Contractor agrees to accept payment for such work alterations and quantity variances in accordance with TOL General Conditions.

Should the value of altered work or quantity variance meet the criteria for significant change in character of work, such altered work and quantity variance shall be covered by a supplemental agreement. Supplemental agreements shall also require consent of the Contractor's surety and separate performance and payment bonds. If the Owner and the Contractor are unable to agree on a unit adjustment for any contract item that requires a supplemental agreement, the Owner reserves the right to terminate the contract with respect to the item and make other arrangements for its completion.

40-03 Omitted items. The Owner, the Owner's Engineer or the RPR may provide written notice to the Contractor to omit from the work any contract item that does not meet the definition of major contract item. Major contract items may be omitted by a supplemental agreement. Such omission of contract items shall not invalidate any other contract provision or requirement.

Should a contract item be omitted or otherwise ordered to be non-performed, the Contractor shall be paid for all work performed toward completion of such item prior to the date of the order to omit such item. Payment for work performed shall be in accordance with TOL General Conditions.

40-04 Extra work. Should acceptable completion of the contract require the Contractor to perform an item of work not provided for in the awarded contract as previously modified by change order or supplemental agreement, Owner may issue a Change Order to cover the necessary extra work. Change orders for extra work shall contain agreed unit prices for performing the change order work in accordance with the requirements specified in the order, and shall contain any adjustment to the contract time that, in the RPR's opinion, is necessary for completion of the extra work.

When determined by the RPR to be in the Owner's best interest, the RPR may order the Contractor to proceed with extra work as provided in TOL General Conditions. Extra work that is necessary for acceptable completion of the project, but is not within the general scope of the work

covered by the original contract shall be covered by a supplemental agreement as defined in FAA Section 10, paragraph 10-59, *Supplemental Agreement*.

If extra work is essential to maintaining the project critical path, RPR may order the Contractor to commence the extra work under a Time and Material contract method. Once sufficient detail is available to establish the level of effort necessary for the extra work, the Owner shall initiate a change order or supplemental agreement to cover the extra work.

Any claim for payment of extra work that is not covered by written agreement (change order or supplemental agreement) shall be rejected by the Owner.

40-05 Maintenance of traffic. It is the explicit intention of the contract that the safety of aircraft, as well as the Contractor's equipment and personnel, is the most important consideration. The Contractor shall maintain traffic in the manner detailed in the Construction Safety and Phasing Plan (CSPP).

a. It is understood and agreed that the Contractor shall provide for the free and unobstructed movement of aircraft in the air operations areas (AOAs) of the airport with respect to their own operations and the operations of all subcontractors as specified in Section 80, paragraph 80-04, *Limitation of Operations*. It is further understood and agreed that the Contractor shall provide for the uninterrupted operation of visual and electronic signals (including power supplies thereto) used in the guidance of aircraft while operating to, from, and upon the airport as specified in Section 70, paragraph 70-15, *Contractor's Responsibility for Utility Service and Facilities of Others*.

b. With respect to their own operations and the operations of all subcontractors, the Contractor shall provide marking, lighting, and other acceptable means of identifying personnel, equipment, vehicles, storage areas, and any work area or condition that may be hazardous to the operation of aircraft, fire-rescue equipment, or maintenance vehicles at the airport in accordance with the construction safety and phasing plan (CSPP) and the safety plan compliance document (SPCD).

c. When the contract requires the maintenance of an existing road, street, or highway during the Contractor's performance of work that is otherwise provided for in the contract, plans, and specifications, the Contractor shall keep the road, street, or highway open to all traffic and shall provide maintenance as may be required to accommodate traffic. The Contractor, at their expense, shall be responsible for the repair to equal or better than preconstruction conditions of any damage caused by the Contractor's equipment and personnel. The Contractor shall furnish, erect, and maintain barricades, warning signs, flag person, and other traffic control devices in reasonable conformity with the Manual on Uniform Traffic Control Devices (MUTCD) (<http://mutcd.fhwa.dot.gov/>), unless otherwise specified. The Contractor shall also construct and maintain in a safe condition any temporary connections necessary for ingress to and egress from abutting property or intersecting roads, streets or highways. Unless otherwise specified herein, the Contractor will not be required to furnish snow removal for such existing road, street, or highway.

40-06 Removal of existing structures. All existing structures encountered within the established lines, grades, or grading sections shall be removed by the Contractor, unless such existing structures are otherwise specified to be relocated, adjusted up or down, salvaged, abandoned in place, reused in the work or to remain in place. The cost of removing such existing structures shall not be measured or paid for directly, but shall be included in the various contract items.

Should the Contractor encounter an existing structure (above or below ground) in the work for which the disposition is not indicated on the plans, the Resident Project Representative (RPR) shall be notified prior to disturbing such structure. The disposition of existing structures so

encountered shall be immediately determined by the RPR in accordance with the provisions of the contract.

Except as provided in Section 40, paragraph 40-07, *Rights in and Use of Materials Found in the Work*, it is intended that all existing materials or structures that may be encountered (within the lines, grades, or grading sections established for completion of the work) shall be used in the work as otherwise provided for in the contract and shall remain the property of the Owner when so used in the work.

40-07 Rights in and use of materials found in the work. Should the Contractor encounter any material such as (but not restricted to) sand, stone, gravel, slag, or concrete slabs within the established lines, grades, or grading sections, the use of which is intended by the terms of the contract to be embankment, the Contractor may at their own option either:

- a. Use such material in another contract item, providing such use is approved by the RPR and is in conformance with the contract specifications applicable to such use; or,
- b. Remove such material from the site, upon written approval of the RPR; or
- c. Use such material for the Contractor's own temporary construction on site; or,
- d. Use such material as intended by the terms of the contract.

Should the Contractor wish to exercise option a., b., or c., the Contractor shall request the RPR's approval in advance of such use.

Should the RPR approve the Contractor's request to exercise option a., b., or c., the Contractor shall be paid for the excavation or removal of such material at the applicable contract price. The Contractor shall replace, at their expense, such removed or excavated material with an agreed equal volume of material that is acceptable for use in constructing embankment, backfills, or otherwise to the extent that such replacement material is needed to complete the contract work. The Contractor shall not be charged for use of such material used in the work or removed from the site.

Should the RPR approve the Contractor's exercise of option a., the Contractor shall be paid, at the applicable contract price, for furnishing and installing such material in accordance with requirements of the contract item in which the material is used.

It is understood and agreed that the Contractor shall make no claim for delays by reason of their own exercise of option a., b., or c.

The Contractor shall not excavate, remove, or otherwise disturb any material, structure, or part of a structure which is located outside the lines, grades, or grading sections established for the work, except where such excavation or removal is provided for in the contract, plans, or specifications.

40-08 Final cleanup. Upon completion of the work and before acceptance and final payment will be made, the Contractor shall remove from the site all machinery, equipment, surplus and discarded materials, rubbish, temporary structures, and stumps or portions of trees. The Contractor shall cut all brush and woods within the limits indicated and shall leave the site in a neat and presentable condition. Material cleared from the site and deposited on adjacent property will not be considered as having been disposed of satisfactorily, unless the Contractor has obtained the written permission of the property Owner.

END OF SECTION 40

PROJECT SPECIAL PROVISIONS

PSP-1 NOTAMS (As Required)

The OWNER will issue the necessary NOTAMS to reflect hazardous and operational conditions. The Contractor shall work with the ENGINEER and OWNER to schedule NOTAM issuance and Airport Operations Area (AOA) closures and shall provide the OWNER and ENGINEER with advance notice of the need to issue or close a NOTAM. It is important that NOTAMS be kept current and reflects the actual conditions with respect to construction situations. Active NOTAMS shall be reviewed periodically and revised to reflect the current conditions.

PSP-2 BID EVALUATION AND CONTRACT AWARD

This project is programmed for federal FY 2021 AIP funding. The Owner expects to be able to award this project, depending on bid results and the final funding level FAA can assign to the project. As of the date of the advertisement, the award of this project is considered most likely.

The Owner reserves the right to reject all bids or to award the bid based on the lowest responsible and responsive bid for any single phase or any combination of phases as available funding allows and as best suits the Owner's interests as determined by the Owner. It is the Owner's intent to award only one construction contract as a result of this bid solicitation.

PSP-3 HAUL ROADS

Haul roads to be used under this Contract shall be those designated and approved by the ENGINEER. In general, the Contractor shall confine his equipment and hauling where practical to existing roads on the Airport, as shown in the plans. If existing pavement is damaged by the Contractor's hauling operations, it shall be repaired to its original condition at the Contractor's expense. Haul roads across turfing areas shall be repaired, scarified, seeded, mulched, and fertilized at the Contractor's expense. Metal track vehicles will not be permitted to operate on or across existing pavement without protective matting to prevent marring of the pavement surface. Haul roads shall be constructed and paid for under Mobilization. All costs associated with supplying, constructing, maintaining and restoring temporary haul roads shall be included in the lump sum price bid for "Mobilization."

PSP-4 TEMPORARY CONSTRUCTION ZONE FLAGGING

The Contractor is responsible for supplying, erecting, and maintaining temporary construction zone flagging, fencing, etc. in the areas shown on the plans, as directed by the ENGINEER, or at the contractor's discretion based on the contractor's company safety plan. This flagging, fencing,

etc. shall be continuous and fluorescent and define construction areas outside limits of temporary security fence. All costs associated with supplying, erecting, relocating, and maintaining temporary construction zone flagging, fencing, etc. shall be included in the lump sum bid price for "Mobilization".

PSP-5 PROTECTION OF EXISTING FACILITIES

All existing facilities will be carefully protected by the Contractor. Any facilities damaged by the Contractor will be repaired immediately and restored to original condition. The contractor shall be required to provide a private utility locating firm for all private utility locations. All runway lights, taxiway lights, signs, and concrete surfaces to remain exposed shall be protected from asphalt and paint spray by suitable means. These and any other above-ground facilities shall be cleaned, if asphalt or paint is deposited on them, to the satisfaction of the ENGINEER. It is understood and agreed that the OWNER does not guarantee the accuracy or the completeness of the location information relating to existing utility services, facilities or structures that may be shown on the plans or encountered in the work. Any inaccuracy or omission in such information shall not relieve the Contractor of his/her responsibility to protect such existing features from damage or unscheduled interruption of service.

Should the Contractor damage or interrupt the operations of a utility service or facility outside the project limits by accident or otherwise, he shall immediately notify the proper authority and the ENGINEER and shall take all reasonable measures to prevent further damage or interruption of service. The Contractor, in such events, shall cooperate with the utility service or facility owner and the ENGINEER continuously until such damage has been repaired and service restored to the satisfaction of the utility or facility owner.

The Contractor shall bear all costs of damage and restoration of service to any utility service or facility due to his/her operations whether due to negligence or accident. The Contract Owner reserves the right to deduct such costs from any monies due or which may become due to the Contractor.

PSP-6 DUST CONTROL

It is the intent of these specifications that the Contractor will, by watering, chemicals, vegetation, or other means, prevent the occurrence of dust which will be objectionable to the residents of the area or violate existing laws or regulation or cause hazards to air traffic. The Contractor shall immediately implement dust control procedures when requested or as directed by the ENGINEER or OWNER. The contractor shall always have at least one operable water distribution truck on site .

PSP-7 DEWATERING

Contractor may encounter wet conditions during construction. The contractor shall satisfy himself of the presence of wet conditions and take such conditions into account in preparing the bid. All cost for dewatering by any means and for temporary support of excavation is considered incidental to cost of items of work bid upon. The Contractor shall be required to provide properly sized pumps, hoses and all appurtenances necessary to successfully dewater throughout the duration of the project. Managing site drainage will be the responsibility of the contractor.

The Contractor is required to provide the proper sediment and erosion controls for dewatering operations and shall be consistent with the requirements established under the National Pollutant Discharge Elimination System requirements and the Contractors land disturbing permit for this construction activity. This shall include providing geotextile bags made of permeable, nonwoven geotextiles to be fitted to the ends of each pump as required (also incidental to the work).

PSP-8 PROGRESS MEETINGS

A bi-weekly progress meeting will be held throughout the project. The purpose of these meetings will be scheduling and coordination of the work between Contractors. The Contractor will be required to have a qualified representative at each of these meetings. Additional meetings may be necessary and will be scheduled as required. The contractor will be required to bring an updated schedule to each meeting.

PSP-9 SUBGRADE PREPARATION

The subgrade soils on this project are expected to be clayey silts some fatty clays that will be non-cohesive and wet of optimum. Soils of these types are generally moisture sensitive and will degrade under wheeled traffic if not protected. Care should be taken by the contractor to protect the existing subgrades once they are exposed. The project intent is to construct a pavement subgrade which is on-grade, properly shaped, stable, and compliant with the requirements of P-152. The Contractor shall assess his means and methods for working the site and managing traffic across the existing and prepared sub-grades.

The contractor shall strip and remove all demolition material, excess debris, grass, vegetation, etc. from the areas to be graded or paved.

During subgrade preparation efforts, the contractor shall take all necessary measures to protect the exposed subgrade from rainfall and other sources of unwanted water. This shall include shaping and rolling to seal off the surface when rain is imminent, and timely pumping from appropriately sized temporary sumps.

Prior to the placement of stone, the final subgrade shall be proof rolled and observed by the ENGINEER or OWNERS representative. Any soft or un-stable materials encountered during

proof rolling shall be removed, as directed by the ENGINEER, and replaced with backfill material, or scarified and re-compacted as directed by the ENGINEER. The presence of wet material will not automatically constitute the presence of unsuitable material and will be determined by the ENGINEER. For suitable material, moisture conditioning shall be accomplished by means of frequent manipulation and exposure to air, sun, and wind. Existing sub-grade soils are anticipated to be suitable for compaction. Based on boring data the contractor should anticipate drying of this material to a depth of 12" via moisture conditioning prior to the placement of stone. The contractor should anticipate moisture conditioning as many times as required to bring the sub-grade material within +/- 2% of optimum moisture.

The Contractor is required to provide the proper sediment and erosion controls for dewatering operations and shall be consistent with the requirements established under the National Pollutant Discharge Elimination System requirements and the Contractors land disturbing permit for this construction activity. This shall include providing geotextile bags made of permeable, nonwoven geotextiles to be fitted to the ends of each pump as required (also incidental to the work).

PSP-11 SEQUENCE OF CONSTRUCTION AND RESPONSIBILITY FOR COMPLETION

Refer to the project plans for the general sequence of construction. The general sequence of construction is intended to provide general guidance to the Contractor, but shall not relieve the Contractor of his responsibility to sequence and schedule his operations in sufficient detail in such a manner to successfully complete all work of the project within the allotted time and in accordance with the Contract Requirements.

In accordance with the specifications, the Contractor shall provide a schedule of construction to the ENGINEER for review and approval prior to commencing construction. The Contractor's schedule and work sequence shall consider all the phases of work and shall be coordinated with the Owner and Engineer toward achieving an effective, creative approach to completing the work in a timely fashion which minimizes inconvenience to airport users. The schedule shall be kept up to date for the duration of the project. The schedule shall be reviewed at each progress meeting. The Contractor shall be responsible for maintaining an up to date schedule.

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

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

If the actions taken by the Contractor are not satisfactory, the Owner or the Owner's Project Manager may direct the Contractor to take any and all actions necessary to ensure completion within the required completion dates, without additional cost to the Owner. In such event, the Contractor shall continue to assume responsibility for his performance and for completion within the required dates.

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

The Contractor shall be responsible for implementing and executing the Work specified in the Contract in strict conformance with the approved schedule. The schedule shall be the Contractor's work plan for completing the entire Contract as specified in the Contract Documents. Failure of the Contractor to adhere to the latest approved schedule or to maintain and update the schedule for the duration of the project will be cause for the Owner to deny any and all requests for additional compensation or extensions of the Contract duration.

PSP-12 SHOP DRAWINGS AND DATA SUBMITTALS

The Contractor is responsible for the preparation of detailed shop drawings, material data submittals, project schedule, Contractor Quality Control Plan, mix designs and other such data necessary for the fabrication, erection and construction of all parts of the work in conformity with the Contract Documents. Six (6) copies of shop drawings and data submittals shall be submitted to the ENGINEER in accordance with the procedures herein described.

Alternatively, shop submittals may be made via email in PDF format. Telephonic confirmation of receipt is advisable.

It will be critical to have shop drawings and data submitted as soon as possible after the contract has been awarded so that there will not be any delay in beginning the construction.

"Shop Drawings", wherever referred to, shall be defined as drawings, diagrams, illustrations,

schedules, catalog cuts, performance charts, brochures, and other data prepared by the Contractor or any Subcontractor, manufacturer, supplier or distributor, which illustrate how specific portions of the work shall be fabricated and/or installed.

Where it is difficult to provide "shop drawing transparencies such as for "catalog cuts", "brochures" or "photographs", the Contractor shall submit a minimum of six (6) copies of such "cuts", "brochures" or "photographs." Additional copies shall be supplied when required by the ENGINEER.

All submissions of shop drawings, brochures and catalog cuts shall be accompanied by a transmittal letter listing the drawings submitted by number and title.

Each shop drawing shall have listed on it all Contract references, drawing numbers, plus shop drawing numbers on related work by other Subcontractors, if available.

Non-reproducible shop drawings shall be submitted with a cover sheet containing all of the information required on reproducible shop drawings.

Shop drawings shall be complete in every detail, including a location plan relating the work to space identification and column numbers. Materials, gauges, method of fastening, size and spacing of fastenings, connections with other work, cutting, fitting, drilling, and any and all other necessary information as per usual trade practice or as required for any specific purpose must be clearly shown.

The Contractor shall check and approve all shop drawings to make sure that they conform to the drawings, specifications, and other Contract requirements, and correct the drawings found to be inaccurate or otherwise in error. The Contractor shall verify all field dimensions and criteria and shall be responsible for the coordination of work by all Subcontractors.

Shop drawings, at the time of submission, shall bear the signature of the Contractor's reviewer, date, and stamp of approval for submission to the ENGINEER as evidence that such drawings and/or details have been reviewed, checked and approved by the Contractor. Drawings submitted without such stamp of approval will be returned to the Contractor unapproved and will require resubmission. In such event, it will be deemed that the Contractor has not complied with the requirements of this subsection and shall bear the risks of delays as if no drawings or details had been submitted. Both sepia and prints must bear Contractor's stamp.

The Contractor, by approving and submitting shop drawings, represents that he has determined and verified all field measurements and quantities, field construction criteria, materials, catalog numbers, and similar data, and that he has reviewed and coordinated the information in the shop drawings with the requirements of the work and the Contract documents.

At the time of submission, the Contractor shall inform the ENGINEER in writing of any deviation

in the shop drawings or samples from the requirements of the Contract documents.

The ENGINEER will review and approve shop drawings and samples with reasonable promptness so as to minimize delay, but only for conformance with the design concept of the Contract and with the information given in the Contract documents. The ENGINEER'S approval of a separate item shall not indicate approval of an assembly in which the item functions. The ENGINEER will return the shop drawings transparency/sepia to the Contractor for his use and distribution.

The ENGINEER'S approval of shop drawings or samples shall not relieve the Contractor of responsibility for any deviation from the requirements of the Contract documents unless the Contractor has informed the ENGINEER in writing of such deviation at the time of submission and the ENGINEER has given written approval to the specific deviation, nor shall the ENGINEER'S approval relieve the Contractor from responsibility for errors or omissions in the shop drawings or samples. This shall include all federal required contract provisions.

No materials shall be ordered and no portion of the work requiring shop drawings or sample submission shall be commenced until the submission has been approved by the ENGINEER. All such materials and portions of work shall be in accordance with approved shop drawings and samples.

The Contractor shall, when requested by the ENGINEER in writing, submit additional shop drawings to those required by the technical specifications or special provisions.

The Contractor shall deliver to the ENGINEER three (3) complete sets of all maintenance manuals, parts list, operating instructions, and other necessary documents required for all installed materials, equipment, or machinery. Such documents shall be furnished concurrently with the installations of the respective materials, equipment, or machinery. All shop drawings submitted by the Contractor and approved by the ENGINEER become part of the Contract documents.

PSP-13 INSPECTIONS, FEES, PERMITS AND BONDS

This project may be subject to regulatory and construction inspection by the OWNER or agents thereof, and/or Loudoun County and/or the Town of Leesburg. These regulatory inspections will involve, but are not necessarily limited to, erosion and sediment control, storm water management aspects of the work, foundation inspections, electrical inspections, and inspections by the Fire Marshal's office. The Contractor shall fully cooperate with these inspections.

PSP-14 EXAMINATION OF PLANS, SPECIFICATIONS, AND SITE

The bidder is expected to carefully examine the site of the proposed work, the proposal, plan, specifications, and Contract forms. He shall satisfy himself as to the character, quality, and quantities of work to be performed, materials to be furnished, and as to the requirements of the proposed Contract. The Contractor shall bid this project in its entirety. The cost for all elements

described within the plans and specifications shall be included in the contract bid proposal at the time of bid opening. The intent of the contract is to provide for construction and completion, in every detail, of the work described within these plans and specifications. The list of quantities does not list incidental items of work. The Contractor shall determine what line items incidentals are bid. Questions regarding incidentals or items of work not specifically called out in the list of quantities shall be addressed to the Engineer prior to submission of bid. The submission of a bid shall be prima facie evidence that the bidder has made such examination and is satisfied as to the conditions to be encountered in performing the work and as to the requirements of the proposed Contract, plans, and specifications. Site visits can be arranged by contacting the Leesburg Executive Airport staff at (703) 737-7125.

PSP-15 CONSTRUCTION LAYOUT AND CONTROL

It shall be the Contractor's responsibility to layout the work as indicated in the Plans and in section 50-06 of the Specifications. All survey work shall be performed under the supervision of a Land Surveyor licensed in the State of Virginia, by qualified personnel with instruments and equipment subject to the approval of the ENGINEER.

The Contractor shall provide sufficient construction staking during project to control field operations and aid in preparation of partial pay requests. Protection of the existing benchmarks and installation of supplemental control necessary to complete the work shall be the responsibility of the contractor.

PSP- 16 AS CONSTRUCTED DRAWINGS

The Contractor will be required to maintain a set of as constructed plans on the project at all times, noting any changes, deviations, etc., with the responsibility to furnish the OWNER, at the completion of the project, a set of as constructed plans. These as constructed plans shall be delivered to the ENGINEER prior to final acceptance.

PSP-17 GROUND COVER REQUIREMENTS

Each work area shall be stabilized with either temporary or permanent stabilization measures within 7 days after construction activity has ceased in that work area. Application of temporary stabilization measures in an area may be waived if the Contractor demonstrates by means of the latest updated construction schedule that each disturbing operations will resume in that area within 30 days after the prior activity in that area ceased *and* perimeter and/or downstream controls are in place to control sediment from that work area.

PSP-18 DEBRIS DISPOSAL

The Contractor shall dispose of concrete and other debris off airport property in a properly

permitted location. All costs for offsite disposal shall be included in the related items bid upon.

PSP-19 WORK PHASES, CONTRACT TIME AND LIQUIDATED DAMAGES

The Leesburg Executive Airport is a general aviation, public use airport that is an integral part of the Virginia and national aviation transportation system. The site for this project is adjacent to the primary runway for the airport, serving all aircraft using the airport. It is not possible to close the runway during construction.

Liquidated Damages, in the amount of \$1,000.00 per calendar day, will be assessed for failure to complete the work of any phase or the total work of the contract within the specified Contract Time.

The Contractor will be required to submit for approval a detailed Schedule of Work to the ENGINEER seven days prior to the Preconstruction Conference. After the ENGINEER approves the schedule of work, the Contractor will be required to follow the approved schedule of work unless deviations are approved by the ENGINEER (see PSP-12).

Detailed information and notes regarding safety, access, communications and related matters are included on the plans.

The schedule shall be prepared using construction scheduling software, such as Primavera or Microsoft project. The baseline schedule and periodic updates shall be printed on 11x17 paper with color or symbols used to depict the critical path, progress, slippage, etc. Updates shall be submitted monthly; in the event of any significant slippage in the critical path, weekly update shall be provided, depicting the Contractor's schedule recovery plan and re-sequencing of work elements.

The Contractor's attention is directed to the following requirements in developing his Schedule of Work:

1. The purpose of the Schedule of Work is to assure a safe area of operation for the Contractor and Airport traffic, maintenance of traffic on the taxiways adjacent to the construction areas, and performance of the construction in an acceptable manner and time frame.
2. Although it is not anticipated, there may be more than one contractor working for the Town of Leesburg, its tenants or the FAA in the project area simultaneously. The Contractor will be required to coordinate all work with the OWNER and ENGINEER to minimize conflicts with other contractors.
3. The Contractor shall make his own estimate of the difficulties involved in arranging the work to comply with the above requirements and shall not claim any added compensation by

reason of delay or increased cost due to these requirements.

4. The schedule shall include, but is not limited to, approximate dates and exact time intervals for performing each work task, schedules for shop drawing submittals, review times, procurement schedules, and delivery dates.

The Contractor shall coordinate and cooperate fully with the Owner, Engineer, and airport tenants throughout the construction period to coordinate construction activities with airport operations. This shall include participation in project progress meetings, informal site meetings, telephone and email communication, etc. The Contractor shall, to the extent practicable and consistent with maintaining the progress of the work, adjust his operations and schedule to accommodate aircraft operations on the field. Often, aircraft operational needs can be met without significant impact to construction progress through effective coordination and communication, with attention to procedural matters and scheduling.

PSP-20 STAGING AREA

The Contractor shall provide the staging area in the general location shown on the plans. The lump sum price shall be full compensation for furnishing all materials; and for all labor, equipment, tools and incidentals necessary to complete the item. The item shall include but not be limited to fencing, gates, signs, and stone. Also included is the removal of all previously mentioned items, including the repair, scarifying, seeding, mulching, and fertilizing of the area to achieve a stand of grass acceptable to the Engineer. The area shall be returned to its original condition and be accepted by the owner before final payment is issued.

Payment for the staging area will be made in two equal installments. The first installment of 50 percent of the contract lump sum price will be made on the first progress estimate. The second installment will be made following satisfactory completion of the final clean-up of the staging area, as previously noted, at the completion of the project.

Payment will be made under:

Staging Area

Lump Sum

PSP-21 STORMWATER POLLUTION PREVENTION PLAN (SWPPP)

The Contractor shall develop and update, as needed, a SWPPP for construction activity to meet the requirements of the Virginia Department of Environmental Quality. A copy of the SWPPP, in addition to the approved sediment and erosion control plan, is required to remain on the construction site throughout the entirety of the project. The contractor is required to follow all requirements of the permit including but not limited to inspections, update of the SWPPP as required and coordination with the local inspector. There is no pay item for developing and

maintaining the SWPPP.

PSP-22 CONTRACTOR QUALITY CONTROL

When the specification requires Contractor Quality Control testing, the Contractor shall establish, provide, and maintain effective Quality Control on the site meeting the methods and procedures to assure that all materials and completed construction required by this contract conform to contract plans, technical specifications and other requirements, whether manufactured by the Contractor, or procured from subcontractors or vendors. Although guidelines are established and certain minimum requirements are specified in the contract technical specifications, the Contractor shall assume full responsibility for accomplishing the stated purpose.

The Contractor shall adequately provide to produce acceptable quality materials and provide sufficient information to assure both the Contractor and the Engineer that the specification requirements are being met.

The Contractor shall not begin any construction until the Quality Control firm has been identified and approved by the Engineer (i.e. sub-contractor, inner company).

The quality control requirements contained in the contract technical specifications are in addition to and separate from the acceptance testing requirements. Acceptance testing requirements are the responsibility of the Engineer.

The Contractor shall establish a Quality Control program to perform quality control inspection and testing of all items of work required by the technical specifications, including those performed by subcontractors. This Quality Control Program shall ensure conformance to applicable specifications and plans with respect to materials, workmanship, construction, finish, and functional performance. The Quality Control Program shall be effective for control of all construction work performed under this Contract and shall specifically include surveillance and tests required by the technical specifications, in addition to other requirements of this section and any other activities deemed necessary by the Contractor to establish an effective level of quality control.

The Contractor shall submit a coordinated construction schedule for all work activities. The schedule shall be prepared as a network diagram in Critical Path Method (CPM), Program Evaluation and Review Technique (PERT), or another approved format. As a minimum, it shall provide information on the sequence of work activities, milestone dates, and activity duration.

The Contractor shall maintain the work schedule and provide an update and analysis of the progress schedule on a twice monthly basis, or as otherwise specified in the contract. Submission of the work schedule shall not relieve the Contractor of overall responsibility for scheduling, sequencing, and coordinating all work to comply with the requirements of the contract.

Inspection requirements

Quality control inspection functions shall be organized to provide inspections for all definable features of work.

Inspections shall be performed daily to ensure continuing compliance with contract requirements until completion of the feature of work. These shall include the following minimum requirements:

During field operations, quality control test results and periodic inspections shall be used to ensure the quality of all materials and workmanship. All equipment used in placing, finishing, and compacting shall be inspected to ensure its proper operating condition and to ensure that all such operations are in conformance to the technical specifications and are within the plan dimensions, lines, grades, and tolerances specified.

Documentation

The Contractor shall maintain current quality control records of all inspections and tests performed. These records shall include factual evidence that the required inspections or tests have been performed, including type and number of inspections or tests involved; results of inspections or tests; nature of defects, deviations, causes for rejection, etc.; proposed remedial action; and corrective actions taken.

These records must cover both conforming and defective or deficient features and must include a statement that all supplies and materials incorporated in the work are in full compliance with the terms of the contract. Legible copies of these records shall be furnished to the Engineer daily. The records shall cover all work placed subsequent to the previously furnished records and shall be verified and signed by the Site Superintendent or approved company representative.

Specific Contractor quality control records required for the contract shall include, but are not necessarily limited to, the following records:

Daily inspection reports

Each Contractor quality control technician shall maintain a daily log of all inspections performed for both Contractor and subcontractor operations. These technician's daily reports shall provide factual evidence that continuous quality control inspections have been performed and shall, as a minimum, include the following:

- (1) Technical specification item number and description
- (2) Compliance with approved submittals
- (3) Proper storage of materials and equipment
- (4) Proper operation of all equipment
- (5) Adherence to plans and technical specifications
- (6) Review of quality control tests
- (7) Safety inspection.

The daily inspection reports shall identify inspections conducted, results of inspections, location and nature of defects found, causes for rejection, and remedial or corrective actions taken or proposed.

The daily inspection reports shall be signed by the responsible quality control technician and the Program Administrator. The Engineer shall be provided at least one copy of each daily inspection report on the workday following the day of record.

Daily test reports

The Contractor shall be responsible for establishing a system that will record all quality control test results. Daily test reports shall document the following information:

- (1) Technical specification item number and description
- (2) Test designation
- (3) Location
- (4) Date of test
- (5) Control requirements
- (6) Test results
- (7) Causes for rejection
- (8) Recommended remedial actions
- (9) Retests

Test results from each day's work period shall be submitted to the Engineer prior to the start of the next day's work period. When required by the technical specifications, the Contractor shall maintain statistical quality control charts. The daily test reports shall be signed by the responsible quality control technician and the approved company representative.

Surveillance by the Engineer

All items of material and equipment shall be subject to surveillance by the Engineer at the point of production, manufacture or shipment to determine if the Contractor, producer, manufacturer or shipper maintains an adequate quality control system in conformance with the requirements detailed here and the applicable technical specifications and plans. In addition, all items of materials, equipment and work in place shall be subject to surveillance by the Engineer at the site for the same purpose.

Surveillance by the Engineer does not relieve the Contractor of performing quality control inspections of either on-site or off-site Contractor's or subcontractor's work.

It is the responsibility of the Contractor to coordinate his schedule with the Engineer, or his representative, to provide sufficient notice for the coordination and scheduling of acceptance testing. Failure to adequately coordinate the schedule and field work will not constitute a basis for delay by the Contractor.

Noncompliance

The Engineer will notify the Contractor of any noncompliance with any of the foregoing requirements. The Contractor shall, after receipt of such notice, immediately take corrective action. Any notice, when delivered by the Engineer or his or her authorized representative to the Contractor or his or her authorized representative at the site of the work, shall be considered sufficient notice.

In cases where quality control activities do not comply with either the Contractor Quality Control Program or the contract provisions, or where the Contractor fails to properly operate and maintain an effective Quality Control program, as determined by the Engineer, the Engineer may:

- (1) Order the Contractor to replace ineffective or unqualified quality control personnel or subcontractors.
- (2) Order the Contractor to stop operations until appropriate corrective actions are taken.

PSP-23 DEMOLITION

This item shall include demolition of pavement (asphalt/concrete), removal of signs, runway/taxiway lights, concrete duct banks, cable, foundations and all miscellaneous items of work depicted in the project plans.

The Contractor is advised that the existing pavement and sub-base sections on the project may vary. Pavement sections include double layer asphalt surface with variable depth sub-base material including asphalt, crushed aggregate and concrete.

The existing asphalt concrete pavement to be removed shall be cut to the full depth of the bituminous material around the perimeter of the area to be removed. The pavement shall be removed so the joint for each layer of pavement replacement is offset 1 foot (30 cm) from the joint in the preceding layer. All material shall be removed from the airport and hauled off site.

Payment for demolition of pavement and other miscellaneous items shall include removal and off-site disposal of all pavement layers, as specified, measured once at the existing pavement surface. This shall also include the off-site disposal of all broken concrete, piping, and all waste or unwanted debris. The contractor is required to store all owner materials including, but not limited to, signs, lights, etc. in a safe location at the direction of the owner.

This price shall be full compensation for furnishing all materials and for all removal, preparation, excavation, demolition, and saw cutting required to complete the item as shown on the plans; and for all labor equipment, tools and incidentals necessary to complete the demolition of the site.

Payment will be made under:

Demolition

Per Lump Sum

PSP-24 MAINTENANCE OF TRAFFIC

Description

This work shall consist of maintaining traffic and protecting workers through temporary work areas, maintaining public and private entrances and mailbox access, constructing and obliterating temporary traffic controls, providing positive guidance to the traveling public within the limits of the work area. All work shall be in accordance with the *Virginia Work Area Protection Manual (VWAPM)*, the *Virginia Supplement to the MUTCD*, the *MUTCD*, the Standard Drawings, and the Contract, as directed by the Engineer.

The Contractor shall schedule and perform the Work in a manner that provides minimum interference and maximum protection for public traffic. The Contractor shall build stabilized construction entrances in work areas where there is a potential for work vehicles to track material from the work site onto a paved surface. Material that is spilled or tracked onto the traveled pavement during prosecution of the work shall be promptly removed.

The Contractor shall maintain traffic control devices throughout construction requiring their use, which shall include but not be limited to, repositioning displaced devices, replacing due to inadequate structural integrity, replacing due to loss of reflectivity, replacing broken supports, repositioning leaning signs so they are plumb and the sign face is perpendicular to the pavement edge, cleaning dirty devices, replacing and repositioning due to weather related conditions, and replacing stolen, vandalized or damaged devices. Safety and protective devices furnished by the Contractor shall remain the property of the Contractor and shall be removed from the project site upon completion of the work or as directed by the Engineer.

The Contractor shall inspect all temporary traffic control devices, barriers, and other safety devices daily and periodically throughout the day.

This price shall be full compensation for furnishing all materials and for all coordination, implementation, providing materials, removal of devices, and permitting, required to complete the item as shown on the plans; and for all labor equipment, tools and incidentals necessary to effectively perform the maintenance of traffic onto the property from Ramoth Church Road.

Payment will be made under:

Maintenance of Traffic

Per Lump Sum

PSP-25 FENCE DEMOLITION

The Contractor shall demolish and remove all fencing as noted in the plans including, but not limited to, gates, posts, fabric, grounding and all other miscellaneous fence items required and noted in the plans.

This price shall be full compensation for furnishing all materials and for all removal, preparation, and demolition required to complete the item as shown on the plans; and for all labor equipment, tools and incidentals necessary to complete the fence removal.

Payment will be made under:

PSP-26 ENGINEER'S FIELD OFFICE

The General Contractor shall provide and maintain a field office for the exclusive use of the ENGINEER as described herein. The field office shall not be shared with Contractor staff and is to remain on the project site and be maintained for the duration of this Contract, or until such time that the Contract is completed and accepted by the ENGINEER. The Contractor shall provide materials, equipment, and workmanship of the quality which will provide an installation requiring only normal maintenance, for the duration of the Contract. After completion and acceptance of this Contract, the field office shall be the property of the Contractor.

The Contractor shall maintain the office and all appurtenances throughout the duration of this Contract until he has received written acceptance of this Contract work. In the event of a contractor requested project shutdown due to weather, the cost for maintaining the field office will be the responsibility of the contractor. No additional compensation will be provided for utilities, rental fees or maintenance of the office.

The office shall be cleaned (mopped, vacuumed, swept) and trash emptied on a weekly basis. This work must be performed as required to the satisfaction of the ENGINEER during all stages of the work.

The field office shall have a locking door and be equipped with the following items:

• Electrical Power	• Water Cooler
• Heat / AC	• Printer/Scanner/Fax/Copier Machine & Replacement Ink
• Lighting	• Internet Service
• Telephone Service	• Sanitary Facility
• 6' x 3' Desk	• Trash Can
• Desk Chair	

THE FIELD OFFICE SHALL BE ON-SITE WITH ALL ITEMS LISTED ABOVE OPERATIONAL BY THE BEGINNING OF THE FIRST DAY OF CONSTRUCTION (CALENDAR DAY 1).

Written acceptance of the Contract work shall include written final acceptance of the field office facility. The field office and all appurtenances shall be in good repair and good operating condition throughout the project. Any costs for repair or replacement shall be the responsibility of the Contractor. The Contractor's obligation for maintenance will not cease until he has received

written acceptance of the job by the ENGINEER. The field office and all appurtenances will then become the property of the Contractor.

The field office shall be placed at a location in the staging area as approved by the ENGINEER. The location shall be selected which will be convenient to the Contractor's on-site headquarters and which will not conflict with his plan of operation or the operation of subsequent Contractors.

The monthly utility bills shall be paid by the Contractor.

The Contractor shall provide and maintain for the duration of his Contract an all-weather driveway and a parking area for minimum of five cars. The field office shall be equipped with equipment of medium quality capable of withstanding normal wear and tear for the Contract duration. Any equipment which fails or becomes unusable due to normal wear and tear shall be replaced by the Contractor with a new piece of like equipment meeting the above requirements.

PSP-27 BLOCK RETAINING WALL

The Contractor shall furnish and install the retaining wall in accordance with the details and locations as shown on the plans. All necessary materials shall be included in the retaining wall price, to include but not be limited to wall blocks, geogrid, concrete, mortar, reinforcing bars, filter fabric, underdrains, anchors, and No. 57 stone.

The Contractor shall furnish the wall manufacturer's complete drawings for the retaining wall, suitable for approval by the locality. Plans shall be certified by a professional licensed to do business in the state of Virginia. The manufacturer's details and certified plans shall be submitted to the owner for review. Sufficient copies should be anticipated for standard regulatory review and permits. Obtaining all approvals and permits is the responsibility of the Contractor. The items noted in this specification and plans are minimum requirements and shall not be construed as final. Elements of work requiring more strict construction materials or design shall be determined by the manufacturer/architect as part of the permitting. Acceptable manufacturers include Cornerstone 100, Rockwood Retaining Walls, or approved equivalent. Final color of block shall be selected by the Owner from a standard color chart prior to ordering.

Geotechnical boring data has been provided in these specifications. Any additional information required to complete the design shall be included in the lump sum cost.

METHOD OF MEASUREMENT

Retaining wall construction, design, foundation construction including excavation will be measured by the linear foot as an accepted retaining wall including supplying all materials, installation of all items, plan approvals and all other incidental items and those as stated in these specifications. The Owner will secure permits for the construction.

The bidder is expected to carefully examine this performance specification in conjunction with the plans and technical specifications. He shall satisfy himself as to the character, quality, and quantities of work to be performed, materials to be furnished, and as to the requirements of this performance specification. The intent of this performance specification is to provide for construction and completion, in every detail, of the work described within this specification.

BASIS OF PAYMENT

The linear foot price shall be full compensation for design, plan preparation and for providing and installing the retaining wall system, and for all labor, equipment tools, and incidentals necessary to complete the item to the satisfaction of the Engineer. The work shall include assisting the owner with securing permits, local plan approval, site work needed for wall construction, foundation, foundation design (as applicable). All materials shall be new and unused and free from defects and imperfections and installed in a diligent and first-class workmanship-like manner.

PSP – 28 EQUIPMENT RACK

Description.

This work shall include providing and installing a complete equipment rack to include all elements shown in the project plans including, but not be limited to, meter base, Unistrut framing, conduits, cables, trenching, lightning protection, grounding rods, and concrete foundation/footings in accordance with these specifications and in reasonably close conformity to the lines and grades shown on the plans or as established by the Engineer.

General

a. All equipment and materials covered by referenced specifications shall be subject to acceptance through manufacturer's certification of compliance with the applicable specification when requested by the Engineer.

b. Manufacturer's certifications shall not relieve the Contractor of the responsibility to provide materials per these specifications and acceptable to the Engineer. Materials supplied and/or installed that do not comply with these specifications shall be removed, when directed by the Engineer and replaced with materials that comply with these specifications, at the Contractor's cost.

c. All materials and equipment used to construct this item shall be submitted to the Engineer for approval prior to ordering the equipment. Submittals consisting of marked catalog sheets or shop drawings shall be provided. Submittal data shall be presented in a clear, precise and thorough manner. Original catalog sheets are preferred. Photocopies are acceptable provided they are as good a quality as the original. Clearly and boldly mark each copy to identify products or models applicable to this project. Indicate all optional equipment and delete non-pertinent data. Submittals for components of electrical equipment and systems shall identify the equipment for which they apply on each submittal sheet. Markings shall be made bold and clear with arrows or circles

(highlighting is not acceptable). The Contractor is solely responsible for delays in project that accrue directly or indirectly from late submissions or resubmissions of submittals.

d. The data submitted shall be sufficient, in the opinion of the Engineer, to determine compliance with the plans and specifications. The Engineer reserves the right to reject any and all equipment, materials or procedures that do not meet the system design and the standards and codes specified in this document.

e. All equipment and materials furnished and installed under this section shall be guaranteed against defects in materials and workmanship for a period of at least [twelve (12) months] from final acceptance by the Owner. The defective materials and/or equipment shall be repaired or replaced, at the Owner's discretion, with no additional cost to the Owner.

Equipment and Materials

- (a) **Hydraulic cement concrete** - Concrete for equipment foundations shall conform to the most current version of the VDOT Road and Bridge Specifications, Section 217, Type A3 General.
- (b) **Cabling** - Wire for electrical circuits up to 600 volts shall comply with AC 150/5345-7F Specification L-824 and/or Federal Specification J-C-30 and shall be type THWN-2, 75°C. Cable type, size, number of conductors, strand and service voltage shall be as specified in the Contract Document.
- (c) **Grounding Wire** - Wire for ground installations shall be No. 6 AWG insulated stranded for ground wire per ASTM B3 and ASTM B8, and shall be bare copper wire per ASTM B33. For voltage powered circuits, the equipment ground conductor shall be minimum No. 6 AWG, 600V rated, Type XHHW insulated, green color, stranded copper equipment ground conductor.
- (d) **Ground rods** - Ground rods shall be copper-clad steel. The ground rods shall be of the length and diameter specified on the plans, but in no case less than 10 feet long and 3/4 inch in diameter.
- (e) **Steel Channel** – Steel channel shall be a 12-gauge, 1 ½ -inch x 1 ½ - inch stainless steel channel.
- (f) **Concrete foundation course** shall be aggregate No. 57 conforming to the requirements of Section 203 of the VDOT Road and Bridge Specifications.
- (g) **Plastic conduit.** Plastic conduit and fittings shall conform to the following requirements:
 - UL 514B covers W-C-1094-Conduit fittings all types, classes 1 thru 3 and 6 thru 10.
 - UL 514C covers W-C-1094- all types, Class 5 junction box and cover in plastic (PVC).

- UL 651 covers W-C-1094-Rigid PVC Conduit, types I and II, Class 4.
- UL 651A covers W-C-1094-Rigid PVC Conduit and high-density polyethylene (HDPE) Conduit type III and Class 4.

Underwriters Laboratories Standards UL-651 and Article 352 of the current National Electrical Code shall be Type II–Schedule 40 PVC suitable for either above ground or underground use.

Measurement and Payment.

The installation of the equipment rack will be measured as a lump sum item of payment to include the complete installation of the steel channel, foundation, conduits, cabling, lightning protection, meter base, and all other items of work shown in the Equipment Rack detail included in the construction plans. The work shall be completed as per local code, the current version of the National Electric Code and to the satisfaction of the Engineer. The lump sum price shall include furnishing all materials and for all preparation, all labor, equipment, tools, and incidentals necessary to complete this item.

Payment will be made under:

Pay Item	Pay Unit
Equipment Rack	Lump Sum

PSP – 29 USE OF EXPLOSIVES

When the use of explosives is necessary for the execution of the work, the Contractor shall exercise the utmost care not to endanger life or property, including new work. The Contractor shall be responsible for all damage resulting from the use of explosives.

All explosives shall be stored in a secure manner in compliance with all laws and ordinances, and all such storage places shall be clearly marked. Where no local laws or ordinances apply, storage shall be provided satisfactory to the RPR and, in general, not closer than 1,000 feet (300 m) from the work or from any building, road, or other place of human occupancy.

The Contractor shall notify each property Owner and public utility company having structures or facilities in proximity to the site of the work of their intention to use explosives. Such notice shall be given sufficiently in advance to enable them to take such steps as they may deem necessary to protect their property from injury.

The use of electrical blasting caps shall not be permitted on or within 1,000 feet (300 m) of the airport property.

PSP – 29 NORTHERN VIRGINIA ELECTRIC COOPERATIVE (NOVEC) POWER IMPROVEMENTS

The lump sum price for this item shall be full compensation for providing and installing a NOVEC pull box, NOVEC 3-phase enclosure box, transformer pad, concrete covers, varying size conduits,

fittings, backfill, and for all labor, equipment, tools, and incidentals necessary to complete the installation as per the details included in the plans and to the satisfaction of the Owner's Project Manager and NOVEC. The work shall include purchasing the pull box, 3-phase enclosure, and all other required materials from NOVEC. The contractor shall coordinate directly with NOVEC for determining the costs associated with the equipment and materials. All materials shall be new and unused and free from defects and imperfections and installed in a diligent and first-class workmanship-like manner. All materials and equipment shall be installed as per the latest edition of the NOVEC Electricians Guide.

PSP – 30 CONSTRUCTION SURVEY

Horizontal and vertical survey control has been established and is noted in the construction plans. The establishment of Survey Control and/or reestablishment of survey control shall be by a State Licensed Land Surveyor. Contractor is responsible for preserving integrity of horizontal and vertical controls established in the plans. In case of negligence on the part of the Contractor or their employees, resulting in the destruction of any horizontal and vertical control, the resulting costs will be deducted as a liquidated damage against the Contractor.

Prior to the start of construction, the Contractor will check all control points for horizontal and vertical accuracy and certify in writing to the Owner's Project Manager that the Contractor concurs with survey control established for the project. All lines, grades and measurements from control points necessary for the proper execution and control of the work on this project will be provided to the Owner's Project Manager. The Contractor is responsible to establish all layout required for the construction of the project.

Copies of survey notes will be provided to the Owner's Project Manager for each area of construction and for each placement of material as specified to allow the Owner's Project Manager to make periodic checks for conformance with plan grades, alignments and grade tolerances required by the applicable material specifications. Surveys will be provided to the Owner's Project Manager prior to commencing work items that cover or disturb the survey staking. Survey(s) and notes shall be provided in the following format: Auto CAD Civil 3D, 2013 or 2019.

Laser, GPS, String line, or other automatic control shall be checked with temporary control as necessary. In the case of error, on the part of the Contractor, their surveyor, employees or subcontractors, resulting in established grades, alignment or grade tolerances that do not concur with those specified or shown on the plans, the Contractor is solely responsible for correction, removal, replacement and all associated costs at no additional cost to the Owner.

No direct payment will be made, unless otherwise specified in contract documents, for this labor, materials, or other expenses. The cost shall be included in the price of the bid for the various items of the Contract.

PSP-31 KNOX-BOX SERIES 3200 (LOCK BOXES)

The Contractor shall provide and install Knox-Box Series 3200 Lock Box conforming to the locations noted in the project plans. The lock box shall be a surface mount, hinged box with black finish. The box is pre-drilled in the back, so it can be mounted on existing and proposed fence

post by U-Clamps recommended by the manufacturer. Installation shall also conform to all state and local requirements. The per each price shall be full compensation for furnishing all materials; and for all labor, equipment, tools and incidentals necessary to complete the item.

Pay Item	Pay Unit
Knox Box	Per Each

PSP-32 UTILITY INSTALLATION

This work shall consist of furnishing and installing necessary materials for water distribution systems and sanitary systems in accordance with these specifications and in conformity to the dimensions, lines, and grades shown on the plans or as established by the Engineer. All utility work shall conform to the requirements of the American National Standards Institute (ANSI), American Water Works Association (AWWA), the National Plumbing Code (NPC), and standards set forth in the Town of Leesburg Design & Construction Standards Manual. The representative unit prices shall be full compensation for furnishing all materials and for all preparation, transportation, sealing, disinfecting, and testing of the materials and for all labor, equipment, tools, and incidentals necessary to complete this item to the satisfaction of the Owner's Project Manager and the Town of Leesburg inspections.

Tie-ins to existing utilities (water and sanitary) shall include all coordination with the Town of Leesburg, excavation, saw-cutting of pavement and curb (waterline installation), milling, physical tie-in to the utility, coring of sanitary manhole (sewer), backfill and compaction of trench, paving, marking and final cleanup.

PSP-34 SIGN PANELS

This work shall consist of fabricating, furnishing, and erecting signs as specified on the plans or elsewhere in the contract. Signs shall be fabricated of aluminum 0.100-inch in thickness and shall be smooth, flat, and free of metal burrs and splinters. Signs shall meet all requirements as noted in the project plans.

Steel post shall be a galvanized u-channel post meeting the dimensions noted in the plans.

The per each price shall be full compensation for furnishing all materials including sign panel and signpost; and for all labor, equipment, tools, and incidentals necessary to complete the item to the satisfaction of the Owner's Project Manager.

Payment will be made under:

Sign Panel per each

PSP-35 AUTO PARKING BUMPER BLOCKS

This work shall include providing and installing pre-manufactured concrete bumper blocks in accordance with these specifications and in conformity to the locations shown on the plans or as established by the Engineer. The hydraulic cement concrete shall conform to VDOT Class A3 (3,000 psi) and shall be installed as per the project plans.

The per each price shall be full compensation for furnishing all materials including bumper block and anchors; and for all labor, equipment, tools, and incidentals necessary to complete the item to the satisfaction of the Owner's Project Manager.

Payment will be made under:

Auto Parking Bumper Block per each

PSP-36 AIRCRAFT TIE-DOWN ANCHORS

After paving operations are complete, the Contractor shall provide and install tie-down anchors to the requirements and at the locations shown on the plans. The per each price shall be full compensation for furnishing all materials; and for all labor, equipment, tools, and all incidentals necessary to complete the item.

Payment will be made under:

Tie-Down Anchors per each

PSP-35 GATE RELOCATION

The contractor shall re-install the existing gate removed as part of the demolition (See Existing Conditions and Demolition Sheet). The contractor shall provide new corner posts and install the gate at the location and as per the details included in the plans.

The lump sum price shall be full compensation for furnishing all materials including posts, concrete; and for all labor, equipment, tools, and incidentals necessary to complete the item to the satisfaction of the Owner's Project Manager.

Payment will be made under:

Gate Relocation lump sum

PSP-36 LANDSCAPING

The contractor shall trees and bushes in the quantities shown on the planting schedule noted on the site plan. All trees and bushes shall be installed as per the Town of Leesburg Landscaping Specification and noted in the items of work in the Invitation for Bid.

The lump sum price shall be full compensation for furnishing all materials including trees, bushes, stakes, maintenance; and for all labor, equipment, tools, and incidentals necessary to complete the item to the satisfaction of the Owner's Project Manager.

Payment will be made under:

Landscaping lump sum

PSP-37 STORMWATER MANAGEMENT FACILITY

The Contractor shall provide and install an underground stormwater management facility system as shown on the plans and as manufactured by Advanced Drainage Systems, Forterra (Bio Clean), StormTrap, or approved equivalent.

The lump sum price for the complete detention system shall be full compensation for furnishing all materials (including but not limited to arched pipe, aggregate, fittings, underdrains, backfill material, and impermeable liner); and for all labor, equipment, tools, and incidentals necessary to complete the item.

Payment will be made under:

Stormwater Management Facility lump sum

PSP-38 MANUFACTURED TREATMENT DEVICE (STR 17)

The Contractor shall provide and install manufactured treatment device as shown on the plans and as manufactured by Advanced Drainage Systems, Forterra (Bio Clean), StormTrap, or approved equivalent.

The lump sum price for the complete unit shall be full compensation for furnishing all materials (including but not limited to structure, fittings, filtering media, backfill material; and for all labor, equipment, tools, and incidentals necessary to complete the item.

Payment will be made under:

Manufactured Treatment Device (STR 17) lump sum

END OF PROJECT SPECIAL PROVISIONS

ITEM B-101

T-HANGAR AND CORPORATE HANGAR BUILDINGS GENERAL REQUIREMENTS (Performance Specification)

TABLE OF CONTENTS

101-1.1 Scope of Work.....	B-101-3
101-1.2 Drawings	B-101-3
101-2.1 Work Schedule and Coordination	B-101-4
101-2.2 Special Inspections	B-101-4
101-2.3 Certified Drawings	B-101-5
101-2.4 Clearing	B-101-5
101-2.5 Lines and Grades	B-101-5
101-2.6 Erosion Control	B-101-5
101-2.7 Grading and Filling (Building Pad Only)	B-101-5
101-2.8 Excavation	B-101-6
101-2.9 Dewatering	B-101-6
101-2.10 Concrete.....	B-101-6
101-2.11 Curing.....	B-101-7
101-2.12 Reinforcing.....	B-101-7
101-2.13 Floor Covering	B-101-8
101-2.14 Guarantee of Work	B-101-8
101-2.15 Record Drawings	B-101-8
101-3 Building (T-Hangar & Corporate Hangar)	B-101-9
101-3.1 General	B-101-9
101-3.2 Design Loads	B-101-9
101-3.3 Structural Framing	B-101-9
a) Rigid Frames, Wing Unit Frames, and Canopy Beams.....	B-101-10
b) Bearing End Frames	B-101-10
c) End Wall Columns	B-101-10
d) Purlins and Girts.....	B-101-10
e) Eave Struts.....	B-101-10
f) Wind Bracing	B-101-11
g) Flange Bracing	B-101-11
h) Base Support	B-101-11
i) Framed Openings	B-101-11
j) Painting	B-101-11
101-3.4 Roof and Walls	B-101-11
a) Standard Roof Profiles.....	B-101-11
b) Standard Panel Properties (Roof, Wall, Partition & Liner)	B-101-12
c) Fasteners	B-101-13
d) Sealer.....	B-101-13
e) Installation of Roof and Wall Panels	B-101-13

f) Flashing, Closures, and Trim.....	B-101-14
g) Color Finish.....	B-101-14
h) Insulation (Corporate Hangar)	B-101-15
i) Interior Doors	B-101-15
j) Interior Doors (Bathroom and Storage Room)	B-101-15
k) Exterior Doors (Storefront Door and Maintenance Storage)	B-101-16
101-3.5 Building Anchorage and Foundation.....	B-101-16
a) Anchor Bolts.....	B-101-16
b) Foundation.....	B-101-16
101-3.6 Building Specifications.....	B-101-17
a) Administration.....	B-101-17
b) Building Classification.....	B-101-18
c) Construction Classification.....	B-101-19
d) General Building Limitations.....	B-101-19
e) Means of Egress	B-101-19
f) Fire Protection.....	B-101-19
g) Structural Loads	B-101-19
h) Interior Building Components.....	B-101-20
i) Exterior Building Components.....	B-101-22
j) Fire Suppression System	B-101-24
k) T-Hangar Bathrooms.....	B-101-24
l) Storage Room.....	B-101-28
m) Vestibule	B-101-29
n) Hangar Bay Infrared Heating (Bid Additive)	B-101-29

METHOD OF MEASUREMENT.....B-101-30

101-4.1 26-Unit T-Hangar	B-101-30
101-4.2 Corporate Hangar (3-60' X 60')	B-101-30
101-4.3 Corporate Hangar Bay Infrared Heating (Bid Additive)	B-101-31
101-4.4 Corporate Hangar Epoxy Coated Floor (Bid Additive)	B-101-31

BASIS OF PAYMENT.....B-101-31

101-1.1 SCOPE OF WORK

The scope of work covers furnishing, installation, and erection of the necessary materials for:

1. One (1) pre-engineered metal building (aircraft hangar) to include 26 nested T-hangar units, two ADA compliant bathrooms, waiting area, storage closet and separate equipment storage room.
2. One (1) pre-engineered metal building (aircraft hangar) to include 3 – 60' x 60' box hangars.

The scope of work shall include concrete floor/foundation, interior and exterior lighting components, structural framing, roof and wall cover, trim and closures, and accessories herein after described. The buildings shall be weatherproofed and easily erected and shall meet all requirements of the applicable 2012 ICC International Building Code (2012 IBC), the Virginia Uniform Statewide Building Code (latest edition), all current local and state codes, all local energy codes and be ADA compliant. Where conflicts occur with the standards and the requirements set forth herein, the more stringent requirements shall govern. It is the responsibility of the Contractor to research and verify that the most current design criteria are met with regards to building loads (Loudoun County) including but not limited to snow loads and wind loads. "As built" documentation shall be delivered to the Owner's Project Manager upon completion of the construction.

The work shall include plan preparation, local building plan approval, foundation design, concrete foundation construction, structural framing, erection, adequate flashing, electrical design, electrical plan preparation, electrical installation, roofing, gutters, siding, anchor bolts, door hardware, fasteners, caulk, and any other component parts for the building, as specified, and erection/installation of the same. All materials shall be new and unused and free from defects and imperfections and fabricated in a diligent and first-class workmanship-like manner.

101-1.2 DRAWINGS

The Contractor shall furnish the building manufacturer's complete erection drawings, structural drawings, foundation drawings, electrical & plumbing drawings and any other drawing deemed necessary for the hangar and suitable for approval by the Town of Leesburg and submission to Loudoun County for building permits. Plans shall be certified by a professional licensed to do business in the state of Virginia. The manufacturer's details and all design plans shall be submitted to the Owner's Project Manager for review. Sufficient hard copies should be anticipated for standard regulatory review and permits. The Contractor is responsible for assisting the Owner with securing the building permit including local research, completing all applications and providing hard copies of all necessary documentation for building permit submission. The Contractor will be

responsible for obtaining all trade permits including plumbing, electrical, etc. and paying any required permit fees. The items noted in this specification are minimum requirements and shall not be construed as final. Elements of work requiring more strict construction materials or design shall be determined by the Contractor and his team and included in the bid.

101-2.1 WORK SCHEDULE AND COORDINATION

The Contractor shall coordinate all work schedules with the owner's project manager. Work hours should generally be restricted to between sunrise and sunset, Monday through Friday. Expanded work hours shall be coordinated with the Owner. No additional compensation will be allowed for overtime. Contractors work shall not interfere with access to other hangars, taxiways, or other airport facilities for airport personnel, tenants, or patrons. The Contractor shall be responsible for coordinating all required inspections. Inspections shall be scheduled during normal business hours of the regulatory agency.

Storage of materials and the placing of the Contractor's plant and equipment shall be at locations approved by the Owner. Materials shall be stored by the Contractor as to insure the preservation of their quality and fitness for the work. Excess construction materials shall be removed from the airport and disposed of in accordance with all applicable local, state, and federal requirements.

101-2.2 SPECIAL INSPECTIONS

The Contractor shall be responsible for coordinating and providing inspections required by the 2012 ICC International Building Code or local building codes. The Contractor shall provide the Owner's Project Manager with copies of all quality control and special inspections testing reports required for local building construction approval.

The Contractor shall be responsible for independent inspections for certified compliance of elevations for final coordination with the FAA and the Obstruction Evaluation / Airport Airspace Analysis (OE/AAA) process. This includes finished floor elevations and eave heights at all four corners and centerline of roof peak.

The Contractor shall keep on the job, during its progress, a competent Superintendent with experience in steel building erection and any necessary assistants, all satisfactory to the Owner's Project Manager. The Superintendent(s) shall not be changed except with the consent of the Owner's Project Manager unless the superintendent proves to be unsatisfactory to the Contractor or ceases to be his employee. The Superintendent shall represent the Contractor in his absence and all directions given to him shall be as binding as if given to the Contractor. Important directions shall be confirmed upon written request in each case. The Contractor shall give efficient supervision of the work, using his best skill and attention.

101-2.3 CERTIFIED DRAWINGS

Building, structural, mechanical, electrical, and plumbing drawings shall be prepared by the Contractor's design team in conjunction with the building manufacturer. The plans shall be stamped and certified by professionals licensed to do business in the state of Virginia.

101-2.4 CLEARING

The Contractor shall be responsible for removal of debris, topsoil, and subsoil as required, to meet grade elevations and dimension requirements as specified and as shown in the associated site plan. Excess excavated materials shall be removed as noted in the site plan in accordance with all applicable local, state, and federal requirements unless otherwise coordinated with the Owner' Project Manager.

101-2.5 LINES AND GRADES

The Contractor shall, at their own cost and expense, provide necessary survey services, planks, stakes, chalk lines, spikes, tools, and labor as necessary to properly place lines and grades for the construction of the work. Lines and grades for and during construction will be the responsibility of the Contractor and shall be established in accordance with the project plans.

101-2.6 EROSION CONTROL

Erosion control requirements are established in the approved site plan.

101-2.7 GRADING AND FILLING (Building Pad Only)

The Contractor shall be responsible for all grading to achieve compaction in the building foundations as designed by the Contractor's structural Engineer. Grade shall be smooth and even, free of voids, compacted as specified, and to the required elevation. Provide final grades with a 1/4" tolerance when tested with a 10' straightedge. Final foundation depth shall be determined by the Contractor's structural Engineer (see 101-2.10).

The contractor shall perform his grading operations to ensure that the subgrade elevation for the final finish floor is achieved without over excavating. Additional fill/earthworks needed to fill and compact these areas due to over excavation shall be at the contractor's expense.

101-2.8 EXCAVATION

All excavations shall be protected against caving, at the Contractors own cost and expense, and the Contractor shall always protect the work contained therein from damage from weather and all other causes. Care should be taken by the Contractor to protect the existing subgrades once they are exposed. During foundation preparation efforts, the Contractor shall take all necessary measures to protect the exposed subgrade from rainfall and other sources of unwanted water as recommended in the geotechnical report. This shall include shaping and rolling to seal off the surface when rain is imminent, and timely pumping from appropriately sized temporary sumps. A copy of the geotechnical report is included in Appendix C of the project specifications.

101-2.9 DEWATERING

When water is encountered, the Contractor shall, at their own expense, provide proper pumping equipment and construct such slumps and ditches as are necessary to keep all excavations clear from water. Under no circumstances shall any masonry construction or work of any description be carried on when water is covering any part of same. Dewatering shall not affect usage of adjacent facilities.

Construction forms may be of metal or timber. If of timber, the faces in contact with finished surfaces of the concrete must be planed smooth and be clean. Forms must be so anchored, braced and supported as to be rigid and insure against failure or distortion of the contained concrete during the process of pouring and curing.

It is required that all forms be accurately set to line and grade, and in accordance with the structural dimensions shown upon the Contractor provided plans, and as specified by the Building Fabricator. Any deviation from such lines and grades will be sufficient cause for the condemnation of such crooked and irregular parts of the work, and the Contractor will be required to tear out and reconstruct such work at their own expense.

101-2.10 CONCRETE

Concrete must be obtained from an approved ready-mix supplier. Concrete must comply with ASTM C 94; ACI 301, ACI 318 and CRSI's "Manual of Standard Practice".

Coarse aggregate may be either crushed stone or gravel, washed and free of all vegetative or organic matter, clay, sand or other impurities. The aggregate shall be graded to conform to ASTM C 33, Class 4S.

Fine aggregate shall be sand, either washed or natural bar or bank sand. It must be free from all lumps of foreign matter. The grains shall be well graded in size from the finest to the coarsest and not more than 10 percent shall pass the No. 100

sieve and no more than 80 percent the No. 16 mesh sieve. Voids shall not exceed 35 percent of the total volume.

The cement shall be Type I or II Normal Portland cement of an approved manufacturer and shall meet ASTM C 150 (3,500 psi). The water shall be potable. The concrete shall be batched and mixed in equipment approved by the Owner's Project Manager. Concrete shall be mixed to obtain a four-inch (4") slump as determined by standard field test. Should the Superintendent desire to pour with a different slump due to extreme weather conditions, the variation must be approved by the owner's project manager prior to concrete being poured. Concrete having a slump in excess of four inches (4") may be rejected by the Owner's Project Manager. The Contractor must submit a mix design with test reports showing that the mix has been successfully tested to produce concrete with the properties specified and that mix will be suitable for the job conditions.

Concrete shall be placed in such a manner as to give a minimum segregation of aggregate. Concrete shall be vibrated to ensure uniform distribution and eliminate "honey-combing." Vibration equipment must be approved by the Owner's Project Manager. The Contractor's equipment and method of placing concrete shall be approved by the Owner's Project Manager prior to placing any concrete.

All exposed floor slabs shall receive a steel trowel finish, approved hardener, and a rubbed finish to give a smooth plain surface. The building erection shall not be allowed until such time 28-day design strength of 3,000 pounds per square inch is reached. Any concrete found to be defective at any time shall be removed and replaced by the Contractor to the satisfaction of the Owner's Project Manager, at no additional expense to the Owner.

Concrete used for the building foundation construction shall be as specified by the foundation Engineer and as outlined in the foundation design provided by the Contractor. A copy of the geotechnical report is included in the project specifications.

101-2.11 CURING

All exposed concrete surfaces shall be cured as per current industry practices and standards. The type of curing process shall be presented to the Owner's Project Manager for approval prior to the placement of concrete.

101-2.12 REINFORCING

All reinforcing bars shall be domestic mild steel deformed bars conforming to ASTM A615, Grade 60. When placed in the work, steel reinforcement shall be free from dirt, paint, oil or other foreign substances; rust or mill scale will be permitted, provided hand wire-brushed samples conform to the specified requirements for weight and deformation height.

Reinforcing shall be accurately placed as indicated on the plans. Reinforcing shall have a minimum of 2 inches of cover, unless otherwise noted. Shop drawings for reinforcing steel must be approved by the Owner's Project Manager prior to fabrication.

101-2.13 FLOOR COVERING

Hangar Bay (T-Hangar and Corporate Hangar) - Base Bid - All exposed floor in the hangar bays shall receive a steel trowel finish, approved hardener, and a rubbed finish to give a smooth plain surface.

Hangar Bay (Corporate Hangar) - Bid Additive

The concrete floor shall be painted with a white or gray two-part 100% solids epoxy floor covering (color to be approved by the Owner). The concrete shall have a surface profile of CSP 1-3 prior to installation of the floor system. The standard system shall include a primer (installed at 6-8 mils DFT), a topcoat of epoxy (installed at 10-14 mils DFT) and a finish coat of polyurethane enamel installed at 2-3 mils DFT with aggregate consistent with a 80/120 mesh. The system shall be chemical resistant and shall be installed per the selected manufacturer's recommendations. Moisture vapor mitigation should be assessed by the designer and included in the bid should the designer determine it is needed for an acceptable floor system application.

Bathrooms, Storage Area and Vestibule – 12” x 24” x 5/16” ceramic tile and base molding meeting the requirements of ANSI A137.1 “Specifications for Ceramic Tile”.

Maintenance Storage Area - Base Bid - All exposed floor shall receive a steel trowel finish, approved hardener, and a rubbed finish to give a smooth plain surface.

101-2.14 GUARANTEE OF WORK

See Town of Leesburg General Conditions Section 4.7

101-2.15 RECORD DRAWINGS

See Town of Leesburg General Conditions Section 4.13

101-3 BUILDING (T-Hangar & Corporate Hangar)

101-3.1 GENERAL

All structural steel sections and welded plate members shall be designed in accordance with the latest editions of AISC Specifications for the Design, Fabrication, and Erection of steel for Buildings. All cold form structural members and exterior covering shall be designed in accordance with the latest edition of AISC Specifications for the Design of Cold-Formed Structural Members.

The buildings shall be supplied by a manufacturer who is regularly engaged in the manufacturer of pre-engineered metal buildings and compatible doors. No specific manufacturer has been specified. All specifications noted are the minimum requirements established for this project and shall be followed for both buildings unless otherwise noted.

101-3.2 DESIGN LOADS

The building shall be designed to the Load Combinations specified in the MBMA Low Rise Building Systems Manual latest edition.

Roof live loads shall be applied to the horizontal roof projection. Wind Loads shall be assumed to act horizontally and shall be applied as pressure and suction in accordance with the applicable section of the UBC, SBC, MBMA or other building codes used in the design criteria.

Design shall include the building Dead Load, the Roof Live Load, Wind and Seismic Load in accordance to the building code specified.

101-3.3 STRUCTURAL FRAMING

GENERAL (T-Hangar & Corporate Hangar)

All framing members shall be shop fabricated for bolted field assembly. Primary structural framing shall include the transverse rigid frame, wing unit rafter beams and columns, canopy beams, intermediate columns, bearing and frames, end wall columns, and wind bracing. Secondary structural framing shall include purlins, girts, eave struts, flange bracing, sill supports, clips, and other miscellaneous structural parts. All hot rolled steel sheet, plate, and strip for built-up sections shall have minimum yield point of 50,000 psi. Hot rolled structural sections shall conform to the requirements of ASTM Specifications A-36, 12, 14, 15, 16, and 17 gage cold formed sections shall have a minimum yield point 55,000 psi and a minimum tensile strength of 68,750 psi. Galvanized sheet and strip for structural framing members shall conform to ASTM Specifications A-446, Grade A. Pipes for columns of other structural uses shall have 42,000 psi yield. Unless otherwise specified, the minimum thickness of framing members shall be as follows:

Cold-formed primary framing members	14 Gage
Cold-formed secondary framing members	16 Gage
Intermediate pipe columns	3/16"
Webs of welded built-up members	11 Gage
Flanges of welded built-up members	3/16"
Bracing (Cable standard)	1/4" dia.
Bracing (Rod optional)	2" dia.

Cold-formed sections shall be manufactured by precision roll or brake framing. Welding shall be by submerged arc or gas shielded arc process. All field connections shall be field bolted with ASTM Specification A-307 or A-325 bolts as shown in the manufacturers' drawings. Connections in secondary members shall be made with 2" truss head finish neck bolts and hex nuts (or manufacturer's standard) when required. All framing members shall carry an easily visible identifying marking.

101-3.3 a) RIGID FRAMES, WING UNIT FRAMES, AND CANOPY BEAMS

All members shall be welded, built-up I-shapes either constant depth or tapered.

101-3.3 b) BEARING END FRAMES

Bearing end frames shall be cold formed C sections. An optional bearing frame system shall be Hot Rolled Sections and consist of columns at the building corners and a continuous rafter beam supported by the end wall columns.

101-3.3 c) END WALL COLUMNS

End wall columns will consist of cold formed C sections with optional end wall columns made of hot rolled or welded built up I shapes.
End wall assemblies shall consist of cold form columns or optional hot rolled or welded columns and bypass of insert girts as design requires.

101-3.3 d) PURLINS AND GIRTS

Purlins and Girts shall be cold formed Z sections with stiffened flanges. They shall be simple (inset) or continuous span (bypass) as required by design.

101-3.3 e) EAVE STRUTS

Eave Struts shall be 8" deep cold formed sections sufficient to provide adequate backup for both roof and wall panels at the building eaves.

101-3.3 f) WIND BRACING

Insert Girt Buildings - Wind bracing in the roof and/or sidewall is not required where the diaphragm strength of the roof and/or wall covering is adequate to resist the longitudinal wind forces. If required, wind bracing shall be provided fixed base corner columns or other suitably designed bracing.

Bypass Girt Buildings - Winds bracing shall consist of diagonal bracing and shall be provided in both the roof and sidewalls as indicated in the manufacturer's drawings. Design shall include reinforcement of the purlins and eave struts as required.

101-3.3 g) FLANGE BRACING

The inside flange of all rigid frames shall be braced laterally by angles connected to the flange of the frame and to the web of the purlin or girt so that allowable compressive stress is adequate for any combination of loading.

101-3.3 h) BASE SUPPORT

A continuous member shall be provided to which the base of the wall covering may be attached. This member shall be a 14-gage galvanized angle used in conjunction with 1-1/2" sheet ledge formed in the concrete or optional 18 gage painted base trim secured to the concrete floor with power driven fasteners or equivalent anchors.

101-3.3 i) FRAMED OPENINGS

Structural framing members for all openings shall be adequate for the design wind loads established by local code.

101-3.3 j) PAINTING

Corporate Hangar Building

All structural members which are not galvanized shall be cleaned to remove all dirt, grease, oil, and loose mill scale and given two shop coats of iron oxide primer (4.0 wet mils minimum) formulated to meet the performance requirement of Federal Specification TT-P-636 and painted with two coats of interior finish paint (color to be selected by the Owner). The type of paint shall be determined by the Contractor. The selected paint shall be compatible with a steel application.

101-3.4 ROOF AND WALLS

101-3.4 a) STANDARD ROOF PROFILES

U/RS - 3/4" deep ribs 6" on center. Each sheet shall allow a 36" wide net coverage
R/RT - 1-1/4" deep ribs 12" on center with two 1/4" deep intermediate stiffeners. Each sheet shall allow a 36" wide net coverage.

A/SP - 1'1/4" deep recesses 12" on center with intermediate accent lines. 36" net coverage wall panels only.

Snow Guards shall be installed on the east and west sides of the roof. Snow guards shall be selected that are suitable for use with the type of roof being installed. The contractor shall submit manufacturer's product data and one full-size snow guard in color and material selected for approval. Snow guards shall be manufactured by a company with at least 20 years' experience in manufacturing snow guards.

All materials and products shall be delivered in unopened, factory labeled packages. The material shall be stored and handled in strict compliance with manufacturer's instructions and recommendations. All materials shall be protected from damage.

Prior to the start of installation, the contractor shall inspect the condition of the roof to ensure surfaces are suitable for installation.

Snow guards shall be installed as per the manufacturer's installation instructions. Use manufacturer's recommended installation materials and installation tools. Snow guards shall be attached securely to the roof. Areas adjacent to the snow guard installation shall be cleaned at the completion of the work.

101-3.4 b) STANDARD PANEL PROPERTIES (Roof, Wall, Partition & Liner)

Corporate Hangars

Standard roof, wall, partition, and liner panels shall be 24-gage, color coated, galvanized, cold form panels. The typical height of the liner panel is approximately 7'-4" or to the first girt. The final design height shall be determined by the Contractor.

Materials for 24 gage panels shall be painted galvanized steel (80,000 psi yield) conforming to ASTM Specification A-446 Grade E.

The Owner shall approve all color selections prior to the Contractor placing any orders. Any material delivered to the site with an exterior color not approved by the Owner shall not be used in the construction and shall be replaced at the Contractor's expense.

Translucent panels shall be provided and incorporated into the wall system to allow natural sunlight into the hangar area. The translucent panels shall be manufactured from clear polycarbonate, or equivalent material, capable of preventing panel cracking. The panels shall also provide 100% UV protection and be impact resistant. A total of twenty (20) panels shall be included in the wall system and shall be evenly spaced on the three sides of the building for uniform coverage.

T-Hangar

Materials for 24 gage roof and wall panels shall be painted galvanized steel (80,000 psi yield) conforming to ASTM Specification A-446 Grade E.

The Owner shall approve all color selections prior to the Contractor placing any orders. Any material delivered to the site with an exterior color not approved by the Owner shall not be used in the construction and shall be replaced at the Contractor's expense.

Materials for 24 gage partition panels shall be galvanized steel (80,000 psi yield) conforming to ASTM Specification A-446 Grade E.

101-3.4 c) FASTENERS

1. All self-tapping fasteners shall conform to USASB18.6.4 and shall have a type A or AB thread.
2. All self-drilling fasteners shall conform to IF1113.
3. Where required for weather tightness, fasteners shall be assembled with neoprene sealing washers.
4. All fasteners shall be plated to a minimum thickness of .0005"
5. Extended corrosion resistant fasteners shall be ZAC (zinc-aluminum cast head) with aluminum and neoprene sealing washers.

101-3.4 d) SEALER

Sealer for side laps, end laps, and flashing shall be polymer sealant in extruded tape form. The sealant shall be non-shrinking, non-drying, and non-toxic and shall have superior adhesion to metals, plastics, and painted surfaces. Service range temperatures from - 30 to +300 degrees Fahrenheit. Sealer meets or exceeds the requirements of Gov. Spec. No. MIL-C 18969 Type II Class B and TT-C-1796A.

101-3.4 e) INSTALLATION OF ROOF AND WALL PANELS

1. Roof panels shall be continuous from ridge to the eave. Where laps are required, they shall be a minimum of 6" long and shall occur at a roof purlin.
2. Side wall and end wall panels shall be continuous from sill to roofline except where length becomes prohibitive for handling purposes. End wall panels for buildings with a 4:12 roof slope shall have a splice at the eave line.
3. End wall panels shall be square cut for buildings with a 1:12 slope and bevel cut for buildings with a 4:12 slope.
4. Before securing, all laps of roof panels shall be sealed with a continuous ribbon of tape sealer.
5. Roof panels shall be secured to purlins with #14 sheet metal screws at a maximum spacing of 18".

6. At end laps of rib sheets, the maximum spacing shall be 6" for U/RS sheets and on each side of the major rib for R/R/Y sheets.
7. Side laps to roof panels shall be stitched through the high flat of the rib with # 14 sheet metal screws with a maximum spacing of 18".
8. At the end laps of rib sheets, the maximum spacing should be 6" for U/RS sheets and on each side of the major rib for R/RT sheets.
9. At the side laps of sheets # 10 sheet metal screws shall be placed at a maximum of 18" on centers.

101-3.4 f) FLASHING, CLOSURES, AND TRIM

1. Flashing and/or trim shall be furnished at the rake, corners, and eaves; at framed openings and whenever necessary to provide weather tightness and a finished appearance.
2. Sculptured rake trim shall be roll formed 26 gage or optional 24 gage material 20" long to minimize joints. Other trim shall be 26-gage.
3. Sculptured rake trim shall be color coated galvanized steel conforming to ASTM Specifications S-446 Grade D (50,000 psi yield)
4. A formed panel matching the profile and slope of adjoining panels shall be provided along the building ridge.
5. Closure strips matching the profile of the panel shall be provided and installed along the rake and/or eave where required for weather tightness. Closure strips shall be closed cell, semi-rigid, cross-linked polyethylene foam laminated for strength and uniform compressibility.

101-3.4 g) COLOR FINISH

1. Exterior surfaces shall be color coated galvanized steel.
2. Color of wall panels, liner panel, and trim shall be selected, by the Owner, from standard color charts.
3. Roof panels shall be galvanized steel.
4. Gutters, rake trim, down spouts, eave trim, and door flashing shall be pre-painted galvanized. The color shall be selected by the Owner from a standard color chart. The color surface shall be a silicone polyester co-polymer resin type to give superior adhesion and durability. The coating shall be a T.D.F. of 1.0 mil thick. The reverse or backer coat shall be a parchment color, straight polyester with a T.D.F. of 0.5 mil thickness.

The Owner shall approve all color selections prior to the Contractor placing any orders. Any material delivered to the site with an exterior color not approved by the Owner shall not be used in the construction and shall be replaced at the Contractor's expense.

101-3.4 h) INSULATION (Corporate Hangar)

Provide reinforced white-faced blanket insulation in the roof and exterior walls. Include all banding and 2 rolls of repair tape. The thickness and R-value of the insulation shall be determined by the designer. The final design, by the Contractor, shall meet all current energy code requirements.

Insulation will not be required for the T-Hangar building.

101-3.4 i) INTERIOR WALLS

1. Walls for the interior of the storage area and vestibule shall be gypsum wall board meeting ASTM C 36 and installed meeting ASTM C 840 and GA-216. The walls in the storage area shall include fiberglass reinforced panels (FRP). Base molding in the storage and vestibule area shall be ceramic tile on all walls.
2. Walls for the interior of the bathrooms shall include ceramic tile wainscoting behind the toilet and the sink. Height of tile shall be 5' from the floor.
3. Partition walls shall be constructed of steel framing meeting ASTM C 645 and installed as per ASTM C 754 and ASTM C 840 where applicable.
4. All exposed surfaces shall be painted. Acceptable manufacturers include Benjamin Moore, Martin Seymour, Pratt and Lambert, Duron, Porter Paints and Sherwin Williams. The final color is to be selected by the Owner from a standard color chart provided by the Contractor. Primers, undercoat materials, fillers shall be from the same manufacturer as the finish coats.

The Owner shall approve all color selections prior to the Contractor placing any orders. Any interior wall painted with a color not approved by the Owner shall be primed and re-painted at the Contractor's expense.

101-3.4 j) INTERIOR DOORS (Bathroom and Storage Room)

1. Interior doors shall meet NWWDA I.S.1-A and shall be solid core doors, premium grade, 5-ply, particleboard core. Door face shall be rotary cut with door color selected by the Owner prior to ordering. The doors shall be installed to comply with industry recognized quality standards.
2. Door hardware at all interior doors shall be SHLAGE, S-Series, with JUPITER (lever). Finish to be brushed aluminum. Lever handle shall meet ADA requirements. Locks shall be "push button" type. All locks shall be keyed to the Owner's master key system. All locks and latches installed on required exit/egress doors shall comply with 2012 ICC International Building Code 1017.4 or VA.USBC 1017.4.1 ex. 6.

101-3.4 k) EXTERIOR DOORS (Storefront Door and Maintenance Storage)

1. Vestibule (Storefront Door)

Door for vestibule (see exhibit) shall be ADA compliant, aluminum storefront door Trifab II 451-T system by Kawneer or similar. Storefront door shall be medium style, full view similar to Kawneer 350 and shall have ¾" insulated glazing. Provide all gaskets, weather stripping, caulking, push/pull hardware, and closers with hold open capability. The finish shall be a Kynar 500 Fluropon Coating or similar. Color to be dark bronze. The final installation shall be weatherproof. Provide standard lock capable of being keyed to the airport's key system.

2. Maintenance Storage Room Door

A 36" x 80" wide steel door with locking doorknob (lever style) in the location shown in Exhibit 2.1. All locks shall be capable of being keyed to the airports key system. The door shall be a commercial, welded, steel frame door with ADA threshold and stainless-steel hinges. Provide all gaskets, weather stripping and caulking for a weatherproof installation.

101-3.5 BUILDING ANCHORAGE AND FOUNDATION

101-3.5 a) ANCHOR BOLTS

Anchor bolts shall resist 100% of the critical column reactions determined from the load combinations. The Manufacturer is responsible for design of anchor bolt diameter and projection above the concrete foundation.

101-3.5 b) FOUNDATION

The foundation design (including slab) is the responsibility of the Contractor and is included in this specification. The building foundation shall be designed and engineered to support the building reactions in addition to other loads imposed by the building use or occupancy. The design shall be based on actual job site conditions. Foundation design shall include provisions for bolt embedment, length, hook, bearing angles, kickout bars, tie rods, concrete joints and any other associated items embedded in the concrete.

The concrete floor in the 60' x 60' corporate hangar shall be a minimum of 6" thick with No. 6 - 6"x6" wire reinforcing. A 6-mil vapor barrier shall be placed between the slab and the ground. The concrete shall meet the requirements as stated in 101-2.10. The 60' x 60' corporate hangar floor is to be designed for a maximum aircraft load of 78,000lb.

The concrete floor in the 26-unit T-hangar shall be a minimum of 6" thick with No. 6 - 6"x6" wire reinforcing. A 6-mil vapor barrier shall be placed between the slab and the ground. The concrete shall meet the requirements as stated in 101-2.10. The 26-unit T-hangar floor is to be designed for a maximum aircraft load of 30,000lb.

The foundation designs shall be sealed by an Engineer licensed in the state of Virginia and submitted to the Owners Project Manager for review and approval prior to submittal to Loudoun County for permit. A copy of the geotechnical report is included in the project specifications and outlines specific site conditions affecting the design of the foundation.

Concrete used for the building foundation shall be as specified by the foundation Engineer and as outlined in the foundation design provided by the Contractor.

101-3.6 BUILDING SPECIFICATIONS

101-3.6 a) ADMINISTRATION

1. The provisions of the Building Officials & Code Administrators International, Inc. Code (Virginia Uniform Statewide Building Code, 2012 Edition) shall apply to all matters affecting or relating to the building and structures set forth in the project plans and specifications.
2. When there are practical difficulties involved in carrying out the structural or mechanical provisions of the Code, the code official shall have the right to vary or modify such provisions upon application of the Owner or the Owner's Project Manager, provided that the spirit and intent of the law is observed and that public health, safety and welfare is assured.
3. The provisions of the project plans are not intended to prevent the use of any material or method of construction not specifically detailed, provided that the alternative meets or exceeds the specifications and is approved by the Owner's Project Manager.
4. The Contractor shall complete the necessary application for building permits in such a form as the local official prescribes.
5. The Contractor shall give the appropriate notice of the start of work under the building permit to the local building official within the timeframe dictated by the building official.
6. All work shall be conducted, installed and completed in a workmanlike and acceptable manner so as to secure the results intended by the project plans.
7. Structures identified in the project plans shall not be used or occupied in whole or in part until the certificate of use and occupancy has been issued by the local official.
8. Upon request of the holder of the building permit, the local official may issue a temporary certificate of occupancy for the structures identified in the project plans, provided that such portion or portions will be occupied safely prior to full completion of the structure without endangering life or public welfare.

9. Unless otherwise stated the General Definitions (Article 2, Section 201.0) of the 2012 ICC INTERNATIONAL BUILDING CODE Code shall have the meanings stated.
10. The Contractor shall supply the Owner's Project Manager with stamped construction details showing anchor bolt settings, sidewall, endwall, firewall and roof framing, transverse cross section covering and flashing details, accessory installation details and all other necessary details required for a complete construction.
11. The Contractor shall provide the Owner's Project Manager with foundation reaction figures used in the foundation design.
12. The Contractor shall provide all construction surveys necessary to construct the site in accordance with the project plans.
13. All references to applicable specifications, codes, or manuals shall have the same effect as inclusion in their entirety with this document and shall be the most recent versions.
14. The Project Manual is intended for comparison of bids and conveys the Owner's intent for the type and use of the building. Installation details not covered shall be the responsibility of the Contractor.

Design loads shall be as stated herein and as clearly set forth in order document and shall be in accordance with IBC 2012 Building code standard design practices and ASCE 7-05.

15. The Contractor shall be responsible for bringing any discrepancies or anticipated difficulties related to compliance with this project manual to the attention of the Owner prior to submission of his/her bid.

101-3.6 b) BUILDING CLASSIFICATION

For the purposes of classification, the structures use are noted as follows:

T-Hangar

Use Group S-2, Low Hazard Storage (Note: This facility is intended for the storage of aircraft only)

3. The Contractor shall design and construct a 2-hour rated firewall in the locations noted in the exhibit. The firewall shall divide the T-hangar building from floor to ceiling and meet building code requirements for a fire barrier. All exposed surfaces shall be properly finished and painted. Acceptable manufacturers include Benjamin Moore, Martin Seymour, Pratt and Lambert, Duron, Porter Paints and Sherwin Williams. The final color is to be selected by the Owner from a standard color chart

provided by the Contractor. Primers, undercoat materials, fillers shall be from the same manufacturer as the finish coats.

Corporate Hangar

Use Group S-2, Low Hazard Storage (Note: This facility is intended for the storage of aircraft only)

101-3.6 c) CONSTRUCTION CLASSIFICATION

IBC Construction Type	II B
NFPA 409 Use Group (Table 4.1.3)	Group III (10,800 sq. ft.)
NFPA 409 Construction Type	Type II (000)

101-3.6 d) GENERAL BUILDING LIMITATIONS

The structure erected shall be limited to the noted height and area limitations:

Height = 3 story, 40'

Maximum Hangar Area = 12,000 sf.

101-3.6 e) MEANS OF EGRESS

1. Occupant load = 6 (Bathroom/Vestibule)
2. Minimum size of exit doors shall provide a clear width of not less than 36 inches.

101-3.6 f) FIRE PROTECTION

1. The distance to the nearest fire hydrant is 80 feet.
2. Two fire hydrants located within 100' of the structure. Maximum hydrant flow is 3,307 gpm @20psi. Field tested on March 23, 2018.

101-3.6 g) STRUCTURAL LOADS

1. Roof:
 - Live Load = 20 psf
 - Snow Load (Roof) = 25 psf
 - Wind Speed Design = 100 mph (min), Exposure: C, Imp. Factor = 1.00
2. Seismic Zone: B
3. Floor Slab Live Load = 250 psf
4. Concentrated Load = 3,000 lbs

5. Maximum allowable soil bearing pressure: 2,000 psf
6. Frost Line Depth = 12"

101-3.6 h) INTERIOR BUILDING COMPONENTS

T-Hangar Lighting/Electrical

1. Install three (3) interior overhead LED light fixtures in each T-hangar unit. Lights shall be 90W / 11,500 Lumen / 5000K color. Switches shall be located adjacent to the access door.
2. Install four (4) interior overhead LED light fixtures in the oversized T-hangar unit on the far south end of the building. Lights shall be 90W / 11,500 Lumen / 5000K color.
3. Install three (3) - 120V receptacles in each T-hangar unit.
4. Install five (5) - 120V receptacles in the oversized T-hangar unit on the far south end of the building.
5. Provide separate circuit breakers for the receptacles in each T-hangar unit. (The number of circuit breakers needed for the receptacles shall be determined by applicable code).
6. Provide separate circuit breaker for lights not associated with outlets in each of the units.
7. Provide separate circuit breakers for each hangar door.
8. Provide generator plug and disconnect switch for each door. The electrician, as part of the design, shall confirm with the owner the size and type of generator plug that will be required to ensure compatibility.
9. Penetrations through the firewalls shall be designed by the electrical engineer and shall meet local building codes.
10. Install one (1) interior overhead LED light fixture in each bathroom. Lights shall be 90W / 11,500 Lumen / 5000K color. Switches shall be located adjacent to the doors.

All interior wiring shall be installed per the requirements of the current version of the NEC code and all state and local codes including installation of conduits and fittings.

The 26-unit T-Hangar shall be powered from one meter. Separate meters for each unit will not be required. The Contractor shall determine the required size and layout of the electrical service for the T-hangar building. It is recommended that the Contractor run preliminary calculations prior to submitting a bid. The Contractor shall prepare the required load letter for submission to the local power company. The Owner will be responsible for coordination with the local power company.

Corporate Hangar Lighting/Electrical

11. Install high bay LED fixtures capable of providing a minimum 75-foot candle illumination in the hangar bay. Switches for fixtures shall be located adjacent to the access door.
12. Install six (6) - 120V receptacles in each hangar unit.
13. Provide separate circuit breakers for the receptacles in each hangar unit. (The number of circuit breakers needed for the receptacles shall be determined by applicable code).
14. Provide separate circuit breakers for the lights not associated with outlets in each of the units.
15. Provide separate circuit breakers for each hangar door.
16. Provide generator plug and disconnect switch for each door. The electrician, as part of the design, shall confirm with the owner the size and type of generator plug that will be required to ensure compatibility.
17. Provide power for new grinder pump. The contractor's electrical engineer shall provide the design of circuit to meet all electrical and building codes.

All interior wiring shall be installed per the requirements of the current version of the NEC code and all state and local codes including installation of conduits and fittings.

The 60' x 60' hangar shall be powered from one meter. The Contractor shall determine the required size and layout of the electrical service. It is recommended that the Contractor run preliminary calculations prior to submitting a bid. The Contractor shall prepare the required load letter for submission to the local power company. The Owner will be responsible for coordination with the local power company.

Vestibule/Storage/Maintenance Storage Lighting/Electrical

1. Install one (1) interior overhead LED light fixture in the storage area. Lights shall be 90W / 11,500 Lumen / 5000K color. Switches shall be located adjacent to the door.

2. Install two (2) interior overhead LED light fixtures in the vestibule and maintenance storage area. Lights shall be 90W / 11,500 Lumen / 5000K color. Switches shall be located adjacent to the doors.

101-3.6 i) EXTERIOR BUILDING COMPONENTS

1. The structure shall be fitted with gutters and down spouts. Final locations of down spouts shall be coordinated with the site plan. Building limitations, with regards to downspout locations, that require downspout adjustments shall be coordinated with the Owner's Project Manager during site construction to ensure the final downspout locations line up with the underground system as depicted in the site plan. Downspouts for the T-Hangar will outfall into the proposed storm sewer system constructed with this project (see site plan for locations and details).

The downspouts on the east side of the 60 x 60 corporate hangar facility will outfall above ground in a concrete swale. The downspouts on the west side will drain into an underground system that will outfall into the proposed storm sewer system constructed with this project.

2. Structure and trim colors to be approved by the Owner prior to ordering materials.
3. **Corporate Hangar** - Install four (4) LED flood lights. One fixture shall be mounted on the norther corner of the hangar facing the apron and the second on the southern corner of the building facing the apron. The third light shall be mounted on the south corner of Unit 1 and the fourth on the south corner of Unit 2. The lights shall be an LED type flood light, 40° optic, cut-off fixture with an LED count of 40 including all mounting hardware, housings, lenses, photo-cell control and other incidental required for a complete and fully operational lighting system. Acceptable equipment includes Cree Edge Series or equivalent.

Security lights shall be installed on the exterior walls of the hangar building in the locations as shown in the exhibit. Light fixtures shall be complete shielded, weatherproof, 120V, 100W LED floodlights (3000K) units including all mounting hardware, housings, lenses, photo-cell control, and other incidental required for a complete and fully operational lighting system.

Exterior lighting shall operate on a single photocell integrated into the electrical system.

All wall mounted exterior lighting shall be full cut-off or directionally shielded.

4. **Corporate Hangar Door** - The Contractor shall provide three (3) 60' x 18' electric bi-fold doors each consisting of an all steel bi-fold door frame, 120 or 240-volt single phase, 60 Hz, top mounted electric operator, pre-wired 3-station push button

controls (momentary up and down), top, center, side jamb and bottom rubber door seals, 4-cable pick-up, manual latching door locks with lock-out interlock switch and safety over-ride switch. The door operator shall be pre-wired at the factory. It shall be the Contractor's responsibility to provide the proper electrical materials for field installation. Provide a minimum 4" WMP-10 R-13 reinforced white-faced blanket insulation in the bi-fold door. Include all banding and 2 rolls of repair tape.

Include one (1) 16-gauge 3070 rough framed openings for access door (6" step-over) and electrical inter-locks for each door.

5. **T-Hangar** - Install twelve (12) LED flood lights. Six fixtures shall be mounted on the east side of the hangar facing the apron and the other six on the west side of the hangar facing the apron. The lights shall be an LED type flood light, 40° optic, full cut-off fixture with an LED count of 40 including all mounting hardware, housings, lenses, photo-cell control and other incidental required for a complete and fully operational lighting system. Acceptable equipment includes Cree Edge Series or equivalent.

Security lights shall be installed in the locations of the hangar building in the locations as shown in the exhibit. Light fixtures shall be complete shielded, weatherproof, 120V, 100W LED floodlights (3000K) units including all mounting hardware, housings, lenses, photo-cell control and other incidental required for a complete and fully operational lighting system.

Exterior lighting shall operate on a single photocell integrated into the electrical system.

All wall mounted exterior lighting shall be full cut-off or directionally shielded.

6. **T-Hangar Door** - 42' Wide by 14' Tall with 36" wide pedestrian door and locking doorknob. Include one, 16-gauge 3070 rough framed opening for access door (6" step-over) and electrical inter-locks. One (1) door shall be 48' wide by 14' tall with 36" pedestrian door and locking doorknob. Install on oversized hangar (See Detail D, Exhibit 2.2. of this specification).
7. Building width noted shall be as measured from center line to center line of end wall columns.
8. Building length noted shall be as measured from center line to center line of end wall columns.
9. Eave height shall be as measured from the top of the eave purlin or door truss to the bottom of column base plate.
10. Steel door leaves with hot-rolled vertical jambs (L/120) and bottom sill, galvanized horizontal girts at 4'0" centers, 9" heavy duty bottom rollers, telescoping steel top-guide rollers assemblies equipped with anti-friction bushings. Door shall accept 9"

of live load deflection down and 6' of wind load deflection up. All door components shall be pre-punched and ready for modular assembly.

11. Include mechanical pick-up brackets which mount to the trailing jamb of each door leaf.
12. Provide two-ply weather seals and pre-punched galvanized seal retainers around the perimeter of each door leaf.
13. Complete upper guide rail system including upper guide beams, structural supports at 10' on centers, complete galvanized soffit plate, close-off angles, intermediate brace angles and necessary clips. All members shall be pre-punched and intended to be assembled on the ground in 20 ft modules.
14. Factory assembled internal Dual 1.5 HP Drive units (explosion proof 18" above the floor), UL508A certified control panel(includes VFD, PLC, transformer, diagnostic scree) pendant (constant contact - open and close pushbuttons, pulsating light/buzzer, open and close limit switch, and festoon overhead power system.
15. Contractor shall provide P.E. sign/sealed drawings. The complete door system shall be designed for IBC 2012 building code 115MPH, exposure C, risk category II.

101-3.6 j) FIRE SUPPRESSION SYSTEM

Available fire flow for this site is +2,800 gpm @ 20psi. There are four fire hydrants located within 500' lay distance of the proposed buildings. As per Table B105.1 of the 2012 International Building Code, the required fire flow for the Corporate Hangar (10,800 sf) and T-Hangar (<12,000sf w/ firewalls), Type IIB building is 2,250gpm. A fire suppression system is not required for these hangars.

101-3.6 k) T-HANGAR BATHROOMS

Section Requirements

- A. Work shall conform to the current version of the Virginia Uniform Statewide Building Code and the National Electric Code.
- B. The electrical and plumbing information presented is for general information purposes only. The Contractor(s) shall be responsible for modifications required for the proper execution of the work. If the Building Inspection Department requires that the electrical and plumbing work be designed and sealed by an Engineer, then it shall be the Contractor's responsibility to coordinate, obtain, and submit the required information (Reference Section 101-1-2). Submit (1) copy of electrical and plumbing permit drawings, as required, to the Owner's

Project Manager for their records. The Contractor shall be required to obtain all electrical and plumbing permits.

- C. Install and/or construct all products and materials in accordance with the manufacturer's instructions and industry standards.
- D. All work and materials shall be installed and comply with ADA requirements.
- E. Insulate the pipes below all sinks or lavatories for protection. Handicap access shall be provided at all sinks and lavatories.
- F. Toilet fixtures must have a finish dimension of 1'-6" (18") from the center of the fixture (bowl) to the finish wall surface, as required by ADA. The flush valve or handle must be located on the open (accessible) side of the toilet.
- G. The Plumbing Contractor shall insulate any above ceiling water (supply) piping.
- H. Submit Product Data for each type of electrical item and plumbing fixture.
- I. Comply with requirements of Public Law 102-486, "Energy Policy Act", regarding water flow rate and water consumption of plumbing fixtures.
- J. Contractor shall coordinate with the local power company and the Owner for meter base acquisition and installation, Contractor shall pay any fees associated with meter base.
- K. All interior and exterior wiring shall be installed per the requirements of the current version of the NEC code and all state and local codes including installation of conduits and fittings.
- L. See hangar layout for receptacle locations.

Equipment

- A. Provide the following fixtures/appurtenances:
 - 1. Tank Type, Vitreous-China Elongated Water Closet; Equal to "Hymont" series by Crane or approved equivalent. All water closets are to meet ADA guidelines. Acceptable Manufacturers include but are not limited to American Standard, Kohler & Bradley. Toilet seat equal to Bemis 1955C and automatic flush valve equal to Sloan 8111.

The toilet paper dispenser shall be equal to “Bobrick” B-2888 and the grab bar equal to “Bobrick” B-5806 Series.

2. Wall Hung, Vitreous-China Lavatories: Equal to Comrade Wall Hung Lavatory 0124.024 by American Standard with lever type faucet by “Sloan” Model SF-2300. Acceptable manufacturers include but are not limited to American Standard, Kohler & Bradley.
3. The bathroom sink mirror shall have a stainless-steel frame and be equal to “Bobrick” 165-1830.
4. Tank less water heater equal to Bosch Tronic 3000 or approved equivalent. Contractor to incorporate condensate drain location and outfall to meet all local codes. Trip hazards determined by the Owner will not be allowed.
5. Toilet Accessories to be by “Bobrick”, Bradley A&J Washroom Accessories, Inc. or equal.
6. Freeze-proof hose bib on Northwest side of the building Woodford Commercial Model B65 or approved equivalent. A shutoff valve shall be installed on the line and located inside of the either the storage or maintenance room. The valve shall be easily accessible.
7. Light Fixture/Exhaust fan shall be equal to “Broan” Model 680.
8. The light switch shall be motion activated and be equal to “Leviton” Decora PR150.
9. Space Heater shall be equal to “Q-Mark” Model CRA1512T2.
10. Fiberglass panels shall be equal to Crane Composites, Varietex “Morning Mist”.
11. All bathrooms shall have a floor drain installed and tied to the sanitary sewer system.
12. Men’s and women’s restroom signage shall be acrylic and be ADA-compliant Braille. Installation shall meet manufacturer’s requirements.

- B. Reinforcement: Provide blocking at wall locations for associated hangers or brackets.
- C. The Contractor may submit alternatives of similar quality for approval by the Owner's Project Manager. The Owner's Project Manager shall be the sole judge of the acceptability of alternatives.

Installation

- A. Install fixtures with flanges and gasket seals.
- B. Install water-supply stop valves for all fixtures (sinks, toilets, etc.) in accessible locations.
- C. Install escutcheons at wall, floor, and ceiling penetrations in exposed, finished locations and within cabinets and millwork. Use deep-pattern escutcheons where required to conceal protruding pipe fittings.
- D. Seal joints between fixtures and walls, floors, and counters using sanitary-type, one-part, mildew-resistant, silicone sealant. Match sealant color to fixture color.
- E. Install wires and cables according to the NEC's "Standard of Installation."
- F. The Electrical Contractor shall include all backboard material, blocking and electrical outlets necessary for system(s) operation.
- G. Hold all sheathing material (FRP, Gypsum Board) 1/2" above the finished floor.
- H. Coordinate color of the bathroom floor tile with the Owner prior to ordering materials.
- I. The water service cut-off valve shall be located to the right of the bathroom sink.
- J. All water pipe shall be copper with rigid foam insulation and routed in the wall cavity.

101-3.6 I) STORAGE ROOM

Section Requirements

- A. Work shall conform to the current version of the Virginia Uniform Statewide Building Code and the National Electric Code.
- B. The electrical and plumbing information presented is for general information purposes only. The Contractor(s) shall be responsible for modifications required for the proper execution of the work. If the Building Inspection Department requires that the electrical and plumbing work be designed and sealed by an Engineer, then it shall be the Contractor's responsibility to coordinate, obtain, and submit the required information (Reference Section 101-1-2). Submit (1) copy of electrical and plumbing permit drawings, as required, to the Owner's Project Manager for their records. The Contractor shall be required to obtain all electrical and plumbing permits.
- C. Install and/or construct all products and materials in accordance with the manufacturer's instructions and industry standards.
- D. All work and materials shall comply with ADA requirements.
- E. The Plumbing Contractor shall insulate any above ceiling water (supply) piping or exposed piping susceptible to freezing.
- F. Provide rough-in for future utility sink/mop sink (see Exhibit 2.1). Rough in shall include, at minimum, shut off valve and capped floor drain for future sink installation.
- G. Space Heater shall be equal to "Q-Mark" Model CRA1512T2.
- H. Submit Product Data for each type of electrical item and plumbing fixture.
- H. Comply with requirements of Public Law 102-486, "Energy Policy Act", regarding water flow rate and water consumption of plumbing fixtures.
- I. All interior and exterior wiring shall be installed per the requirements of the current version of the NEC code and all state and local codes including installation of conduits and fittings.
- J. See hangar layout for receptacle and sink locations.

101-3.6 (m) VESTIBULE

Equipment

Provide the following fixtures/appurtenances:

1. Thru wall, shutter exhaust fan with thermostat.
 2. The light switch shall be motion activated and be equal to “Leviton” Decora PR150.
 3. Space Heater shall be equal to “Q-Mark” Model CRA1512T2.
- A. Reinforcement: Provide blocking at wall locations for associated hangers or brackets.
- B. The Contractor may submit alternatives of similar quality for approval by the Owner’s Project Manager. The Owner’s Project Manager shall be the sole judge of the acceptability of alternatives.

101-3.6 (n) HANGAR BAY INFRARED HEATING (Bid Additive)

The Contractor shall provide gas fired infrared heating for the corporate hangar bays only. This shall include connection to fuel service (Washington Gas), safety valves, connections, fixtures, and power. Units shall be installed to maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer. Do not install products under environmental conditions outside manufacturer's recommended limits.

Submittals shall be provided for the selected units and shall include, at a minimum, the manufacturer's data sheets on each product to be used, including:

1. Rated capacities and operating characteristics.
2. Installation methods.
3. Shop Drawings: Submit complete shop drawings indicating system components, control diagrams and load calculations.
4. Field quality-control test reports.
5. Installation, Operation and Maintenance Data: Provide copy of Installation, Operation & Maintenance document.
6. Warranty: Provide copy of manufacturer’s warranty statement.

Heaters shall be installed meeting all local building codes, or in their absence, the latest edition of the associated national regulations including NEC, ANSI and NFPA.

The Contractor shall engage a factory-authorized service representative to inspect, test and adjust components, assemblies, and equipment installations, including connections, and to assist in testing and to train Owner's maintenance personnel to adjust, operate, and maintain gas-fired radiant heaters.

METHOD OF MEASUREMENT

101-4.1 26-UNIT T-HANGAR

Building construction/fabrication and delivery, foundation design, foundation construction including excavation, building erection, plumbing and electrical work will be measured on a lump sum basis supplied, installed, and accepted building structures including supplying all materials, erection, blocking, installation of all electrical items, plumbing general construction, gutters, doors, signage, plan approvals and all other incidental items and those as stated in these specifications. The Contractor shall provide a schedule of values to the Owner's Project Manager prior to the start of work.

The bidder is expected to carefully examine this performance specification in conjunction with the plans and technical specifications. He shall satisfy himself as to the character, quality, and quantities of work to be performed, materials to be furnished, and as to the requirements of this performance specification. The intent of this performance specification is to provide for construction and completion, in every detail, of the work described within this specification.

101-4.2 CORPORATE HANGAR (3 – 60' X 60')

Building construction/fabrication and delivery, foundation design, foundation construction including excavation, building erection, plumbing and electrical work will be measured on a lump sum basis supplied, installed, and accepted building structures including supplying all materials, erection, blocking, installation of all electrical items, general construction, gutters, doors, plan approvals and all other incidental items and those as stated in these specifications. The Contractor shall provide a schedule of values to the Owner's Project Manager prior to the start of work.

The bidder is expected to carefully examine this performance specification in conjunction with the plans and technical specifications. He shall satisfy himself as to the character, quality, and quantities of work to be performed, materials to be furnished, and as to the requirements of this performance specification. The intent of this performance specification is to provide for construction and completion, in every detail, of the work described within this specification.

101-4.3 CORPORATE HANGAR BAY INFRARED HEATING (BID ADDITIVE)

Hangar bay infrared heating shall be measured lump sum installed as a complete and fully functioning system, tested, and accepted as satisfactory by the Owner's Project Manager. The measurement for this item shall include layout, design system installation coordination and connection to individually metered service provided by Washington Gas.

101-4.4 CORPORATE HANGAR EPOXY COATED FLOOR (BID ADDITIVE)

Corporate hangar epoxy coated floor shall be measured per lump sum installed as a complete and finished floor system. The system shall include all materials, floor preparation, tool and incidental necessary to install a floor system accepted as satisfactory by the Owner's Project Manager.

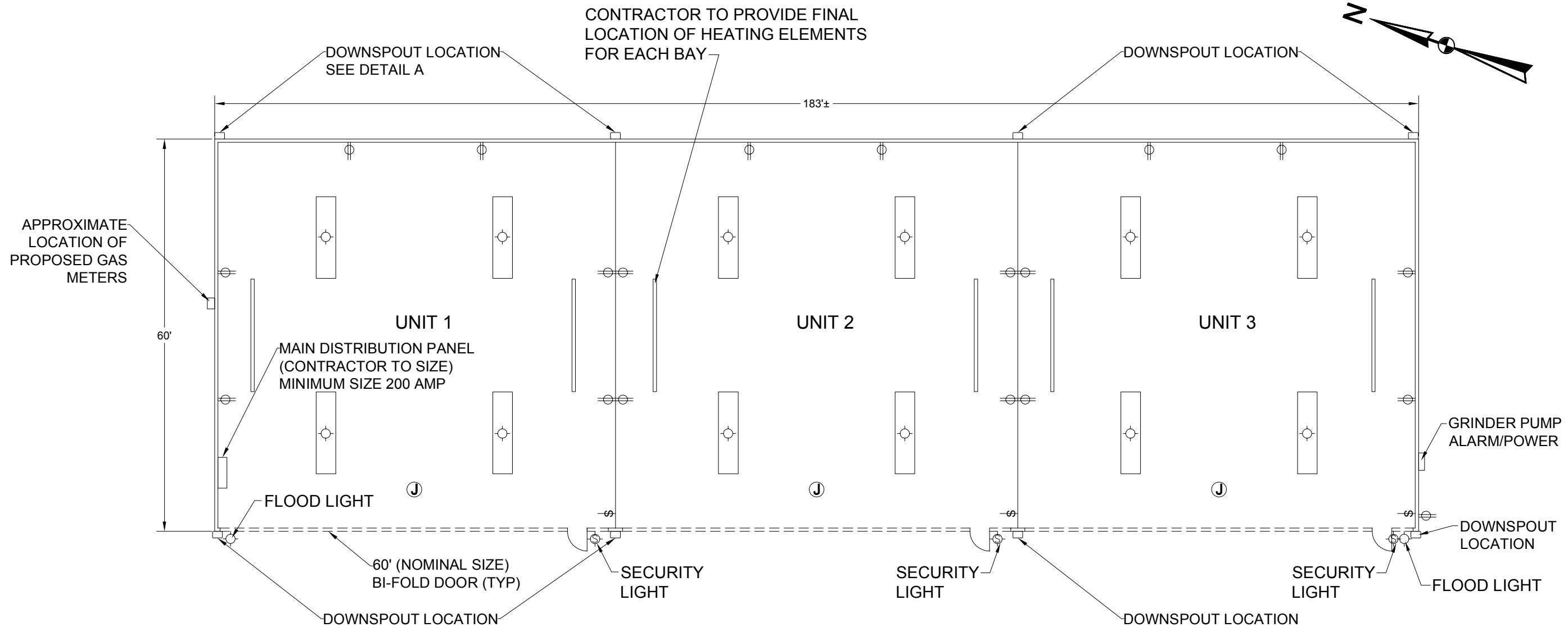
BASIS OF PAYMENT

Payment will be made at the contract unit price for a complete building and associated items, as stated in this specification, installed, and adjusted in place by the Contractor and accepted by the Owner's Project Manager. The following prices shall be full compensation for furnishing all materials and for all preparation, assembly, and installation of these materials, and for all labor, equipment, tools, and incidentals, necessary to complete these items. Bid additives will be evaluated independently from the base bid as a determination of low bidder. Bid additives will be considered based on the availability of local funding.

Payment will be made under:

- Item B-101-4.1 26-Unit T-Hangar --per lump sum
- Item B-101-4.2 Corporate Hangar -- per lump sum
- Item B-101-4.3 Corporate Hangar Bay Infrared Heating -- per lump sum
- Item B-104-4.4 Corporate Hangar Epoxy Coated Floor System -- per lump sum

END OF ITEM B-101



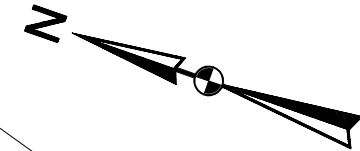
APPROXIMATE
LOCATION OF
PROPOSED GAS
METERS

DOWNSPOUT LOCATION
SEE DETAIL A

CONTRACTOR TO PROVIDE FINAL
LOCATION OF HEATING ELEMENTS
FOR EACH BAY

DOWNSPOUT LOCATION

183'±



60'

UNIT 1

UNIT 2

UNIT 3

MAIN DISTRIBUTION PANEL
(CONTRACTOR TO SIZE)
MINIMUM SIZE 200 AMP

FLOOD LIGHT

GRINDER PUMP
ALARM/POWER

60' (NOMINAL SIZE)
BI-FOLD DOOR (TYP)

SECURITY
LIGHT

SECURITY
LIGHT

SECURITY
LIGHT

DOWNSPOUT
LOCATION

FLOOD LIGHT

DOWNSPOUT LOCATION

DOWNSPOUT LOCATION

DOWNSPOUT
LOCATION

EXTERIOR WALL

LEGEND

⊙ EXTERIOR LIGHT FIXTURE

⊞ INTERIOR LIGHT FIXTURE

Ⓢ SWITCH

Ⓝ DOOR OPERATOR JUNCTION BOX

Ⓢ DUPLEX OUTLET

□ DOWNSPOUT

Ⓢ SECURITY LIGHT

— INFRARED HEATER (ALTERNATE)

**NOTE: SEE APPROVED SITE
PLAN FOR DOWNSPOUT
OUTFALL LOCATIONS.**

OVERHEAD DOOR

INTERIOR WALL

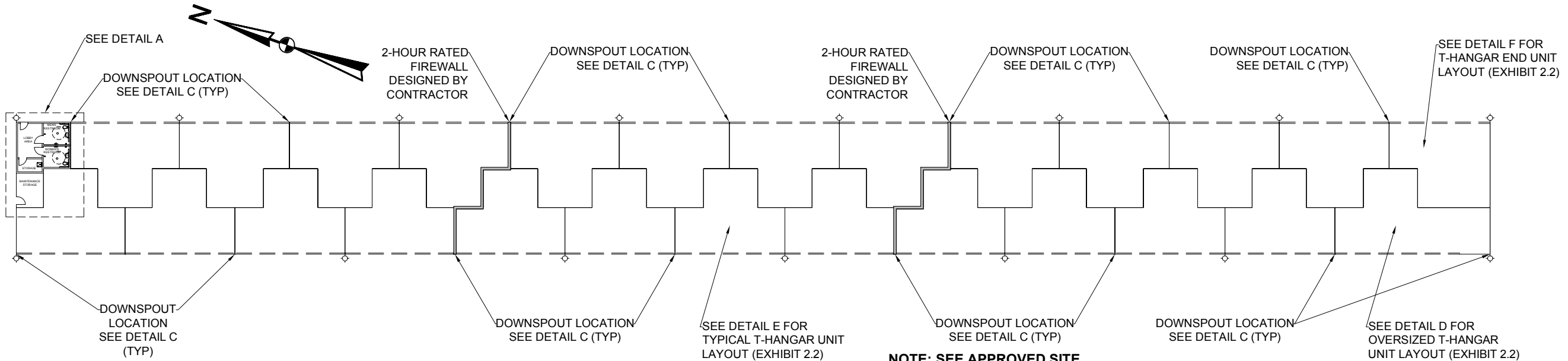
DETAIL A

TYPICAL DOWNSPOUT LOCATION

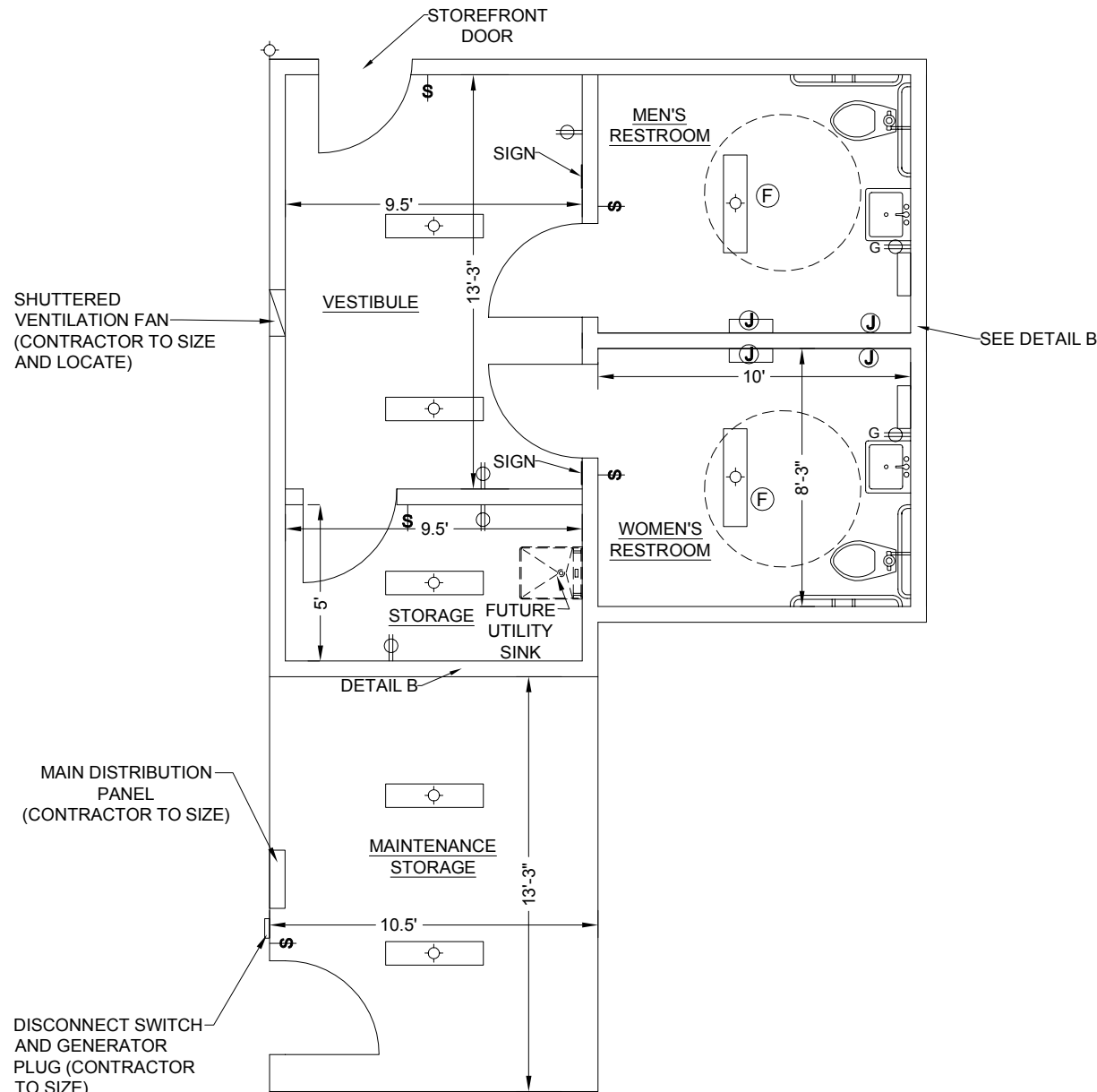
3108-1903

EXHIBIT 1
Leesburg Executive Airport
(3) 60' x 60' Hangar Building Floor Plan Layout

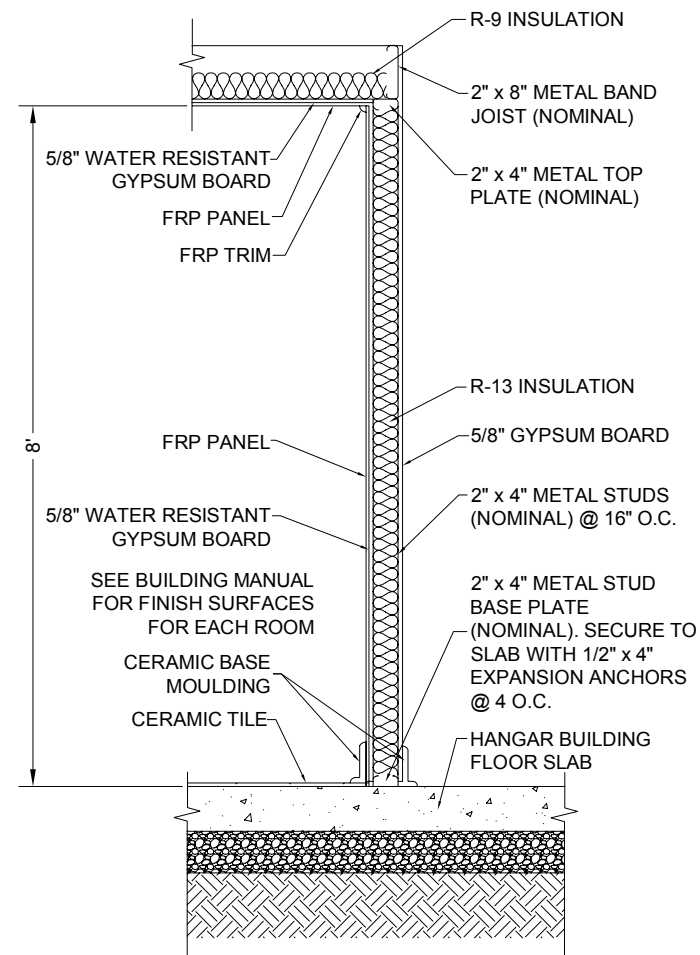
TALBERT & BRIGHT
ENGINEERING & PLANNING CONSULTANTS
10105 KRAUSE ROAD, SUITE 100
CHESTERFIELD, VIRGINIA 23832
PHONE: 804-768-6878 FAX: 804-768-6871



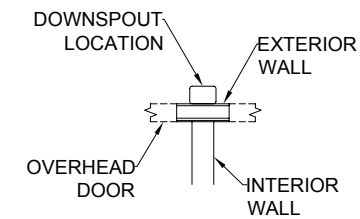
NOTE: SEE APPROVED SITE PLAN FOR DOWNSPOUT OUTFALL LOCATIONS.



**DETAIL A
BATHROOM AND STORAGE**



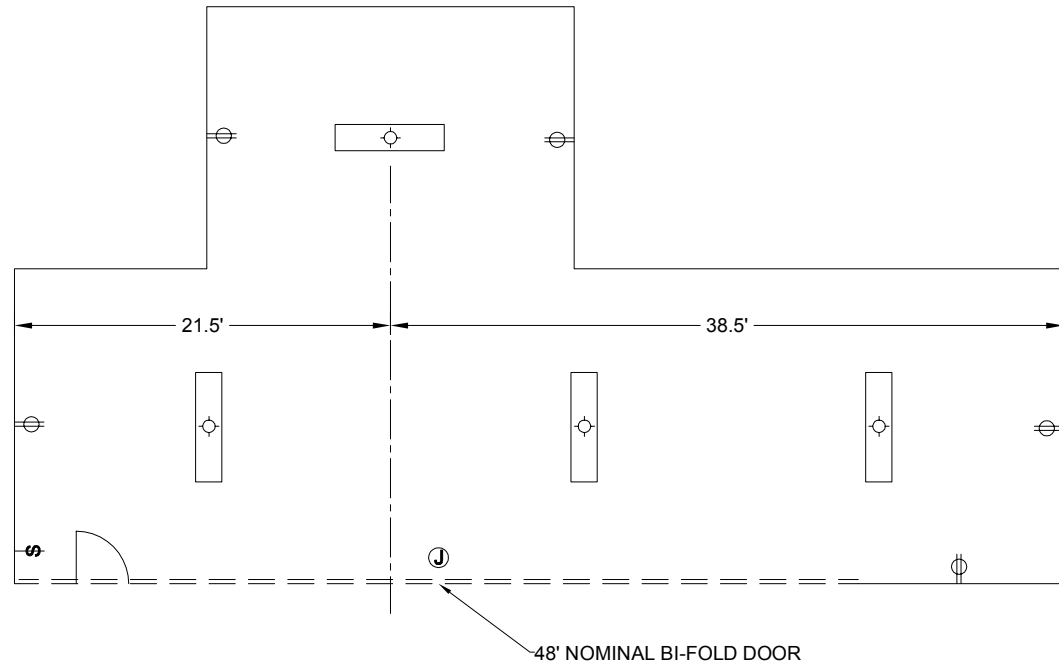
**DETAIL B
TYPICAL INTERIOR WALL SECTION
(LOBBY AREA)**



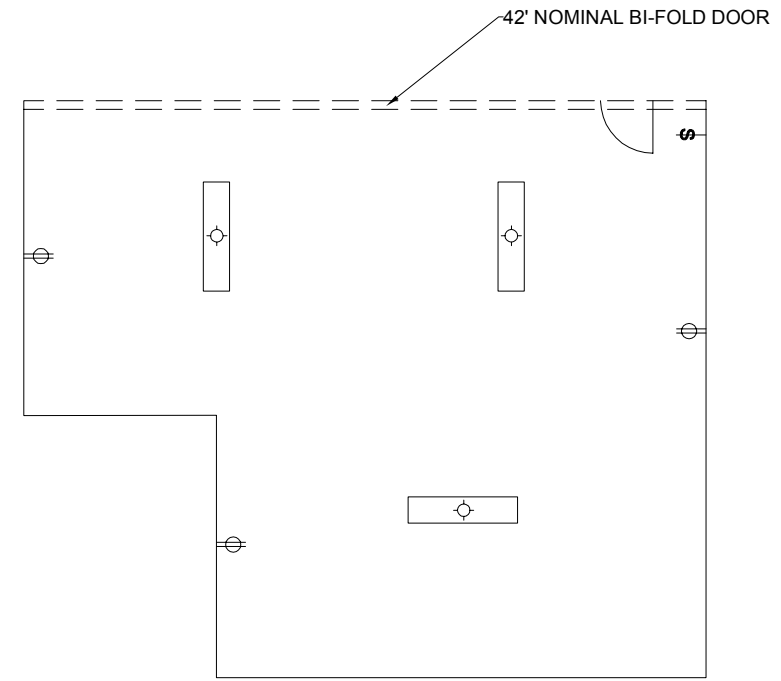
**DETAIL C
TYPICAL DOWNSPOUT LOCATION**

LEGEND

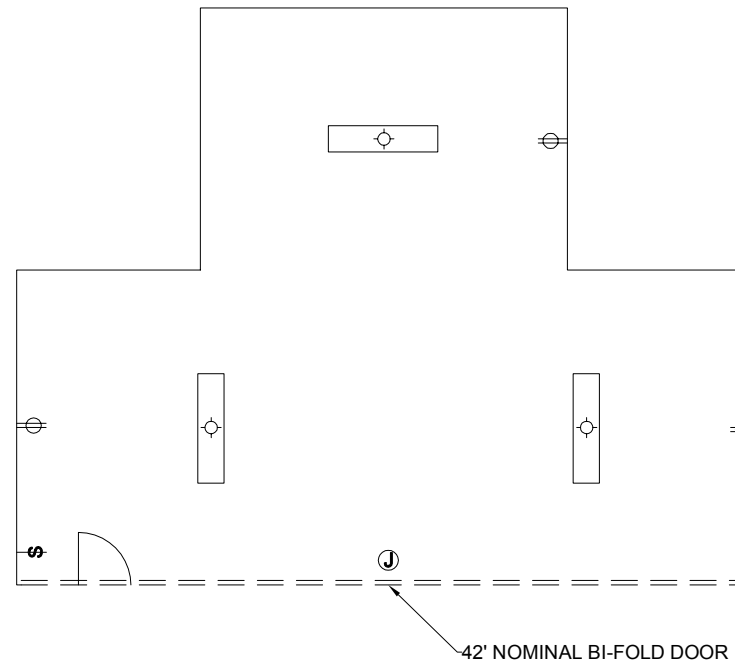
- ⊙ EXTERIOR LIGHT FIXTURE
- ⊚ INTERIOR LIGHT FIXTURE
- ⌘ SWITCH
- Ⓜ JUNCTION BOX
- Ⓢ DUPLEX OUTLET
- Ⓣ LIGHT FIXTURE/EXHAUST FAN



DETAIL D
OVERSIZED T-HANGAR UNIT LAYOUT



DETAIL F
T-HANGAR END UNIT LAYOUT



DETAIL E
TYPICAL T-HANGAR UNIT LAYOUT

- LEGEND**
- ⊗ EXTERIOR LIGHT FIXTURE
 - ⊠ INTERIOR LIGHT FIXTURE
 - ⚡ SWITCH
 - Ⓧ JUNCTION BOX
 - ⊕ DUPLEX OUTLET
 - Ⓢ LIGHT FIXTURE/EXHAUST FAN

ITEM C-100 CONTRACTOR QUALITY CONTROL PROGRAM

DESCRIPTION

100-1 General. Quality is more than test results. Quality is the combination of proper materials, testing, workmanship, equipment, inspection, and documentation of the project. Establishing and maintaining a culture of quality is key to achieving a quality project. The Contractor shall establish, provide, and maintain an effective Contractor Quality Control Program (CQCP) that details the methods and procedures that will be taken to assure that all materials and completed construction required by this contract conform to contract plans, technical specifications and other requirements, whether manufactured by the Contractor, or procured from subcontractors or vendors. Although guidelines are established and certain minimum requirements are specified here and elsewhere in the contract technical specifications, the Contractor shall assume full responsibility for accomplishing the stated purpose.

The Contractor shall establish a CQCP that will:

- a. Provide qualified personnel to develop and implement the CQCP.
- b. Provide for the production of acceptable quality materials.
- c. Provide sufficient information to assure that the specification requirements can be met.
- d. Document the CQCP process.

The Contractor shall not begin any construction or production of materials to be incorporated into the completed work until the CQCP has been reviewed and approved by the Resident Project Representative (RPR). No partial payment will be made for materials subject to specific quality control (QC) requirements until the CQCP has been reviewed and approved.

The QC requirements contained in this section and elsewhere in the contract technical specifications are in addition to and separate from the quality assurance (QA) testing requirements. QA testing requirements are the responsibility of the RPR or Contractor as specified in the specifications.

A Quality Control (QC)/Quality Assurance (QA) workshop with the Engineer, Resident Project Representative (RPR), Contractor, subcontractors, testing laboratories, and Owner's representative must be held prior to start of construction. The QC/QA workshop will be facilitated by the Contractor. The Contractor shall coordinate with the Airport and the RPR on time and location of the QC/QA workshop. Items to be addressed, at a minimum, will include:

- a. Review of the CQCP including submittals, QC Testing, Action & Suspension Limits for Production, Corrective Action Plans, Distribution of QC reports, and Control Charts.
- b. Discussion of the QA program.
- c. Discussion of the QC and QA Organization and authority including coordination and information exchange between QC and QA.
- d. Establish regular meetings to discuss control of materials, methods and testing.
- e. Establishment of the overall QC culture.

100-2 Description of program.

a. General description. The Contractor shall establish a CQCP to perform QC inspection and testing of all items of work required by the technical specifications, including those performed by subcontractors. The CQCP shall ensure conformance to applicable specifications and plans with

respect to materials, off-site fabrication, workmanship, construction, finish, and functional performance. The CQCP shall be effective for control of all construction work performed under this Contract and shall specifically include surveillance and tests required by the technical specifications, in addition to other requirements of this section and any other activities deemed necessary by the Contractor to establish an effective level of QC.

b. Contractor Quality Control Program (CQCP). The Contractor shall describe the CQCP in a written document that shall be reviewed and approved by the RPR prior to the start of any production, construction, or off-site fabrication. The written CQCP shall be submitted to the RPR for review and approval at least 10 calendar days before the CQCP Workshop. The Contractor's CQCP and QC testing laboratory must be approved in writing by the RPR prior to the Notice to Proceed (NTP).

The CQCP shall be organized to address, as a minimum, the following:

1. QC organization and resumes of key staff
2. Project progress schedule
3. Submittals schedule
4. Inspection requirements
5. QC testing plan
6. Documentation of QC activities and distribution of QC reports
7. Requirements for corrective action when QC and/or QA acceptance criteria are not met
8. Material quality and construction means and methods. Address all elements applicable to the project that affect the quality of the pavement structure including subgrade, subbase, base, and surface course. Some elements that must be addressed include, but is not limited to mix design, aggregate grading, stockpile management, mixing and transporting, placing and finishing, quality control testing and inspection, smoothness, laydown plan, equipment, and temperature management plan.

The Contractor must add any additional elements to the CQCP that is necessary to adequately control all production and/or construction processes required by this contract.

100-3 CQCP organization. The CQCP shall be implemented by the establishment of a QC organization. An organizational chart shall be developed to show all QC personnel, their authority, and how these personnel integrate with other management/production and construction functions and personnel.

The organizational chart shall identify all QC staff by name and function, and shall indicate the total staff required to implement all elements of the CQCP, including inspection and testing for each item of work. If necessary, different technicians can be used for specific inspection and testing functions for different items of work. If an outside organization or independent testing laboratory is used for implementation of all or part of the CQCP, the personnel assigned shall be subject to the qualification requirements of paragraphs 100-03a and 100-03b. The organizational chart shall indicate which personnel are Contractor employees and which are provided by an outside organization.

The QC organization shall, as a minimum, consist of the following personnel:

a. Program Administrator. The Contractor Quality Control Program Administrator (CQCPA) must be a full-time employee of the Contractor, or a consultant engaged by the Contractor. The

CQCPA must have a minimum of five (5) years of experience in QC pavement construction with prior QC experience on a project of comparable size and scope as the contract.

Included in the five (5) years of paving/QC experience, the CQCPA must meet at least one of the following requirements:

- (1) Professional Engineer with one (1) year of airport paving experience.
- (2) Engineer-in-training with two (2) years of airport paving experience.
- (3) National Institute for Certification in Engineering Technologies (NICET) Civil Engineering Technology Level IV with three (3) years of airport paving experience.
- (4) An individual with four (4) years of airport paving experience, with a Bachelor of Science Degree in Civil Engineering, Civil Engineering Technology or Construction.

The CQCPA must have full authority to institute any and all actions necessary for the successful implementation of the CQCP to ensure compliance with the contract plans and technical specifications. The CQCPA authority must include the ability to immediately stop production until materials and/or processes are in compliance with contract specifications. The CQCPA must report directly to a principal officer of the construction firm. The CQCPA may supervise the Quality Control Program on more than one project provided that person can be at the job site within two (2) hours after being notified of a problem.

b. QC technicians. A sufficient number of QC technicians necessary to adequately implement the CQCP must be provided. These personnel must be either Engineers, engineering technicians, or experienced craftsman with qualifications in the appropriate field equivalent to NICET Level II in Civil Engineering Technology or higher, and shall have a minimum of two (2) years of experience in their area of expertise.

The QC technicians must report directly to the CQCPA and shall perform the following functions:

- (1) Inspection of all materials, construction, plant, and equipment for conformance to the technical specifications, and as required by paragraph 100-6.
- (2) Performance of all QC tests as required by the technical specifications and paragraph 100-8.
- (3) Performance of tests for the RPR when required by the technical specifications.

Certification at an equivalent level of qualification and experience by a state or nationally recognized organization will be acceptable in lieu of NICET certification.

c. Staffing levels. The Contractor shall provide sufficient qualified QC personnel to monitor each work activity at all times. Where material is being produced in a plant for incorporation into the work, separate plant and field technicians shall be provided at each plant and field placement location. The scheduling and coordinating of all inspection and testing must match the type and pace of work activity. The CQCP shall state where different technicians will be required for different work elements.

100-4 Project progress schedule. Critical QC activities must be shown on the project schedule as required by the General Conditions.

100-5 Submittals schedule. The Contractor shall submit a detailed listing of all submittals (for example, mix designs, material certifications) and shop drawings required by the technical specifications. The listing can be developed in a spreadsheet format and shall include as a minimum:

- a. Specification item number

- b. Item description
- c. Description of submittal
- d. Specification paragraph requiring submittal
- e. Scheduled date of submittal

100-6 Inspection requirements. QC inspection functions shall be organized to provide inspections for all definable features of work, as detailed below. All inspections shall be documented by the Contractor as specified by paragraph 100-9.

Inspections shall be performed as needed to ensure continuing compliance with contract requirements until completion of the particular feature of work. Inspections shall include the following minimum requirements:

a. During plant operation for material production, QC test results and periodic inspections shall be used to ensure the quality of aggregates and other mix components, and to adjust and control mix proportioning to meet the approved mix design and other requirements of the technical specifications. All equipment used in proportioning and mixing shall be inspected to ensure its proper operating condition. The CQCP shall detail how these and other QC functions will be accomplished and used.

b. During field operations, QC test results and periodic inspections shall be used to ensure the quality of all materials and workmanship. All equipment used in placing, finishing, and compacting shall be inspected to ensure its proper operating condition and to ensure that all such operations are in conformance to the technical specifications and are within the plan dimensions, lines, grades, and tolerances specified. The CQCP shall document how these and other QC functions will be accomplished and used.

100-7 Contractor QC testing facility.

a. For projects that include Item P-401, Item P-403, and Item P-404, the Contractor shall ensure facilities, including all necessary equipment, materials, and current reference standards, are provided that meet requirements in the following paragraphs of ASTM D3666, *Standard Specification for Minimum Requirements for Agencies Testing and Inspecting Road and Paving Materials*:

- 8.1.3 Equipment Calibration and Checks;
- 8.1.9 Equipment Calibration, Standardization, and Check Records;
- 8.1.12 Test Methods and Procedures

b. For projects that include P-501, the Contractor shall ensure facilities, including all necessary equipment, materials, and current reference standards, are provided that meet requirements in the following paragraphs of ASTM C1077, *Standard Practice for Agencies Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Testing Agency Evaluation*:

- 7 Test Methods and Procedures
- 8 Facilities, Equipment, and Supplemental Procedures

100-8 QC testing plan. As a part of the overall CQCP, the Contractor shall implement a QC testing plan, as required by the technical specifications. The testing plan shall include the minimum tests and test frequencies required by each technical specification Item, as well as any additional QC tests that the Contractor deems necessary to adequately control production and/or construction processes.

The QC testing plan can be developed in a spreadsheet fashion and shall, as a minimum, include the following:

- a. Specification item number (e.g., P-401)
- b. Item description (e.g., Hot Mix Asphalt Pavements)
- c. Test type (e.g., gradation, grade, asphalt content)
- d. Test standard (e.g., ASTM or American Association of State Highway and Transportation Officials (AASHTO) test number, as applicable)
- e. Test frequency (e.g., as required by technical specifications or minimum frequency when requirements are not stated)
- f. Responsibility (e.g., plant technician)
- g. Control requirements (e.g., target, permissible deviations)

The QC testing plan shall contain a statistically-based procedure of random sampling for acquiring test samples in accordance with ASTM D3665. The RPR shall be provided the opportunity to witness QC sampling and testing.

All QC test results shall be documented by the Contractor as required by paragraph 100-9.

100-9 Documentation. The Contractor shall maintain current QC records of all inspections and tests performed. These records shall include factual evidence that the required QC inspections or tests have been performed, including type and number of inspections or tests involved; results of inspections or tests; nature of defects, deviations, causes for rejection, etc.; proposed remedial action; and corrective actions taken.

These records must cover both conforming and defective or deficient features, and must include a statement that all supplies and materials incorporated in the work are in full compliance with the terms of the contract. Legible copies of these records shall be furnished to the RPR daily. The records shall cover all work placed subsequent to the previously furnished records and shall be verified and signed by the CQCPA.

Contractor QC records required for the contract shall include, but are not necessarily limited to, the following records:

a. Daily inspection reports. Each Contractor QC technician shall maintain a daily log of all inspections performed for both Contractor and subcontractor operations. These technician's daily reports shall provide factual evidence that continuous QC inspections have been performed and shall, as a minimum, include the following:

- (1) Technical specification item number and description
- (2) Compliance with approved submittals
- (3) Proper storage of materials and equipment
- (4) Proper operation of all equipment
- (5) Adherence to plans and technical specifications
- (6) Summary of any necessary corrective actions
- (7) Safety inspection.
- (8) Photographs and/or video

The daily inspection reports shall identify all QC inspections and QC tests conducted, results of inspections, location and nature of defects found, causes for rejection, and remedial or corrective actions taken or proposed.

The daily inspection reports shall be signed by the responsible QC technician and the CQCPA. The RPR shall be provided at least one copy of each daily inspection report on the work day following the day of record. When QC inspection and test results are recorded and transmitted electronically, the results must be archived.

b. Daily test reports. The Contractor shall be responsible for establishing a system that will record all QC test results. Daily test reports shall document the following information:

- (1) Technical specification item number and description
- (2) Test designation
- (3) Location
- (4) Date of test
- (5) Control requirements
- (6) Test results
- (7) Causes for rejection
- (8) Recommended remedial actions
- (9) Retests

Test results from each day's work period shall be submitted to the RPR prior to the start of the next day's work period. When required by the technical specifications, the Contractor shall maintain statistical QC charts. When QC daily test results are recorded and transmitted electronically, the results must be archived.

100-10 Corrective action requirements. The CQCP shall indicate the appropriate action to be taken when a process is deemed, or believed, to be out of control (out of tolerance) and detail what action will be taken to bring the process into control. The requirements for corrective action shall include both general requirements for operation of the CQCP as a whole, and for individual items of work contained in the technical specifications.

The CQCP shall detail how the results of QC inspections and tests will be used for determining the need for corrective action and shall contain clear rules to gauge when a process is out of control and the type of correction to be taken to regain process control.

When applicable or required by the technical specifications, the Contractor shall establish and use statistical QC charts for individual QC tests. The requirements for corrective action shall be linked to the control charts.

100-11 Inspection and/or observations by the RPR. All items of material and equipment are subject to inspection and/or observation by the RPR at the point of production, manufacture or shipment to determine if the Contractor, producer, manufacturer or shipper maintains an adequate QC system in conformance with the requirements detailed here and the applicable technical specifications and plans. In addition, all items of materials, equipment and work in place shall be subject to inspection and/or observation by the RPR at the site for the same purpose.

Inspection and/or observations by the RPR does not relieve the Contractor of performing QC inspections of either on-site or off-site Contractor's or subcontractor's work.

100-12 Noncompliance.

a. The Resident Project Representative (RPR) will provide written notice to the Contractor of any noncompliance with their CQCP. After receipt of such notice, the Contractor must take corrective action.

b. When QC activities do not comply with either the CQCP or the contract provisions or when the Contractor fails to properly operate and maintain an effective CQCP, and no effective corrective

actions have been taken after notification of non-compliance, the RPR will recommend the Owner take the following actions:

- (1) Order the Contractor to replace ineffective or unqualified QC personnel or subcontractors and/or
- (2) Order the Contractor to stop operations until appropriate corrective actions are taken.

METHOD OF MEASUREMENT

100-13 Basis of measurement and payment. Contractor Quality Control Program (CQCP) is for the personnel, tests, facilities and documentation required to implement the CQCP. The CQCP will be paid as a lump sum with the following schedule of partial payments:

- a. With first pay request, 25% with approval of CQCP and completion of the Quality Control (QC)/Quality Assurance (QA) workshop.
- b. When 25% or more of the original contract is earned, an additional 25%.
- c. When 50% or more of the original contract is earned, an additional 20%.
- d. When 75% or more of the original contract is earned, an additional 20%
- e. After final inspection and acceptance of project, the final 10%.

BASIS OF PAYMENT

100-14 Payment will be made under:

Item C-100 Contractor Quality Control Program (CQCP)

REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

National Institute for Certification in Engineering Technologies (NICET)

ASTM International (ASTM)

ASTM C1077	Standard Practice for Agencies Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Testing Agency Evaluation
ASTM D3665	Standard Practice for Random Sampling of Construction Materials
ASTM D3666	Standard Specification for Minimum Requirements for Agencies Testing and Inspecting Road and Paving Materials

END OF ITEM C-100

C-102

Temporary Air and Water Pollution, Soil Erosion, and Siltation Control

DESCRIPTION

102-1. This item shall consist of temporary control measures as shown on the plans or as ordered by the Resident Project Representative (RPR) during the life of a contract to control pollution of air and water, soil erosion, and siltation through the use of silt fences, berms, dikes, dams, sediment basins, fiber mats, gravel, mulches, grasses, slope drains, and other erosion control devices or methods.

Temporary erosion control shall be in accordance with the approved erosion control plan; the approved Construction Safety and Phasing Plan (CSPP) and AC 150/5370-2, *Operational Safety on Airports During Construction* and the grading permit issued by Loudoun County. The temporary erosion control measures contained herein shall be coordinated with the permanent erosion control measures specified as part of this contract to the extent practical to assure economical, effective, and continuous erosion control throughout the construction period.

Temporary control may include work outside the construction limits such as borrow pit operations, equipment and material storage sites, waste areas, and temporary plant sites.

Temporary control measures shall be designed, installed and maintained to minimize the creation of wildlife attractants that have the potential to attract hazardous wildlife on or near public-use airports.

MATERIALS

102-2.1 Grass. Grass that will not compete with the grasses sown later for permanent cover per Item T-901 shall be a quick-growing species (such as ryegrass, Italian ryegrass, or cereal grasses) suitable to the area providing a temporary cover. Selected grass species shall not create a wildlife attractant.

102-2.2 Mulches. Mulches may be hay, straw, fiber mats, netting, bark, wood chips, or other suitable material reasonably clean and free of noxious weeds and deleterious materials per Item T-908. Mulches shall not create a wildlife attractant.

102-2.3 Fertilizer. Fertilizer shall be a standard commercial grade and shall conform to all federal and state regulations and to the standards of the Association of Official Agricultural Chemists.

102-2.4 Slope drains. Slope drains may be constructed of pipe, fiber mats, rubble, concrete, asphalt, or other materials that will adequately control erosion.

102-2.5 Silt fence. Silt fence shall consist of polymeric filaments which are formed into a stable network such that filaments retain their relative positions. Synthetic filter fabric shall contain ultraviolet ray inhibitors and stabilizers to provide a minimum of six months of expected usable construction life. Silt fence shall meet the requirements of ASTM D6461.

156-2.6 Sediment Traps. The sediment traps shall be formed via excavation required to attain the necessary storage volume as noted in the project plans. Outlet material shall be a combination of course aggregate and riprap to provide filtering and detention as well as stability. Course aggregate shall be VDOT #3, #357, or #5. Riprap shall be Class I. The traps shall meet the requirements noted in the current edition of the Loudoun County Code Ordinance 1220.01, FSM Section 7.600 Figure 4.

156-2.7 Inlet Protection. Culvert and drop inlet protection materials shall meet the requirements of the project plans and the current version of the Virginia Erosion and Sediment Control Handbook (VESCH).

156-2.8 Sediment basins. The sediment basins shall be formed via excavation required to attain the necessary storage volume as noted in the project plans. Outlet materials include the dewatering device, stand pipe (riser), base, rip rap, stone, and barrel. The basin shall meet all requirements of the Erosion and Sediment Control Handbook (VESCH) Spec 3.14.

102-2.8 Other. All other materials shall meet commercial grade standards and shall be approved by the RPR before being incorporated into the project.

CONSTRUCTION REQUIREMENTS

102-3.1 General. In the event of conflict between these requirements and pollution control laws, rules, or regulations of other federal, state, or local agencies, the more restrictive laws, rules, or regulations shall apply.

The RPR shall be responsible for assuring compliance to the extent that construction practices, construction operations, and construction work are involved.

102-3.2 Schedule. Prior to the start of construction, the Contractor shall submit schedules in accordance with the approved Construction Safety and Phasing Plan (CSPP) and the plans for accomplishment of temporary and permanent erosion control work for clearing and grubbing; grading; construction; paving; and structures at watercourses. The Contractor shall also submit a proposed method of erosion and dust control on haul roads and borrow pits and a plan for disposal of waste materials. Work shall not be started until the erosion control schedules and methods of operation for the applicable construction have been accepted by the RPR.

102-3.3 Construction details. The Contractor will be required to incorporate all permanent erosion control features into the project at the earliest practicable time as outlined in the plans and approved CSPP. Except where future construction operations will damage slopes, the Contractor shall perform the permanent seeding and mulching and other specified slope protection work in stages, as soon as substantial areas of exposed slopes can be made available. Temporary erosion and pollution control measures will be used to correct conditions that develop during construction that were not foreseen during the design stage; that are needed prior to installation of permanent control features; or that are needed temporarily to control erosion that develops during normal construction practices, but are not associated with permanent control features on the project.

Where erosion may be a problem, schedule and perform clearing and grubbing operations so that grading operations and permanent erosion control features can follow immediately if project conditions permit. Temporary erosion control measures are required if permanent measures cannot immediately follow grading operations. The RPR shall limit the area of clearing and grubbing, excavation, borrow, and embankment operations in progress, commensurate with the Contractor's capability and progress in keeping the finish grading, mulching, seeding, and other such permanent control measures current with the accepted schedule. If seasonal limitations make such coordination unrealistic, temporary erosion control measures shall be taken immediately to the extent feasible and justified as directed by the RPR.

The Contractor shall provide immediate permanent or temporary pollution control measures to minimize contamination of adjacent streams or other watercourses, lakes, ponds, or other areas of water impoundment as directed by the RPR. If temporary erosion and pollution control measures are required due to the Contractor's negligence, carelessness, or failure to install permanent controls

as a part of the work as scheduled or directed by the RPR, the work shall be performed by the Contractor and the cost shall be incidental to this item.

The RPR may increase or decrease the area of erodible earth material that can be exposed at any time based on an analysis of project conditions.

The erosion control features installed by the Contractor shall be maintained by the Contractor during the construction period.

Provide temporary structures whenever construction equipment must cross watercourses at frequent intervals. Pollutants such as fuels, lubricants, bitumen, raw sewage, wash water from concrete mixing operations, and other harmful materials shall not be discharged into any waterways, impoundments or into natural or manmade channels.

102-3.4 Installation, maintenance and removal of silt fence. Silt fences shall extend a minimum of 16 inches (41 cm) and a maximum of 34 inches (86 cm) above the ground surface. Posts shall be set no more than 10 feet (3 m) on center. Filter fabric shall be cut from a continuous roll to the length required minimizing joints where possible. When joints are necessary, the fabric shall be spliced at a support post with a minimum 12-inch (300-mm) overlap and securely sealed. A trench shall be excavated approximately 4 inches (100 mm) deep by 4 inches (100 mm) wide on the upslope side of the silt fence. The trench shall be backfilled and the soil compacted over the silt fence fabric. The Contractor shall remove and dispose of silt that accumulates during construction and prior to establishment of permanent erosion control. The fence shall be maintained in good working condition until permanent erosion control is established. Silt fence shall be removed upon approval of the RPR.

METHOD OF MEASUREMENT

102-4.1 Temporary erosion and pollution control work required will be performed as scheduled or directed by the RPR. Completed and accepted work will be measured as follows:

- a. Temporary construction entrance will be measured per each including stone, fabric and maintenance for the duration of the project.
- b. Temporary silt fence will be measured by the linear foot including fabric, stakes and maintenance for the duration of the project.
- c. Temporary diversion dikes will be measured by the linear foot.
- d. Temporary rock check dams will be measured per each.
- e. Temporary inlet protection will be measured per each.
- f. Temporary culvert inlet protection will be measured per each.
- g. Temporary sediment traps and sediment basins will be measured by the cubic yard to include all aggregates, filter cloth, excavation, etc. for a fully functional facility and maintenance for the duration of the project.
- h. Temporary seeding and mulching per acre

102-4.2 Control work performed for protection of construction areas outside the construction limits, such as borrow and waste areas, haul roads, equipment and material storage sites, and temporary plant sites, will not be measured and paid for directly but shall be considered as a subsidiary obligation of the Contractor.

BASIS OF PAYMENT

102-5.1 Accepted quantities of temporary water pollution, soil erosion, and siltation control work ordered by the RPR and measured as provided in paragraph 102-4.1 will be paid for under:

Item C-102-5.1a	Temporary construction entrance - per each
Item C-102-5.1b	Installation and Removal of temporary silt fence - per linear foot
Item C-102-5.1c	Temporary diversion dikes - per linear foot
Item C-102-5.1d	Temporary rock check dam - per each
Item C-102-5.1e	Temporary inlet protection-per each
Item C-102-5.1f	Culvert Inlet Protection – per each
Item C-102-5.1g	Temporary Sediment Trap-per cubic yard
Item C-102-5.1h	Temporary Sediment Basin-per cubic yard
Item C-102-5.1i	Temporary Seeding and Mulching – per acre

Where other directed work falls within the specifications for a work item that has a contract price, the units of work shall be measured and paid for at the contract unit price bid for the various items.

Temporary control features not covered by contract items that are ordered by the RPR will be paid for in accordance with the General Conditions.

REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

Advisory Circulars (AC)

AC 150/5200-33 *Hazardous Wildlife Attractants on or Near Airports*

AC 150/5370-2 *Operational Safety on Airports During Construction*

ASTM International (ASTM)

ASTM D6461 *Standard Specification for Silt Fence Materials*

United States Department of Agriculture (USDA)

FAA/USDA Wildlife Hazard Management at Airports, A Manual for Airport Personnel

END OF ITEM C-102

Section C-105

Mobilization

105-1 Description. This item of work shall consist of, but is not limited to, work and operations necessary for the movement of personnel, equipment, material and supplies to and from the project site for work on the project except as provided in the contract as separate pay items.

105-2 Mobilization limit. Mobilization shall be limited to 10 percent of the total project cost.

105-3 Posted notices. Prior to commencement of construction activities, the Contractor must post the following documents in a prominent and accessible place where they may be easily viewed by all employees of the prime Contractor and by all employees of subcontractors engaged by the prime Contractor: Equal Employment Opportunity (EEO) Poster “Equal Employment Opportunity is the Law” in accordance with the Office of Federal Contract Compliance Programs Executive Order 11246, as amended; Davis Bacon Wage Poster (WH 1321) - DOL “Notice to All Employees” Poster; and Applicable Davis-Bacon Wage Rate Determination. These notices must remain posted until final acceptance of the work by the Owner.

105-4 Engineer/RPR field office. The Contractor shall provide dedicated space for the use of the field RPR and inspectors, as a field office for the duration of the project. This space shall be located conveniently near the construction and shall be separate from any space used by the Contractor. The Contractor shall furnish water, sanitary facilities, heat, air conditioning, and electricity in accordance with local building codes.

METHOD OF MEASUREMENT

105-5 Basis of measurement and payment. Based upon the contract lump sum price for “Mobilization” partial payments will be allowed as follows:

- a. With first pay request, 25%.
- b. When 25% or more of the original contract is earned, an additional 25%.
- c. When 50% or more of the original contract is earned, an additional 40%.
- d. After Final Inspection, staging area clean-up and delivery of all Project Closeout materials as required by the General Conditions, the final 10%.

BASIS OF PAYMENT

105-6 Payment will be made under:

Item C-105 Mobilization

REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

Office of Federal Contract Compliance Programs (OFCCP)

Executive Order 11246, as amended

EEOC-P/E-1 – Equal Employment Opportunity is the Law Poster
United States Department of Labor, Wage and Hour Division (WHD)
WH 1321 – Employee Rights under the Davis-Bacon Act Poster

END OF ITEM C-105

Section C-110

Method of Estimating Percentage of Material Within Specification Limits (PWL)

110-1 General. When the specifications provide for acceptance of material based on the method of estimating percentage of material within specification limits (PWL), the PWL will be determined in accordance with this section. All test results for a lot will be analyzed statistically to determine the total estimated percent of the lot that is within specification limits. The PWL is computed using the sample average (\bar{X}) and sample standard deviation (S_n) of the specified number (n) of sublots for the lot and the specification tolerance limits, L for lower and U for upper, for the particular acceptance parameter. From these values, the respective Quality index, Q_L for Lower Quality Index and/or Q_U for Upper Quality Index, is computed and the PWL for the lot for the specified n is determined from Table 1. All specification limits specified in the technical sections shall be absolute values. Test results used in the calculations shall be to the significant figure given in the test procedure.

There is some degree of uncertainty (risk) in the measurement for acceptance because only a small fraction of production material (the population) is sampled and tested. This uncertainty exists because all portions of the production material have the same probability to be randomly sampled. The Contractor's risk is the probability that material produced at the acceptable quality level is rejected or subjected to a pay adjustment. The Owner's risk is the probability that material produced at the rejectable quality level is accepted.

It is the intent of this section to inform the Contractor that, in order to consistently offset the Contractor's risk for material evaluated, production quality (using population average and population standard deviation) must be maintained at the acceptable quality specified or higher. In all cases, it is the responsibility of the Contractor to produce at quality levels that will meet the specified acceptance criteria when sampled and tested at the frequencies specified.

110-2 Method for computing PWL. The computational sequence for computing PWL is as follows:

- a. Divide the lot into n sublots in accordance with the acceptance requirements of the specification.
- b. Locate the random sampling position within the subplot in accordance with the requirements of the specification.
- c. Make a measurement at each location, or take a test portion and make the measurement on the test portion in accordance with the testing requirements of the specification.
- d. Find the sample average (\bar{X}) for all subplot test values within the lot by using the following formula:

$$\bar{X} = (x_1 + x_2 + x_3 + \dots + x_n) / n$$

Where: \bar{X} = Sample average of all subplot test values within a lot

x_1, x_2, \dots, x_n = Individual subplot test values

n = Number of subplot test values

- e. Find the sample standard deviation (S_n) by use of the following formula:

Section C-110-1

$$S_n = [(d_1^2 + d_2^2 + d_3^2 + \dots + d_n^2)/(n-1)]^{1/2}$$

Where: S_n = Sample standard deviation of the number of subplot test values in the set

d_1, d_2, \dots, d_n = Deviations of the individual subplot test values x_1, x_2, \dots from the average value X

that is: $d_1 = (x_1 - X), d_2 = (x_2 - X) \dots d_n = (x_n - X)$

n = Number of subplot test values

f. For single sided specification limits (i.e., L only), compute the Lower Quality Index Q_L by use of the following formula:

$$Q_L = (X - L) / S_n$$

Where: L = specification lower tolerance limit

Estimate the percentage of material within limits (PWL) by entering Table 1 with Q_L , using the column appropriate to the total number (n) of measurements. If the value of Q_L falls between values shown on the table, use the next higher value of PWL.

g. For double-sided specification limits (i.e., L and U), compute the Quality Indexes Q_L and Q_U by use of the following formulas:

$$Q_L = (X - L) / S_n$$

and

$$Q_U = (U - X) / S_n$$

Where: L and U = specification lower and upper tolerance limits

Estimate the percentage of material between the lower (L) and upper (U) tolerance limits (PWL) by entering Table 1 separately with Q_L and Q_U , using the column appropriate to the total number (n) of measurements, and determining the percent of material above P_L and percent of material below P_U for each tolerance limit. If the values of Q_L fall between values shown on the table, use the next higher value of P_L or P_U . Determine the PWL by use of the following formula:

$$PWL = (P_U + P_L) - 100$$

Where: P_L = percent within lower specification limit

P_U = percent within upper specification limit

EXAMPLE OF PWL CALCULATION

Project: Example Project

Test Item: Item P-401, Lot A.

A. PWL Determination for Mat Density.

1. Density of four random cores taken from Lot A.

A-1 = 96.60

A-2 = 97.55

A-3 = 99.30

$$A-4 = 98.35$$

$$n = 4$$

2. Calculate average density for the lot.

$$X = (x_1 + x_2 + x_3 + \dots + x_n) / n$$

$$X = (96.60 + 97.55 + 99.30 + 98.35) / 4$$

$$X = 97.95\% \text{ density}$$

3. Calculate the standard deviation for the lot.

$$S_n = [((96.60 - 97.95)^2 + (97.55 - 97.95)^2 + (99.30 - 97.95)^2 + (98.35 - 97.95)^2) / (4 - 1)]^{1/2}$$

$$S_n = [(1.82 + 0.16 + 1.82 + 0.16) / 3]^{1/2}$$

$$S_n = 1.15$$

4. Calculate the Lower Quality Index Q_L for the lot. ($L=96.3$)

$$Q_L = (X - L) / S_n$$

$$Q_L = (97.95 - 96.30) / 1.15$$

$$Q_L = 1.4348$$

5. Determine PWL by entering Table 1 with $Q_L = 1.44$ and $n = 4$.

$$PWL = 98$$

B. PWL Determination for Air Voids.

1. Air Voids of four random samples taken from Lot A.

$$A-1 = 5.00$$

$$A-2 = 3.74$$

$$A-3 = 2.30$$

$$A-4 = 3.25$$

2. Calculate the average air voids for the lot.

$$X = (x_1 + x_2 + x_3 + \dots + x_n) / n$$

$$X = (5.00 + 3.74 + 2.30 + 3.25) / 4$$

$$X = 3.57\%$$

3. Calculate the standard deviation S_n for the lot.

$$S_n = [((3.57 - 5.00)^2 + (3.57 - 3.74)^2 + (3.57 - 2.30)^2 + (3.57 - 3.25)^2) / (4 - 1)]^{1/2}$$

$$S_n = [(2.04 + 0.03 + 1.62 + 0.10) / 3]^{1/2}$$

$$S_n = 1.12$$

4. Calculate the Lower Quality Index Q_L for the lot. ($L = 2.0$)

$$Q_L = (X - L) / S_n$$

$$Q_L = (3.57 - 2.00) / 1.12$$

$$Q_L = 1.3992$$

5. Determine P_L by entering Table 1 with $Q_L = 1.41$ and $n = 4$.

$$P_L = 97$$

6. Calculate the Upper Quality Index Q_U for the lot. ($U = 5.0$)

Section C-110-3

$$Q_U = (U - X) / S_n$$

$$Q_U = (5.00 - 3.57) / 1.12$$

$$Q_U = 1.2702$$

7. Determine P_U by entering Table 1 with $Q_U = 1.29$ and $n = 4$.

$$P_U = 93$$

8. Calculate Air Voids PWL

$$PWL = (P_L + P_U) - 100$$

$$PWL = (97 + 93) - 100 = 90$$

EXAMPLE OF OUTLIER CALCULATION (REFERENCE ASTM E178)

Project: Example Project

Test Item: Item P-401, Lot A.

A. Outlier Determination for Mat Density.

1. Density of four random cores taken from Lot A arranged in descending order.

$$A-3 = 99.30$$

$$A-4 = 98.35$$

$$A-2 = 97.55$$

$$A-1 = 96.60$$

2. From ASTM E178, Table 1, for $n=4$ an upper 5% significance level, the critical value for test criterion = 1.463.

3. Use average density, standard deviation, and test criterion value to evaluate density measurements.

a. For measurements greater than the average:

If (measurement - average)/(standard deviation) is less than test criterion, then the measurement is not considered an outlier.

For A-3, check if $(99.30 - 97.95) / 1.15$ is greater than 1.463.

Since 1.174 is less than 1.463, the value is not an outlier.

b. For measurements less than the average:

If (average - measurement)/(standard deviation) is less than test criterion, then the measurement is not considered an outlier.

For A-1, check if $(97.95 - 96.60) / 1.15$ is greater than 1.463.

Since 1.174 is less than 1.463, the value is not an outlier.

Note: In this example, a measurement would be considered an outlier if the density were:

$$\text{Greater than } (97.95 + 1.463 \times 1.15) = 99.63\%$$

OR

$$\text{less than } (97.95 - 1.463 \times 1.15) = 96.27\%.$$

Table 1. Table for Estimating Percent of Lot Within Limits (PWL)

Percent Within Limits (P _L and P _U)	Positive Values of Q (Q _L and Q _U)							
	n=3	n=4	n=5	n=6	n=7	n=8	n=9	n=10
99	1.1541	1.4700	1.6714	1.8008	1.8888	1.9520	1.9994	2.0362
98	1.1524	1.4400	1.6016	1.6982	1.7612	1.8053	1.8379	1.8630
97	1.1496	1.4100	1.5427	1.6181	1.6661	1.6993	1.7235	1.7420
96	1.1456	1.3800	1.4897	1.5497	1.5871	1.6127	1.6313	1.6454
95	1.1405	1.3500	1.4407	1.4887	1.5181	1.5381	1.5525	1.5635
94	1.1342	1.3200	1.3946	1.4329	1.4561	1.4717	1.4829	1.4914
93	1.1269	1.2900	1.3508	1.3810	1.3991	1.4112	1.4199	1.4265
92	1.1184	1.2600	1.3088	1.3323	1.3461	1.3554	1.3620	1.3670
91	1.1089	1.2300	1.2683	1.2860	1.2964	1.3032	1.3081	1.3118
90	1.0982	1.2000	1.2290	1.2419	1.2492	1.2541	1.2576	1.2602
89	1.0864	1.1700	1.1909	1.1995	1.2043	1.2075	1.2098	1.2115
88	1.0736	1.1400	1.1537	1.1587	1.1613	1.1630	1.1643	1.1653
87	1.0597	1.1100	1.1173	1.1192	1.1199	1.1204	1.1208	1.1212
86	1.0448	1.0800	1.0817	1.0808	1.0800	1.0794	1.0791	1.0789
85	1.0288	1.0500	1.0467	1.0435	1.0413	1.0399	1.0389	1.0382
84	1.0119	1.0200	1.0124	1.0071	1.0037	1.0015	1.0000	0.9990
83	0.9939	0.9900	0.9785	0.9715	0.9671	0.9643	0.9624	0.9610
82	0.9749	0.9600	0.9452	0.9367	0.9315	0.9281	0.9258	0.9241
81	0.9550	0.9300	0.9123	0.9025	0.8966	0.8928	0.8901	0.8882
80	0.9342	0.9000	0.8799	0.8690	0.8625	0.8583	0.8554	0.8533
79	0.9124	0.8700	0.8478	0.8360	0.8291	0.8245	0.8214	0.8192
78	0.8897	0.8400	0.8160	0.8036	0.7962	0.7915	0.7882	0.7858
77	0.8662	0.8100	0.7846	0.7716	0.7640	0.7590	0.7556	0.7531
76	0.8417	0.7800	0.7535	0.7401	0.7322	0.7271	0.7236	0.7211
75	0.8165	0.7500	0.7226	0.7089	0.7009	0.6958	0.6922	0.6896
74	0.7904	0.7200	0.6921	0.6781	0.6701	0.6649	0.6613	0.6587
73	0.7636	0.6900	0.6617	0.6477	0.6396	0.6344	0.6308	0.6282
72	0.7360	0.6600	0.6316	0.6176	0.6095	0.6044	0.6008	0.5982
71	0.7077	0.6300	0.6016	0.5878	0.5798	0.5747	0.5712	0.5686
70	0.6787	0.6000	0.5719	0.5582	0.5504	0.5454	0.5419	0.5394
69	0.6490	0.5700	0.5423	0.5290	0.5213	0.5164	0.5130	0.5105
68	0.6187	0.5400	0.5129	0.4999	0.4924	0.4877	0.4844	0.4820
67	0.5878	0.5100	0.4836	0.4710	0.4638	0.4592	0.4560	0.4537
66	0.5563	0.4800	0.4545	0.4424	0.4355	0.4310	0.4280	0.4257
65	0.5242	0.4500	0.4255	0.4139	0.4073	0.4030	0.4001	0.3980
64	0.4916	0.4200	0.3967	0.3856	0.3793	0.3753	0.3725	0.3705
63	0.4586	0.3900	0.3679	0.3575	0.3515	0.3477	0.3451	0.3432
62	0.4251	0.3600	0.3392	0.3295	0.3239	0.3203	0.3179	0.3161
61	0.3911	0.3300	0.3107	0.3016	0.2964	0.2931	0.2908	0.2892
60	0.3568	0.3000	0.2822	0.2738	0.2691	0.2660	0.2639	0.2624
59	0.3222	0.2700	0.2537	0.2461	0.2418	0.2391	0.2372	0.2358
58	0.2872	0.2400	0.2254	0.2186	0.2147	0.2122	0.2105	0.2093
57	0.2519	0.2100	0.1971	0.1911	0.1877	0.1855	0.1840	0.1829
56	0.2164	0.1800	0.1688	0.1636	0.1607	0.1588	0.1575	0.1566
55	0.1806	0.1500	0.1406	0.1363	0.1338	0.1322	0.1312	0.1304
54	0.1447	0.1200	0.1125	0.1090	0.1070	0.1057	0.1049	0.1042
53	0.1087	0.0900	0.0843	0.0817	0.0802	0.0793	0.0786	0.0781
52	0.0725	0.0600	0.0562	0.0544	0.0534	0.0528	0.0524	0.0521
51	0.0363	0.0300	0.0281	0.0272	0.0267	0.0264	0.0262	0.0260
50	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Section C-110-5

Percent Within Limits (P _L and P _U)	Negative Values of Q (Q _L and Q _U)							
	n=3	n=4	n=5	n=6	n=7	n=8	n=9	n=10
49	-0.0363	-0.0300	-0.0281	-0.0272	-0.0267	-0.0264	-0.0262	-0.0260
48	-0.0725	-0.0600	-0.0562	-0.0544	-0.0534	-0.0528	-0.0524	-0.0521
47	-0.1087	-0.0900	-0.0843	-0.0817	-0.0802	-0.0793	-0.0786	-0.0781
46	-0.1447	-0.1200	-0.1125	-0.1090	-0.1070	-0.1057	-0.1049	-0.1042
45	-0.1806	-0.1500	-0.1406	-0.1363	-0.1338	-0.1322	-0.1312	-0.1304
44	-0.2164	-0.1800	-0.1688	-0.1636	-0.1607	-0.1588	-0.1575	-0.1566
43	-0.2519	-0.2100	-0.1971	-0.1911	-0.1877	-0.1855	-0.1840	-0.1829
42	-0.2872	-0.2400	-0.2254	-0.2186	-0.2147	-0.2122	-0.2105	-0.2093
41	-0.3222	-0.2700	-0.2537	-0.2461	-0.2418	-0.2391	-0.2372	-0.2358
40	-0.3568	-0.3000	-0.2822	-0.2738	-0.2691	-0.2660	-0.2639	-0.2624
39	-0.3911	-0.3300	-0.3107	-0.3016	-0.2964	-0.2931	-0.2908	-0.2892
38	-0.4251	-0.3600	-0.3392	-0.3295	-0.3239	-0.3203	-0.3179	-0.3161
37	-0.4586	-0.3900	-0.3679	-0.3575	-0.3515	-0.3477	-0.3451	-0.3432
36	-0.4916	-0.4200	-0.3967	-0.3856	-0.3793	-0.3753	-0.3725	-0.3705
35	-0.5242	-0.4500	-0.4255	-0.4139	-0.4073	-0.4030	-0.4001	-0.3980
34	-0.5563	-0.4800	-0.4545	-0.4424	-0.4355	-0.4310	-0.4280	-0.4257
33	-0.5878	-0.5100	-0.4836	-0.4710	-0.4638	-0.4592	-0.4560	-0.4537
32	-0.6187	-0.5400	-0.5129	-0.4999	-0.4924	-0.4877	-0.4844	-0.4820
31	-0.6490	-0.5700	-0.5423	-0.5290	-0.5213	-0.5164	-0.5130	-0.5105
30	-0.6787	-0.6000	-0.5719	-0.5582	-0.5504	-0.5454	-0.5419	-0.5394
29	-0.7077	-0.6300	-0.6016	-0.5878	-0.5798	-0.5747	-0.5712	-0.5686
28	-0.7360	-0.6600	-0.6316	-0.6176	-0.6095	-0.6044	-0.6008	-0.5982
27	-0.7636	-0.6900	-0.6617	-0.6477	-0.6396	-0.6344	-0.6308	-0.6282
26	-0.7904	-0.7200	-0.6921	-0.6781	-0.6701	-0.6649	-0.6613	-0.6587
25	-0.8165	-0.7500	-0.7226	-0.7089	-0.7009	-0.6958	-0.6922	-0.6896
24	-0.8417	-0.7800	-0.7535	-0.7401	-0.7322	-0.7271	-0.7236	-0.7211
23	-0.8662	-0.8100	-0.7846	-0.7716	-0.7640	-0.7590	-0.7556	-0.7531
22	-0.8897	-0.8400	-0.8160	-0.8036	-0.7962	-0.7915	-0.7882	-0.7858
21	-0.9124	-0.8700	-0.8478	-0.8360	-0.8291	-0.8245	-0.8214	-0.8192
20	-0.9342	-0.9000	-0.8799	-0.8690	-0.8625	-0.8583	-0.8554	-0.8533
19	-0.9550	-0.9300	-0.9123	-0.9025	-0.8966	-0.8928	-0.8901	-0.8882
18	-0.9749	-0.9600	-0.9452	-0.9367	-0.9315	-0.9281	-0.9258	-0.9241
17	-0.9939	-0.9900	-0.9785	-0.9715	-0.9671	-0.9643	-0.9624	-0.9610
16	-1.0119	-1.0200	-1.0124	-1.0071	-1.0037	-1.0015	-1.0000	-0.9990
15	-1.0288	-1.0500	-1.0467	-1.0435	-1.0413	-1.0399	-1.0389	-1.0382
14	-1.0448	-1.0800	-1.0817	-1.0808	-1.0800	-1.0794	-1.0791	-1.0789
13	-1.0597	-1.1100	-1.1173	-1.1192	-1.1199	-1.1204	-1.1208	-1.1212
12	-1.0736	-1.1400	-1.1537	-1.1587	-1.1613	-1.1630	-1.1643	-1.1653
11	-1.0864	-1.1700	-1.1909	-1.1995	-1.2043	-1.2075	-1.2098	-1.2115
10	-1.0982	-1.2000	-1.2290	-1.2419	-1.2492	-1.2541	-1.2576	-1.2602
9	-1.1089	-1.2300	-1.2683	-1.2860	-1.2964	-1.3032	-1.3081	-1.3118
8	-1.1184	-1.2600	-1.3088	-1.3323	-1.3461	-1.3554	-1.3620	-1.3670
7	-1.1269	-1.2900	-1.3508	-1.3810	-1.3991	-1.4112	-1.4199	-1.4265
6	-1.1342	-1.3200	-1.3946	-1.4329	-1.4561	-1.4717	-1.4829	-1.4914
5	-1.1405	-1.3500	-1.4407	-1.4887	-1.5181	-1.5381	-1.5525	-1.5635
4	-1.1456	-1.3800	-1.4897	-1.5497	-1.5871	-1.6127	-1.6313	-1.6454
3	-1.1496	-1.4100	-1.5427	-1.6181	-1.6661	-1.6993	-1.7235	-1.7420
2	-1.1524	-1.4400	-1.6016	-1.6982	-1.7612	-1.8053	-1.8379	-1.8630
1	-1.1541	-1.4700	-1.6714	-1.8008	-1.8888	-1.9520	-1.9994	-2.0362

Section C-110-6

REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

ASTM International (ASTM)

ASTM E178

Standard Practice for Dealing with Outlying Observations

END OF SECTION C-110

Section C-110-7

Item D-701

Pipe for Storm Drains and Culverts

DESCRIPTION

701-1.1 This item shall consist of the construction of pipe culverts and storm drains in accordance with these specifications and in reasonably close conformity with the lines and grades shown on the plans.

MATERIALS

701-2.1 Materials shall meet the requirements shown on the plans and specified below. Underground piping and components used in drainage systems for terminal and aircraft fueling ramp drainage shall be noncombustible and inert to fuel in accordance with National Fire Protection Association (NFPA) 415.

701-2.2 Pipe. The pipe shall be of the type called for on the plans or in the proposal and shall be in accordance with the following appropriate requirements:

ASTM C76	Standard Specification for Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe
----------	---

701-2.3 Concrete. Not used.

701-2.4 Rubber gaskets. Rubber gaskets for rigid pipe shall conform to the requirements of ASTM C443. Rubber gaskets for PVC pipe, polyethylene, and polypropylene pipe shall conform to the requirements of ASTM F477. Rubber gaskets for zinc-coated steel pipe and precoated galvanized pipe shall conform to the requirements of ASTM D1056, for the "RE" closed cell grades. Rubber gaskets for steel reinforced thermoplastic ribbed pipe shall conform to the requirements of ASTM F477.

701-2.5 Joint mortar. Pipe joint mortar shall consist of one part Portland cement and two parts sand. The Portland cement shall conform to the requirements of ASTM C150, Type I. The sand shall conform to the requirements of ASTM C144.

701-2.6 Joint fillers. Poured filler for joints shall conform to the requirements of ASTM D6690.

701-2.7 Plastic gaskets. Plastic gaskets shall conform to the requirements of ASTM C990.

701-2.8. Controlled low-strength material (CLSM). Controlled low-strength material shall conform to the requirements of Item P-153. When CLSM is used, all joints shall have gaskets.

701-2.9 Precast box culverts. Manufactured in accordance with and conforming to ASTM C1433.

701-2.10 Precast concrete pipe. Precast concrete structures shall be furnished by a plant meeting National Precast Concrete Association Plant Certification Program or another RPR approved third party certification program.

CONSTRUCTION METHODS

701-3.1 Excavation. The width of the pipe trench shall be sufficient to permit satisfactory jointing of the pipe and thorough tamping of the bedding material under and around the pipe, but it shall

not be less than the external diameter of the pipe plus 12 inches (300 mm) on each side. The trench walls shall be approximately vertical.

The Contractor shall comply with all current federal, state and local rules and regulations governing the safety of men and materials during the excavation, installation and backfilling operations. Specifically, the Contractor shall observe that all requirements of the Occupational Safety and Health Administration (OSHA) relating to excavations, trenching and shoring are strictly adhered to. The width of the trench shall be sufficient to permit satisfactorily jointing of the pipe and thorough compaction of the bedding material under the pipe and backfill material around the pipe, but it shall not be greater than the widths shown on the plans trench detail.

Where rock, hardpan, or other unyielding material is encountered, the Contractor shall remove it from below the foundation grade for a depth of at least 8 inch (200 mm) or 1/2 inch (12 mm) for each foot of fill over the top of the pipe (whichever is greater) but for no more than three-quarters of the nominal diameter of the pipe. The excavation below grade should be filled with granular material to form a uniform foundation.

Where a firm foundation is not encountered at the grade established, due to soft, spongy, or other unstable soil, the unstable soil shall be removed and replaced with approved granular material for the full trench width. The RPR shall determine the depth of removal necessary. The granular material shall be compacted to provide adequate support for the pipe.

The excavation for pipes placed in embankment fill shall not be made until the embankment has been completed to a height above the top of the pipe as shown on the plans.

701-3.2 Bedding. The bedding surface for the pipe shall provide a foundation of uniform density to support the pipe throughout its entire length.

a. Rigid pipe. The pipe bedding shall be constructed uniformly for the full length of the pipe barrel, as required on the plans. The maximum aggregate size shall be 1 in when the bedding thickness is less than 6 inches, and 1-1/2 in when the bedding thickness is greater than 6 inches. Bedding shall be loosely placed uncompacted material under the middle third of the pipe prior to placement of the pipe.

b. Flexible pipe. For flexible pipe, the bed shall be roughly shaped to fit the pipe, and a bedding blanket of sand or fine granular material shall be provided as follows:

Flexible Pipe Bedding

Pipe Corrugation Depth		Minimum Bedding Depth	
inch	mm	inch	mm
1/2	12	1	25
1	25	2	50
2	50	3	75
2-1/2	60	3-1/2	90

c. Other pipe materials. For PVC, polyethylene, polypropylene, or fiberglass pipe, the bedding material shall consist of coarse sands and gravels with a maximum particle size of 3/4 inches (19 mm). For pipes installed under paved areas, no more than 12% of the material shall pass the No. 200 (0.075 mm) sieve. For all other areas, no more than 50% of the material shall pass the No. 200 (0.075 mm) sieve. The bedding shall have a thickness of at least 6 inches (150 mm) below

the bottom of the pipe and extend up around the pipe for a depth of not less than 50% of the pipe's vertical outside diameter.

701-3.3 Laying pipe. The pipe laying shall begin at the lowest point of the trench and proceed upgrade. The lower segment of the pipe shall be in contact with the bedding throughout its full length. Bell or groove ends of rigid pipes and outside circumferential laps of flexible pipes shall be placed facing upgrade.

Paved or partially lined pipe shall be placed so that the longitudinal center line of the paved segment coincides with the flow line.

Elliptical and elliptically reinforced concrete pipes shall be placed with the manufacturer's reference lines designating the top of the pipe within five degrees of a vertical plane through the longitudinal axis of the pipe.

701-3.4 Joining pipe. Joints shall be made with (1) cement mortar, (2) cement grout, (3) rubber gaskets, (4) plastic gaskets, (5) coupling bands.

Mortar joints shall be made with an excess of mortar to form a continuous bead around the outside of the pipe and shall be finished smooth on the inside. Molds or runners shall be used for grouted joints to retain the poured grout. Rubber ring gaskets shall be installed to form a flexible watertight seal.

a. Concrete pipe. Concrete pipe may be either bell and spigot or tongue and groove. Pipe sections at joints shall be fully seated and the inner surfaces flush and even. Concrete pipe joints shall be sealed with rubber gaskets meeting ASTM C443.

b. Metal pipe. Metal pipe shall be firmly joined by form-fitting bands conforming to the requirements of ASTM A760 for steel pipe and AASHTO M196 for aluminum pipe.

c. PVC, Polyethylene, or Polypropylene pipe. Joints for PVC, Polyethylene, or Polypropylene pipe shall conform to the requirements of ASTM D3212 when leak resistant joints are required. Joints for PVC and Polyethylene pipe shall conform to the requirements of AASHTO M304 when soil tight joints are required. Fittings for polyethylene pipe shall conform to the requirements of AASHTO M252 or ASTM M294. Fittings for polypropylene pipe shall conform to ASTM F2881, ASTM F2736, or ASTM F2764.

d. Fiberglass pipe. Joints and fittings shall be as detailed on the plans and in accordance with the manufacturers recommendations. Joints shall meet the requirements of ASTM D4161 for flexible elastomeric seals.

701-3.5 Embedment and Overfill. Pipes shall be inspected before any fill material is placed; any pipes found to be out of alignment, unduly settled, or damaged shall be removed and re-laid or replaced at the Contractor's expense.

701-3.5-1 Embedment Material Requirements

a. Concrete Pipe. Embedment material and compaction requirements shall be in accordance with the applicable Type of Standard Installation (Types 1, 2, 3, or 4) per ASTM C1479. If a concrete cradle or CLSM embedment material is used, it shall conform to the plan details.

b. Plastic and fiberglass Pipe. Embedment material shall meet the requirements of ASTM D3282, A-1, A-2-4, A-2-5, or A-3. Embedment material shall be free of organic material, stones larger than 1.5 inches in the greatest dimension, or frozen lumps. Embedment material shall extend to 12 inches above the top of the pipe.

c. Metal Pipe. Embedment material shall be granular as specified in the contract document and specifications, and shall be free of organic material, rock fragments larger than 1.5 inches in the

greatest dimension and frozen lumps. As a minimum, backfill materials shall meet the requirements of ASTM D3282, A-1, A-2, or A-3. Embedment material shall extend to 12 inches above the top of the pipe.

701-3.5-2 Placement of Embedment Material

The embedment material shall be compacted in layers not exceeding 6 inches (150 mm) on each side of the pipe and shall be brought up one foot (30 cm) above the top of the pipe or to natural ground level, whichever is greater. Thoroughly compact the embedment material under the haunches of the pipe without displacing the pipe. Material shall be brought up evenly on each side of the pipe for the full length of the pipe.

When the top of the pipe is above the top of the trench, the embedment material shall be compacted in layers not exceeding 6 inches (150 mm) and shall be brought up evenly on each side of the pipe to one foot (30 cm) above the top of the pipe. All embedment material shall be compacted to a density required under Item P-152.

Concrete cradles and flowable fills, such as controlled low strength material (CLSM) or controlled density fill (CDF), may be used for embedment provided adequate flotation resistance can be achieved by restraints, weighing, or placement technique.

It shall be the Contractor's responsibility to protect installed pipes and culverts from damage due to construction equipment operations. The Contractor shall be responsible for installation of any extra strutting or backfill required to protect pipes from the construction equipment.

701-3.6 Overfill

Pipes shall be inspected before any overfill is in place. Any pipes found to be out of alignment, unduly settled, or damaged shall be removed and relaid or replaced at the Contractor's expense. Evaluation of any damage to RCP shall be evaluated based on AASHTO R73.

Overfill material shall be placed and compacted in layers as required to achieve compaction to at least 95 percent standard proctor per ASTM D1557. The soil shall contain no debris, organic matter, frozen material, or stones with a diameter greater than one half the thickness of the compacted layers being placed.

701-3.7 Inspection Requirements

An initial post installation inspection shall be performed by the RPR no sooner than 30 days after completion of installation and final backfill. Clean or flush all lines prior to inspection.

Reinforced concrete pipe shall be inspected, evaluated, and reported on in accordance with ASTM C1840, "Standard Practice for Inspection and Acceptance of Installed Reinforced Concrete Culvert, Storm Drain, and Storm Sewer Pipe." Any issues reported shall include still photo and video documentation. The zoom ratio shall be provided for all still or video images that document any issues of concern by the inspection firm.

METHOD OF MEASUREMENT

701-4.1 The length of pipe shall be measured in linear feet (m) of pipe in place, completed, and accepted. It shall be measured along the centerline of the pipe from end or inside face of structure to the end or inside face of structure, whichever is applicable. All fittings shall be included in the footage as typical pipe sections in the pipe being measured.

BASIS OF PAYMENT

701-5.0 These prices shall fully compensate the Contractor for furnishing all materials and for all preparation, excavation, and installation of these materials; and for all labor, equipment, tools, and incidentals necessary to complete the item.

701-5.1 Payment will be made at the contract unit price per linear foot (meter) for concrete pipe installed and accepted.

Payment will be made under:

Item 701-5.1 [Size] [Type] per linear foot (meter)

REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

American Association of State Highway and Transportation Officials (AASHTO)

AASHTO M167	Standard Specification for Corrugated Steel Structural Plate, Zinc-Coated, for Field-Bolted Pipe, Pipe-Arches, and Arches
AASHTO M190	Standard Specification for Bituminous-Coated Corrugated Metal Culvert Pipe and Pipe Arches
AASHTO M196	Standard Specification for Corrugated Aluminum Pipe for Sewers and Drains
AASHTO M219	Standard Specification for Corrugated Aluminum Alloy Structural Plate for Field-Bolted Pipe, Pipe-Arches, and Arches
AASHTO M243	Standard Specification for Field Applied Coating of Corrugated Metal Structural Plate for Pipe, Pipe-Arches, and Arches
AASHTO M252	Standard Specification for Corrugated Polyethylene Drainage Pipe
AASHTO M294	Standard Specification for Corrugated Polyethylene Pipe, 300- to 1500-mm (12- to 60-in.) Diameter
AASHTO M304	Standard Specification for Poly (Vinyl Chloride) (PVC) Profile Wall Drain Pipe and Fittings Based on Controlled Inside Diameter
AASHTO MP20	Standard Specification for Steel Reinforced Polyethylene (PE) Ribbed Pipe, 300- to 900-mm (12- to 36-in.) Diameter

ASTM International (ASTM)

ASTM A760	Standard Specification for Corrugated Steel Pipe, Metallic Coated for Sewers and Drains
ASTM A761	Standard Specification for Corrugated Steel Structural Plate, Zinc Coated, for Field-Bolted Pipe, Pipe-Arches, and Arches
ASTM A762	Standard Specification for Corrugated Steel Pipe, Polymer Precoated for Sewers and Drains
ASTM A849	Standard Specification for Post-Applied Coatings, Pavings, and Linings for Corrugated Steel Sewer and Drainage Pipe

ASTM B745	Standard Specification for Corrugated Aluminum Pipe for Sewers and Drains
ASTM C14	Standard Specification for Nonreinforced Concrete Sewer, Storm Drain, and Culvert Pipe
ASTM C76	Standard Specification for Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe
ASTM C94	Standard Specification for Ready Mixed Concrete
ASTM C144	Standard Specification for Aggregate for Masonry Mortar
ASTM C150	Standard Specification for Portland Cement
ASTM C443	Standard Specification for Joints for Concrete Pipe and Manholes, Using Rubber Gaskets
ASTM C506	Standard Specification for Reinforced Concrete Arch Culvert, Storm Drain, and Sewer Pipe
ASTM C507	Standard Specification for Reinforced Concrete Elliptical Culvert, Storm Drain and Sewer Pipe
ASTM C655	Standard Specification for Reinforced Concrete D-Load Culvert, Storm Drain and Sewer Pipe
ASTM C990	Standard Specification for Joints for Concrete Pipe, Manholes, and Precast Box Sections Using Preformed Flexible Joint Sealants
ASTM C1433	Standard Specification for Precast Reinforced Concrete Monolithic Box Sections for Culverts, Storm Drains, and Sewers
ASTM D1056	Standard Specification for Flexible Cellular Materials Sponge or Expanded Rubber
ASTM D3034	Standard Specification for Type PSM Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings
ASTM D3212	Standard Specification for Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals
ASTM D3262	Standard Specification for "Fiberglass" (Glass-Fiber Reinforced Thermosetting Resin) Sewer Pipe
ASTM D3282	Standard Practice for Classification of Soils and Soil-Aggregate Mixtures for Highway Construction Purposes
ASTM D4161	Standard Specification for "Fiberglass" (Glass-Fiber Reinforced Thermosetting Resin) Pipe Joints Using Flexible Elastomeric Seals
ASTM D6690	Standard Specification for Joint and Crack Sealants, Hot Applied, for Concrete and Asphalt Pavements
ASTM F477	Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe
ASTM F667	Standard Specification for 3 through 24 in. Corrugated Polyethylene Pipe and Fittings

ASTM F714	Standard Specification for Polyethylene (PE) Plastic Pipe (DR PR) Based on Outside Diameter
ASTM F794	Standard Specification for Poly (Vinyl Chloride) (PVC) Profile Gravity Sewer Pipe & Fittings Based on Controlled Inside Diameter
ASTM F894	Standard Specification for Polyethylene (PE) Large Diameter Profile Wall Sewer and Drain Pipe
ASTM F949	Standard Specification for Poly (Vinyl Chloride) (PVC) Corrugated Sewer Pipe with a Smooth Interior and Fittings
ASTM F2435	Standard Specification for Steel Reinforced Polyethylene (PE) Corrugated Pipe
ASTM F2562	Specification for Steel Reinforced Thermoplastic Ribbed Pipe and Fittings for Non-Pressure Drainage and Sewerage
ASTM F2736	Standard Specification for 6 to 30 in. (152 to 762 mm) Polypropylene (PP) Corrugated Single Wall Pipe and Double Wall Pipe
ASTM F2764	Standard Specification for 30 to 60 in. (750 to 1500 mm) Polypropylene (PP) Triple Wall Pipe and Fittings for Non-Pressure Sanitary Sewer Applications
ASTM F2881	Standard Specification for 12 to 60 in. (300 to 1500 mm) Polypropylene (PP) Dual Wall Pipe and Fittings for Non-Pressure Storm Sewer Applications
National Fire Protection Association (NFPA)	
NFPA 415	Standard on Airport Terminal Buildings, Fueling Ramp Drainage, and Loading Walkways

END ITEM D-701

Item D-751

Manholes, Catch Basins, Inlets and Inspection Holes

DESCRIPTION

751-1.1 This item shall consist of construction of manholes, catch basins, inlets, and inspection holes, in accordance with these specifications, at the specified locations and conforming to the lines, grades, and dimensions shown on the plans or required by the RPR.

MATERIALS

751-2.1 Brick. The brick shall conform to the requirements of ASTM C32, Grade MS.

751-2.2 Mortar. Mortar shall consist of one part Portland cement and two parts sand. The cement shall conform to the requirements of ASTM C150, Type I. The sand shall conform to the requirements of ASTM C144.

751-2.3 Concrete. Plain and reinforced concrete used in structures, connections of pipes with structures, and the support of structures or frames shall conform to the requirements of Item P-610.

751-2.4 Precast concrete pipe manhole rings. Precast concrete pipe manhole rings shall conform to the requirements of ASTM C478. Unless otherwise specified, the risers and offset cone sections shall have an inside diameter of not less than 36 inches (90 cm) nor more than 48 inches (120 cm). There shall be a gasket between individual sections and sections cemented together with mortar on the inside of the manhole. Gaskets shall conform to the requirements of ASTM C443.

751-2.5 Corrugated metal. Corrugated metal shall conform to the requirements of American Association of State Highway and Transportation Officials (AASHTO) M36.

751-2.6 Frames, covers, and grates. The castings shall conform to one of the following requirements:

- a. ASTM A48, Class 35B: Gray iron castings
- b. ASTM A47: Malleable iron castings
- c. ASTM A27: Steel castings
- d. ASTM A283, Grade D: Structural steel for grates and frames
- e. ASTM A536, Grade 65-45-12: Ductile iron castings
- f. ASTM A897: Austempered ductile iron castings

All castings or structural steel units shall conform to the dimensions shown on the plans and shall be designed to support the loadings, aircraft gear configuration and/or direct loading, specified.

Each frame and cover or grate unit shall be provided with fastening members to prevent it from being dislodged by traffic but which will allow easy removal for access to the structure.

All castings shall be thoroughly cleaned. After fabrication, structural steel units shall be galvanized to meet the requirements of ASTM A123.

751-2.7 Steps. The steps or ladder bars shall be gray or malleable cast iron or galvanized steel. The steps shall be the size, length, and shape shown on the plans and those steps that are not galvanized shall be given a coat of asphalt paint, when directed.

751-2.8 Precast inlet structures. Manufactured in accordance with and conforming to ASTM C913.

CONSTRUCTION METHODS

751-3.1 Unclassified excavation.

a. The Contractor shall excavate for structures and footings to the lines and grades or elevations, shown on the plans, or as staked by the RPR. The excavation shall be of sufficient size to permit the placing of the full width and length of the structure or structure footings shown. The elevations of the bottoms of footings, as shown on the plans, shall be considered as approximately only; and the RPR may direct, in writing, changes in dimensions or elevations of footings necessary for a satisfactory foundation.

b. Boulders, logs, or any other objectionable material encountered in excavation shall be removed. All rock or other hard foundation material shall be cleaned of all loose material and cut to a firm surface either level, stepped, or serrated, as directed by the RPR. All seams or crevices shall be cleaned out and grouted. All loose and disintegrated rock and thin strata shall be removed. Where concrete will rest on a surface other than rock, the bottom of the excavation shall not be disturbed and excavation to final grade shall not be made until immediately before the concrete or reinforcing is placed.

c. The Contractor shall do all bracing, sheathing, or shoring necessary to implement and protect the excavation and the structure as required for safety or conformance to governing laws. The cost of bracing, sheathing, or shoring shall be included in the unit price bid for the structure.

d. All bracing, sheathing, or shoring involved in the construction of this item shall be removed by the Contractor after the completion of the structure. Removal shall not disturb or damage finished masonry. The cost of removal shall be included in the unit price bid for the structure.

e. After excavation is completed for each structure, the Contractor shall notify the RPR. No concrete or reinforcing steel shall be placed until the RPR has approved the depth of the excavation and the character of the foundation material.

751-3.2 Brick structures.

a. Foundations. A prepared foundation shall be placed for all brick structures after the foundation excavation is completed and accepted. Unless otherwise specified, the base shall consist of reinforced concrete mixed, prepared, and placed in accordance with the requirements of Item P-610.

b. Laying brick. All brick shall be clean and thoroughly wet before laying so that they will not absorb any appreciable amount of additional water at the time they are laid. All brick shall be laid in freshly made mortar. Mortar not used within 45 minutes after water has been added shall be discarded. Retempering of mortar shall not be permitted. An ample layer of mortar shall be spread on the beds and a shallow furrow shall be made in it that can be readily closed by the laying of the brick. All bed and head joints shall be filled solid with mortar. End joints of stretchers and side or cross joints of headers shall be fully buttered with mortar and a shoved joint made to squeeze out mortar at the top of the joint. Any bricks that may be loosened after the mortar has taken its set, shall be removed, cleaned, and re-laid with fresh mortar. No broken or chipped brick shall be used in the face, and no spalls or bats shall be used except where necessary to shape around irregular openings or edges; in which case, full bricks shall be placed at ends or corners where possible, and the bats shall be used in the interior of the course. In making closures, no piece of brick shorter than the width of a whole brick shall be used; and wherever practicable, whole brick shall be used and laid as headers.

c. Joints. All joints shall be filled with mortar at every course. Exterior faces shall be laid up in advance of backing. Exterior faces shall be plastered or parged with a coat of mortar not less than 3/8 inch (9 mm) thick before the backing is laid up. Prior to parging, all joints on the back of face courses shall be cut flush. Unless otherwise noted, joints shall be not less than 1/4 inch (6 mm) nor more than 1/2 inch (12 mm) wide and the selected joint width shall be maintained uniform throughout the work.

d. Pointing. Face joints shall be neatly struck, using the weather-struck joint. All joints shall be finished properly as the laying of the brick progresses. When nails or line pins are used, the holes shall be immediately plugged with mortar and pointed when the nail or pin is removed.

e. Cleaning. Upon completion of the work all exterior surfaces shall be thoroughly cleaned by scrubbing and washing with water. If necessary to produce satisfactory results, cleaning shall be done with a 5% solution of muriatic acid which shall then be rinsed off with liberal quantities of water.

f. Curing and cold weather protection. The brick masonry shall be protected and kept moist for at least 48 hours after laying the brick. Brick masonry work or pointing shall not be done when there is frost on the brick or when the air temperature is below 50°F (10°C) unless the Contractor has, on the project ready to use, suitable covering and artificial heating devices necessary to keep the atmosphere surrounding the masonry at a temperature of not less than 60°F (16°C) for the duration of the curing period.

751-3.3 Concrete structures. Concrete structures which are to be cast-in-place within the project boundaries shall be built on prepared foundations, conforming to the dimensions and shape indicated on the plans. The construction shall conform to the requirements specified in Item P-610. Any reinforcement required shall be placed as indicated on the plans and shall be approved by the RPR before the concrete is placed.

All invert channels shall be constructed and shaped accurately to be smooth, uniform, and cause minimum resistance to flowing water. The interior bottom shall be sloped to the outlet.

751-3.4 Precast concrete structures. Precast concrete structures shall be furnished by a plant meeting National Precast Concrete Association Plant Certification Program or another RPR approved third party certification program.

Precast concrete structures shall conform to ASTM C478. Precast concrete structures shall be constructed on prepared or previously placed slab foundations conforming to the dimensions and locations shown on the plans. All precast concrete sections necessary to build a completed structure shall be furnished. The different sections shall fit together readily. Joints between precast concrete risers and tops shall be full-bedded in cement mortar and shall: (1) be smoothed to a uniform surface on both interior and exterior of the structure or (2) utilize a rubber gasket per ASTM C443. The top of the upper precast concrete section shall be suitably formed and dimensioned to receive the metal frame and cover or grate, or other cap, as required. Provision shall be made for any connections for lateral pipe, including drops and leads that may be installed in the structure. The flow lines shall be smooth, uniform, and cause minimum resistance to flow. The metal or metal encapsulated steps that are embedded or built into the side walls shall be aligned and placed in accordance to ASTM C478. When a metal ladder replaces the steps, it shall be securely fastened into position.

751-3.5 Corrugated metal structures. Corrugated metal structures shall be prefabricated. All standard or special fittings shall be furnished to provide pipe connections or branches with the correct dimensions and of sufficient length to accommodate connecting bands. The fittings shall be welded in place to the metal structures. The top of the metal structure shall be designed so that either a concrete slab or metal collar may be attached to allow the fastening of a standard metal frame and grate or cover. Steps or ladders shall be furnished as shown on the plans. Corrugated

metal structures shall be constructed on prepared foundations, conforming to the dimensions and locations as shown on the plans. When indicated, the structures shall be placed on a reinforced concrete base.

751-3.6 Inlet and outlet pipes. Inlet and outlet pipes shall extend through the walls of the structures a sufficient distance beyond the outside surface to allow for connections. They shall be cut off flush with the wall on the inside surface of the structure, unless otherwise directed. For concrete or brick structures, mortar shall be placed around these pipes to form a tight, neat connection.

751-3.7 Placement and treatment of castings, frames, and fittings. All castings, frames, and fittings shall be placed in the positions indicated on the plans or as directed by the RPR, and shall be set true to line and elevation. If frames or fittings are to be set in concrete or cement mortar, all anchors or bolts shall be in place before the concrete or mortar is placed. The unit shall not be disturbed until the mortar or concrete has set.

When frames or fittings are placed on previously constructed masonry, the bearing surface of the masonry shall be brought true to line and grade and shall present an even bearing surface so the entire face or back of the unit will come in contact with the masonry. The unit shall be set in mortar beds and anchored to the masonry as indicated on the plans or as directed by the RPR. All units shall set firm and secure.

After the frames or fittings have been set in final position, the concrete or mortar shall be allowed to harden for seven (7) days before the grates or covers are placed and fastened down.

751-3.8 Installation of steps. The steps shall be installed as indicated on the plans or as directed by the RPR. When the steps are to be set in concrete, they shall be placed and secured in position before the concrete is placed. When the steps are installed in brick masonry, they shall be placed as the masonry is being built. The steps shall not be disturbed or used until the concrete or mortar has hardened for at least seven (7) days. After seven (7) days, the steps shall be cleaned and painted, unless they have been galvanized.

When steps are required with precast concrete structures they shall meet the requirements of ASTM C478. The steps shall be cast into the side of the sections at the time the sections are manufactured or set in place after the structure is erected by drilling holes in the concrete and cementing the steps in place.

When steps are required with corrugated metal structures, they shall be welded into aligned position at a vertical spacing of 12 inches (300 mm).

Instead of steps, prefabricated ladders may be installed. For brick or concrete structures, the ladder shall be held in place by grouting the supports in drilled holes. For metal structures, the ladder shall be secured by welding the top support to the structure and grouting the bottom support into drilled holes in the foundation or as directed by the RPR.

751-3.9 Backfilling.

a. After a structure has been completed, the area around it shall be backfilled with approved material, in horizontal layers not to exceed 8 inches (200 mm) in loose depth, and compacted to the density required in Item P-152. Each layer shall be deposited evenly around the structure to approximately the same elevation. The top of the fill shall meet the elevation shown on the plans or as directed by the RPR.

b. Backfill shall not be placed against any structure until approved by the RPR. For concrete structures, approval shall not be given until the concrete has been in place seven (7) days, or until tests establish that the concrete has attained sufficient strength to withstand any pressure created by the backfill and placing methods.

c. Backfill shall not be measured for direct payment. Performance of this work shall be considered an obligation of the Contractor covered under the contract unit price for the structure involved.

751-3.10 Cleaning and restoration of site. After the backfill is completed, the Contractor shall dispose of all surplus material, dirt, and rubbish from the site. Surplus dirt may be deposited in embankments, shoulders, or as approved by the RPR. The Contractor shall restore all disturbed areas to their original condition. The Contractor shall remove all tools and equipment, leaving the entire site free, clear, and in good condition.

METHOD OF MEASUREMENT

751-4.1 Manholes, catch basins, inlets, and inspection holes shall be measured by the unit.

BASIS OF PAYMENT

751-5.1 The accepted quantities of manholes, catch basins, inlets, and inspection holes will be paid for at the contract unit price per each in place when completed. This price shall be full compensation for furnishing all materials and for all preparation, excavation, backfilling and placing of the materials; furnishing and installation of such specials and connections to pipes and other structures as may be required to complete the item as shown on the plans; and for all labor equipment, tools and incidentals necessary to complete the structure.

Payment will be made under:

Item D-751-5.1	Manholes - per each
Item D-751-5.2	Catch Basins - per each
Item D-751-5.3	Inlets - per each
Item D-751-5.4	Inspection Holes - per each

REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

ASTM International (ASTM)

ASTM A27	Standard Specification for Steel Castings, Carbon, for General Application
ASTM A47	Standard Specification for Ferritic Malleable Iron Castings
ASTM A48	Standard Specification for Gray Iron Castings
ASTM A123	Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
ASTM A283	Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates
ASTM A536	Standard Specification for Ductile Iron Castings
ASTM A897	Standard Specification for Austempered Ductile Iron Castings

ASTM C32	Standard Specification for Sewer and Manhole Brick (Made from Clay or Shale)
ASTM C144	Standard Specification for Aggregate for Masonry Mortar
ASTM C150	Standard Specification for Portland Cement
ASTM C443	Standard Specification for Joints for Concrete Pipe and Manholes, Using Rubber Gaskets.
ASTM C478	Standard Specification for Precast Reinforced Concrete Manhole Sections
ASTM C913	Standard Specification for Precast Concrete Water and Wastewater Structures.
American Association of State Highway and Transportation Officials (AASHTO)	
AASHTO M36	Standard Specification for Corrugated Steel Pipe, Metallic-Coated, for Sewers and Drains

END OF ITEM D-751

Item D-752

Concrete Culverts, Headwalls, and Miscellaneous Drainage Structures

DESCRIPTION

752-1.1 This item shall consist of reinforced concrete culverts, headwalls, and miscellaneous drainage structures constructed in accordance with these specifications, at the specified locations and conforming to the lines, grades, and dimensions shown on the plans or required by the RPR.

MATERIALS

752-2.1 Concrete. Reinforced concrete shall meet the requirements of Item P-610.

CONSTRUCTION METHODS

752-3.1 Unclassified excavation.

a. Trenches and foundation pits for structures or structure footings shall be excavated to the lines and grades and elevations shown on the plans. The excavation shall be of sufficient size to permit the placing of the full width and length of the structure or structure footings shown. The elevations of the bottoms of footings, as shown on the plans, shall be considered as approximate only; and the RPR may approve, in writing, changes in dimensions or elevations of footings necessary to secure a satisfactory foundation.

b. Boulders, logs, or any other objectionable material encountered in excavation shall be removed. All rock or other hard foundation material shall be cleaned of all loose material and cut to a firm surface either level, stepped, or serrated, as directed by the RPR. All seams or crevices shall be cleaned out and grouted. All loose and disintegrated rock and thin strata shall be removed. When concrete will rest on a surface other than rock, the bottom of the excavation shall not be disturbed and excavation to final grade shall not be made until immediately before the concrete or reinforcing steel is placed.

c. The Contractor shall do all bracing, sheathing, or shoring necessary to perform and protect the excavation and the structure as required for safety or conformance to governing laws. The cost of bracing, sheathing, or shoring shall be included in the unit price bid for excavation.

d. All bracing, sheathing, or shoring shall be removed by the Contractor after the completion of the structure. Removal shall not disturb or damage the finished concrete. The cost of removal shall be included in the unit price bid for excavation.

e. After each excavation is completed, the Contractor shall notify the RPR. No concrete or reinforcing steel shall be placed until the RPR has approved the depth of the excavation and the character of the foundation material.

752-3.2 Backfilling.

a. After a structure has been completed, backfilling with approved material shall be accomplished by applying the fill in horizontal layers not to exceed 8 inches (200 mm) in loose depth, and compacted. The field density of the compacted material shall be at least 90% of the maximum density for cohesive soils and 95% of the maximum density for noncohesive soils. The maximum density shall be determined in accordance with ASTM D698. The field density shall be determined in accordance with ASTM D1556.

b. No backfilling shall be placed against any structure until approved by the RPR. For concrete, approval shall not be given until the concrete has been in place seven (7) days, or until tests establish that the concrete has attained sufficient strength to withstand any pressure created by the backfill or the placement methods.

c. Fill placed around concrete culverts shall be deposited on each side at the same time and to approximately the same elevation. All slopes bounding or within the areas to be backfilled shall be stepped or serrated to prevent wedge action against the structure.

d. Backfill will not be measured for direct payment. Performance of this work shall be considered as a subsidiary obligation of the Contractor, covered under the contract unit price for “unclassified excavation for structures.”

752-3.3 Weep holes. Weep holes shall be constructed as shown on the plans.

752-3.4 Cleaning and restoration of site. After the backfill is completed, the Contractor shall dispose of all surplus material, dirt, and rubbish from the site. Surplus dirt may be deposited in embankment, shoulders, or as approved by the RPR. The Contractor shall restore all disturbed areas to their original condition. The Contractor shall remove all tools and equipment, leaving the entire site free, clear, and in good condition.

METHOD OF MEASUREMENT

752-4.1 The quantity of drainage structures shall be measured per each, complete in place and accepted.

BASIS OF PAYMENT

752-5.1 Payment will be made at the contract unit price per each for drainage structures.

Payment will be made under:

Item D-752-5.1 (Size) (Type Drainage Structure) - per each

REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

ASTM International (ASTM)

ASTM D698 Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lb/ft³ (600 kN-m/m³))

ASTM D1556 Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method

END OF ITEM D-752

Item F-162

Chain-Link Fence

DESCRIPTION

162-1.1 This item shall consist of furnishing and erecting a chain-link fence in accordance with these specifications, the details shown on the plans, and in conformity with the lines and grades shown on the plans or established by the RPR.

MATERIALS

162-2.1 Fabric. The fabric shall be woven with a 9-gauge galvanized steel wire in a 2-inch (50 mm) mesh and shall meet the requirements of ASTM A392, Class 2. The fabric shall be woven from a 9-gauge aluminum-coated steel wire in a 2-inch (50 mm) mesh and shall conform to the requirements of ASTM A491.

162-2.2 Barbed wire. Barbed wire shall be 2-strand 12-1/2-gauge zinc-coated wire with 4-point barbs and shall conform to the requirements of ASTM A121, Class 3 chain link fence grade.

162-2.3 Posts, rails, and braces. Line posts, rails, and braces shall conform to the requirements of ASTM F1043 or ASTM F1083 as follows:

- Galvanized tubular steel pipe shall conform to the requirements of Group IA, (Schedule 40) coatings conforming to Type A, or Group IC (High Strength Pipe), External coating Type B, and internal coating Type B or D.

Posts, rails, and braces, with the exception of galvanized steel conforming to ASTM F1043 or ASTM F1083, Group 1A, Type A, or aluminum alloy, shall demonstrate the ability to withstand testing in salt spray in accordance with ASTM B117 as follows:

External: 1,000 hours with a maximum of 5% red rust.

Internal: 650 hours with a maximum of 5% red rust.

The dimensions of the posts, rails, and braces shall be in accordance with Tables I through VI of Federal Specification RR-F-191/3.

162-2.4 Gates. Gate frames shall consist of galvanized steel pipe and shall conform to the specifications for the same material under paragraph 162-2.3. The fabric shall be of the same type material as used in the fence.

162-2.5 Wire ties and tension wires. Wire ties for use in conjunction with a given type of fabric shall be of the same material and coating weight identified with the fabric type. Tension wire shall be 7-gauge marcelled steel wire with the same coating as the fabric type and shall conform to ASTM A824.

All material shall conform to Federal Specification RR-F-191/4.

162-2.6 Miscellaneous fittings and hardware. Miscellaneous steel fittings and hardware for use with zinc-coated steel fabric shall be of commercial grade steel or better quality, wrought or cast as appropriate to the article, and sufficient in strength to provide a balanced design when used in conjunction with fabric posts, and wires of the quality specified herein. All steel fittings and hardware shall be protected with a zinc coating applied in conformance with ASTM A153. Barbed

wire support arms shall withstand a load of 250 pounds (113 kg) applied vertically to the outermost end of the arm.

162-2.7 Concrete. Concrete shall have a minimum 28-day compressive strength of 3000 psi (2670 kPa).

162-2.8 Marking. Each roll of fabric shall carry a tag showing the kind of base metal (steel, aluminum, or aluminum alloy number), kind of coating, the gauge of the wire, the length of fencing in the roll, and the name of the manufacturer. Posts, wire, and other fittings shall be identified as to manufacturer, kind of base metal (steel, aluminum, or aluminum alloy number), and kind of coating.

CONSTRUCTION METHODS

162-3.1 General. The fence shall be constructed in accordance with the details on the plans and as specified here using new materials. All work shall be performed in a workmanlike manner satisfactory to the RPR. The Contractor shall layout the fence line based on the plans. The Contractor shall span the opening below the fence with barbed wire at all locations where it is not practical to conform the fence to the general contour of the ground surface because of natural or manmade features such as drainage ditches. The new fence shall be permanently tied to the terminals of existing fences as shown on the plans. The Contractor shall stake down the woven wire fence at several points between posts as shown on the plans.

The Contractor shall arrange the work so that construction of the new fence will immediately follow the removal of existing fences. The length of unfenced section at any time shall not exceed 300 feet (90 m). The work shall progress in this manner and at the close of the working day the newly constructed fence shall be tied to the existing fence.

162-3.2 Clearing fence line. Clearing shall consist of the removal of all stumps, brush, rocks, trees, or other obstructions that will interfere with proper construction of the fence. Stumps within the cleared area of the fence shall be grubbed or excavated. The bottom of the fence shall be placed a uniform distance above ground, as specified in the plans. When shown on the plans or as directed by the RPR, the existing fences which interfere with the new fence location shall be removed by the Contractor as a part of the construction work unless such removal is listed as a separate item in the bid schedule. All holes remaining after post and stump removal shall be refilled with suitable soil, gravel, or other suitable material and compacted with tampers.

The cost of removing and disposing of the material shall not constitute a pay item and shall be considered incidental to fence construction.

162-3.3 Installing posts. All posts shall be set in concrete at the required dimension and depth and at the spacing shown on the plans.

The concrete shall be thoroughly compacted around the posts by tamping or vibrating and shall have a smooth finish slightly higher than the ground and sloped to drain away from the posts. All posts shall be set plumb and to the required grade and alignment. No materials shall be installed on the posts, nor shall the posts be disturbed in any manner within seven (7) days after the individual post footing is completed.

Should rock be encountered at a depth less than the planned footing depth, a hole 2 inches (50 mm) larger than the greatest dimension of the posts shall be drilled to a depth of 12 inches (300 mm). After the posts are set, the remainder of the drilled hole shall be filled with grout, composed of one part Portland cement and two parts mortar sand. Any remaining space above the rock shall be filled with concrete in the manner described above.

In lieu of drilling, the rock may be excavated to the required footing depth. No extra compensation shall be made for rock excavation.

162-3.4 Installing top rails. The top rail shall be continuous and shall pass through the post tops. The coupling used to join the top rail lengths shall allow for expansion.

162-3.5 Installing braces. Horizontal brace rails, with diagonal truss rods and turnbuckles, shall be installed at all terminal posts.

162-3.6 Installing fabric. The wire fabric shall be firmly attached to the posts and braced as shown on the plans. All wire shall be stretched taut and shall be installed to the required elevations. The fence shall generally follow the contour of the ground, with the bottom of the fence fabric no less than one inch (25 mm) or more than 4 inches (100 mm) from the ground surface. Grading shall be performed where necessary to provide a neat appearance.

At locations of small natural swales or drainage ditches and where it is not practical to have the fence conform to the general contour of the ground surface, longer posts may be used and multiple strands of barbed wire stretched to span the opening below the fence. The vertical clearance between strands of barbed wire shall be 6 inches (150 mm) or less.

162-3.7 Electrical grounds. Electrical grounds shall be constructed at 500 feet (150 m) intervals. The ground shall be accomplished with a copper clad rod 8 feet (2.4 m) long and a minimum of 5/8 inches (16 mm) in diameter driven vertically until the top is 6 inches (150 mm) below the ground surface. A No. 6 solid copper conductor shall be clamped to the rod and to the fence in such a manner that each element of the fence is grounded. Installation of ground rods shall not constitute a pay item and shall be considered incidental to fence construction. The Contractor shall comply with FAA-STD-019, Lightning and Surge Protection, Grounding, Bonding and Shielding Requirements for Facilities and Electronic Equipment, paragraph 4.2.3.8, Lightning Protection for Fences and Gates, when fencing is adjacent to FAA facilities.

162-3.8 Cleaning up. The Contractor shall remove from the vicinity of the completed work all tools, buildings, equipment, etc., used during construction. All disturbed areas shall be seeded per T-901.

METHOD OF MEASUREMENT

162-4.1 Chain-link fence will be measured for payment by the linear foot (meter). Measurement will be along the top of the fence from center to center of end posts, excluding the length occupied by gate openings.

162-4.2 Gates will be measured as complete units.

BASIS OF PAYMENT

162-5.1 Payment for chain-link fence will be made at the contract unit price per linear foot (meter).

162-5.2 Payment for vehicle or pedestrian gates will be made at the contract unit price for each gate.

The price shall be full compensation for furnishing all materials, and for all preparation, erection, and installation of these materials, and for all labor equipment, tools, and incidentals necessary to complete the item. The price for the pedestrian gate shall include mechanical locks as noted on the plans.

Payment will be made under:

Item F-162-5.1	Chain-Link Fence - per linear foot (meter)
Item F-162-5.2a	[Size] [Type] Gate - per each

REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

ASTM International (ASTM)

ASTM A121	Standard Specification for Metallic-Coated Carbon Steel Barbed Wire
ASTM A153	Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware
ASTM A392	Standard Specification for Zinc-Coated Steel Chain-Link Fence Fabric
ASTM A491	Standard Specification for Aluminum-Coated Steel Chain-Link Fence Fabric
ASTM A824	Standard Specification for Metallic-Coated Steel Marcellled Tension Wire for Use with Chain Link Fence
ASTM B117	Standard Practice for Operating Salt Spray (Fog) Apparatus
ASTM F668	Standard Specification for Polyvinyl Chloride (PVC), Polyolefin and other Organic Polymer Coated Steel Chain-Link Fence Fabric
ASTM F1043	Standard Specification for Strength and Protective Coatings on Steel Industrial Fence Framework
ASTM F1083	Standard Specification for Pipe, Steel, Hot-Dipped Zinc-Coated (Galvanized) Welded, for Fence Structures
ASTM F1183	Standard Specification for Aluminum Alloy Chain Link Fence Fabric
ASTM F1345	Standard Specification for Zinc 5% Aluminum-Mischmetal Alloy Coated Steel Chain-Link Fence Fabric
ASTM G152	Standard Practice for Operating Open Flame Carbon Arc Light Apparatus for Exposure of Nonmetallic Materials
ASTM G153	Standard Practice for Operating Enclosed Carbon Arc Light Apparatus for Exposure of Nonmetallic Materials
ASTM G154	Standard Practice for Operating Fluorescent Ultraviolet (UV) Lamp Apparatus for Exposure of Nonmetallic Materials
ASTM G155	Standard Practice for Operating Xenon Arc Light Apparatus for Exposure of Nonmetallic Materials

Federal Specifications (FED SPEC)

FED SPEC RR-F-191/3	Fencing, Wire and Post, Metal (Chain-Link Fence Posts, Top Rails and Braces)
---------------------	--

FED SPEC RR-F-191/4 Fencing, Wire and Post, Metal (Chain-Link Fence Accessories)

FAA Standard

FAA-STD-019 Lightning and Surge Protection, Grounding, Bonding and Shielding Requirements for Facilities and Electronic Equipment

FAA Orders

5300.38 AIP Handbook

END OF ITEM F-162

Item L-110

Airport Underground Electrical Duct Banks and Conduits

DESCRIPTION

110-1.1 This item shall consist of underground electrical conduits and duct banks (single or multiple conduits encased in concrete or buried in sand) installed per this specification at the locations and per the dimensions, designs, and details shown on the plans. This item shall include furnishing and installing of all underground electrical duct banks and individual and multiple underground conduits. It shall also include all turfing trenching, backfilling, removal, and restoration of any paved or turfed areas; concrete encasement, mandrelling, pulling lines, duct markers, plugging of conduits, and the testing of the installation as a completed system ready for installation of cables per the plans and specifications. This item shall also include furnishing and installing conduits and all incidentals for providing positive drainage of the system. Verification of existing ducts is incidental to the pay items provided in this specification.

EQUIPMENT AND MATERIALS

110-2.1 General.

a. All equipment and materials covered by referenced specifications shall be subject to acceptance through manufacturer's certification of compliance with the applicable specification when requested by the RPR.

b. Manufacturer's certifications shall not relieve the Contractor of the responsibility to provide materials per these specifications and acceptable to the RPR. Materials supplied and/or installed that do not comply with these specifications shall be removed, when directed by the RPR and replaced with materials, that comply with these specifications, at the Contractor's cost.

c. All materials and equipment used to construct this item shall be submitted to the RPR for approval prior to ordering the equipment. Submittals consisting of marked catalog sheets or shop drawings shall be provided. Submittal data shall be presented in a clear, precise and thorough manner. Original catalog sheets are preferred. Photocopies are acceptable provided they are as good a quality as the original. Clearly and boldly mark each copy to identify products or models applicable to this project. Indicate all optional equipment and delete non-pertinent data. Submittals for components of electrical equipment and systems shall identify the equipment for which they apply on each submittal sheet. Markings shall be made bold and clear with arrows or circles (highlighting is not acceptable). The Contractor is solely responsible for delays in project that accrue directly or indirectly from late submissions or resubmissions of submittals.

d. The data submitted shall be sufficient, in the opinion of the RPR, to determine compliance with the plans and specifications. The Contractor's submittals shall be electronically submitted in pdf format, tabbed by specification section. The RPR reserves the right to reject any and all equipment, materials or procedures that do not meet the system design and the standards and codes specified in this document.

e. All equipment and materials furnished and installed under this section shall be guaranteed against defects in materials and workmanship for a period of at least twelve (12) months from final acceptance by the Owner. The defective materials and/or equipment shall be repaired or replaced, at the Owner's discretion, with no additional cost to the Owner.

110-2.2 Steel conduit. Rigid galvanized steel (RGS) conduit and fittings shall be hot dipped galvanized inside and out and conform to the requirements of Underwriters Laboratories Standards 6, 514B, and 1242. All RGS conduits or RGS elbows installed below grade, in concrete, permanently wet locations or other similar environments shall be painted with a 10-mil thick coat of asphaltum sealer or shall have a factory-bonded polyvinyl chloride (PVC) cover. Any exposed galvanizing or steel shall be coated with 10 mils of asphaltum sealer. When using PVC coated RGS conduit, care shall be exercised not to damage the factory PVC coating. Damaged PVC coating shall be repaired per the manufacturer's written instructions. In lieu of PVC coated RGS, corrosion wrap tape shall be permitted to be used where RGS is in contact with direct earth.”

110-2.3 Plastic conduit. Plastic conduit and fittings shall conform to the following requirements:

- UL 514B covers W-C-1094-Conduit fittings all types, classes 1 thru 3 and 6 thru 10.
- UL 514C covers W-C-1094- all types, Class 5 junction box and cover in plastic (PVC).
- UL 651 covers W-C-1094-Rigid PVC Conduit, types I and II, Class 4.
- UL 651A covers W-C-1094-Rigid PVC Conduit and high-density polyethylene (HDPE) Conduit type III and Class 4.

Underwriters Laboratories Standards UL-651 and Article 352 of the current National Electrical Code shall be one of the following, as shown on the plans:

a. Type I—Schedule 40 and Schedule 80 PVC suitable for underground use either direct-buried or encased in concrete.

b. Type II—Schedule 40 PVC suitable for either above ground or underground use.

c. Type III – Schedule 80 PVC suitable for either above ground or underground use either direct-buried or encased in concrete.

d. Type III –HDPE pipe, minimum standard dimensional ratio (SDR) 11, suitable for placement with directional boring under pavement.

The type of solvent cement shall be as recommended by the conduit/fitting manufacturer.

110-2.4 Split conduit. Split conduit shall be pre-manufactured for the intended purpose and shall be made of steel or plastic.

110-2.5 Conduit spacers. Conduit spacers shall be prefabricated interlocking units manufactured for the intended purpose. They shall be of double wall construction made of high grade, high density polyethylene complete with interlocking cap and base pads. They shall be designed to accept No. 4 reinforcing bars installed vertically.

110-2.6 Concrete. Concrete shall be proportioned, placed, and cured per Item P-610, Concrete for Miscellaneous Structures.

110-2.7 Precast concrete structures. Precast concrete structures shall be furnished by a plant meeting National Precast Concrete Association Plant Certification Program or another RPR approved third party certification program. Precast concrete structures shall conform to ASTM C478.

110-2.8 Flowable backfill. Flowable material used to back fill conduit and duct bank trenches shall conform to the requirements of Item P-153, Controlled Low Strength Material.

110-2.9 Detectable warning tape. Plastic, detectable, American Public Works Association (APWA) red (electrical power lines, cables, conduit and lighting cable), orange (telephone/fiber optic cabling) with continuous legend magnetic tape shall be polyethylene film with a metallized

foil core and shall be 3-6 inches (75-150 mm) wide. Detectable tape is incidental to the respective bid item.

CONSTRUCTION METHODS

110-3.1 General. The Contractor shall install underground duct banks and conduits at the approximate locations indicated on the plans. The RPR shall indicate specific locations as the work progresses, if required to differ from the plans. Duct banks and conduits shall be of the size, material, and type indicated on the plans or specifications. Where no size is indicated on the plans or in the specifications, conduits shall be not less than 2 inches (50 mm) inside diameter or comply with the National Electrical Code based on cable to be installed, whichever is larger. All duct bank and conduit lines shall be laid so as to grade toward access points and duct or conduit ends for drainage. Unless shown otherwise on the plans, grades shall be at least 3 inches (75 mm) per 100 feet (30 m). On runs where it is not practicable to maintain the grade all one way, the duct bank and conduit lines shall be graded from the center in both directions toward access points or conduit ends, with a drain into the storm drainage system. Pockets or traps where moisture may accumulate shall be avoided. Under pavement, the top of the duct bank shall not be less than 18 inches (0.5 m) below the subgrade; in other locations, the top of the duct bank or underground conduit shall be not less than 18 inches (0.5 m) below finished grade.

The Contractor shall mandrel each individual conduit whether the conduit is direct-buried or part of a duct bank. An iron-shod mandrel, not more than 1/4 inch (6 mm) smaller than the bore of the conduit shall be pulled or pushed through each conduit. The mandrel shall have a leather or rubber gasket slightly larger than the conduit hole.

The Contractor shall swab out all conduits/ducts and clean base can, manhole, pull boxes, etc., interiors immediately prior to pulling cable. Once cleaned and swabbed the light bases, manholes, pull boxes, etc., and all accessible points of entry to the duct/conduit system shall be kept closed except when installing cables. Cleaning of ducts, base cans, manholes, etc., is incidental to the pay item of the item being cleaned. All raceway systems left open, after initial cleaning, for any reason shall be recleaned at the Contractor's expense. All accessible points shall be kept closed when not installing cable. The Contractor shall verify existing ducts proposed for use in this project as clear and open. The Contractor shall notify the RPR of any blockage in the existing ducts.

For pulling the permanent wiring, each individual conduit, whether the conduit is direct-buried or part of a duct bank, shall be provided with a 200-pound (90 kg) test polypropylene pull rope. The ends shall be secured and sufficient length shall be left in access points to prevent it from slipping back into the conduit. Where spare conduits are installed, as indicated on the plans, the open ends shall be plugged with removable tapered plugs, designed for this purpose.

All conduits shall be securely fastened in place during construction and shall be plugged to prevent contaminants from entering the conduits. Any conduit section having a defective joint shall not be installed. Ducts shall be supported and spaced apart using approved spacers at intervals not to exceed 5 feet (1.5 m).

Unless otherwise shown on the plans, concrete encased duct banks shall be used when crossing under pavements expected to carry aircraft loads, such as runways, taxiways, taxilanes, ramps and aprons. When under paved shoulders and other paved areas, conduit and duct banks shall be encased using flowable fill for protection.

All conduits within concrete encasement of the duct banks shall terminate with female ends for ease in current and future use. Install factory plugs in all unused ends. Do not cover the ends or plugs with concrete.

Where turf is well established and the sod can be removed, it shall be carefully stripped and properly stored.

Trenches for conduits and duct banks may be excavated manually or with mechanical trenching equipment unless in pavement, in which case they shall be excavated with mechanical trenching equipment. Walls of trenches shall be essentially vertical so that a minimum of shoulder surface is disturbed. Blades of graders shall not be used to excavate the trench.

When rock is encountered, the rock shall be removed to a depth of at least 3 inches (75 mm) below the required conduit or duct bank depth and it shall be replaced with bedding material of earth or sand containing no mineral aggregate particles that would be retained on a 1/4-inch (6.3 mm) sieve. Flowable backfill may alternatively be used

Underground electrical warning (Caution) tape shall be installed in the trench above all underground duct banks and conduits in unpaved areas. Contractor shall submit a sample of the proposed warning tape for approval by the RPR. If not shown on the plans, the warning tape shall be located 6 inches above the duct/conduit or the counterpoise wire if present.

Joints in plastic conduit shall be prepared per the manufacturer's recommendations for the particular type of conduit. Plastic conduit shall be prepared by application of a plastic cleaner and brushing a plastic solvent on the outside of the conduit ends and on the inside of the couplings. The conduit fitting shall then be slipped together with a quick one-quarter turn twist to set the joint tightly. Where more than one conduit is placed in a single trench, or in duct banks, joints in the conduit shall be staggered a minimum of 2 feet (60 cm).

Changes in direction of runs exceeding 10 degrees, either vertical or horizontal, shall be accomplished using manufactured sweep bends.

Whether or not specifically indicated on the drawings, where the soil encountered at established duct bank grade is an unsuitable material, as determined by the RPR, the unsuitable material shall be removed per Item P-152 and replaced with suitable material. Additional duct bank supports shall be installed, as approved by the RPR.

All excavation shall be unclassified and shall be considered incidental to Item L-110. Dewatering necessary for duct installation, and erosion per federal, state, and local requirements is incidental to Item L-110.

Unless otherwise specified, excavated materials that are deemed by the RPR to be unsuitable for use in backfill or embankments shall be removed and disposed of offsite.

Any excess excavation shall be filled with suitable material approved by the RPR and compacted per Item P-152.

It is the Contractor's responsibility to locate existing utilities within the work area prior to excavation. Where existing active cables cross proposed installations, the Contractor shall ensure that these cables are adequately protected. Where crossings are unavoidable, no splices will be allowed in the existing cables, except as specified on the plans. Installation of new cable where such crossings must occur shall proceed as follows:

a. Existing cables shall be located manually. Unearthed cables shall be inspected to assure absolutely no damage has occurred

b. Trenching, etc., in cable areas shall then proceed with approval of the RPR, with care taken to minimize possible damage or disruption of existing cable, including careful backfilling in area of cable.

In the event that any previously identified cable is damaged during the course of construction, the Contractor shall be responsible for the complete repair.

110-3.2 Duct banks. Unless otherwise shown in the plans, duct banks shall be installed so that the top of the concrete envelope is not less than 18 inches (0.5 m) below the bottom of the base or stabilized base course layers where installed under runways, taxiways, aprons, or other paved areas, and not less than 18 inches (0.5 m) below finished grade where installed in unpaved areas.

Unless otherwise shown on the plans, duct banks under paved areas shall extend at least 3 feet (1 m) beyond the edges of the pavement or 3 feet (1 m) beyond any under drains that may be installed alongside the paved area. Trenches for duct banks shall be opened the complete length before concrete is placed so that if any obstructions are encountered, provisions can be made to avoid them. Unless otherwise shown on the plans, all duct banks shall be placed on a layer of concrete not less than 3 inches (75 mm) thick prior to its initial set. The Contractor shall space the conduits not less than 3 inches (75 mm) apart (measured from outside wall to outside wall). All such multiple conduits shall be placed using conduit spacers applicable to the type of conduit. As the conduit laying progresses, concrete shall be placed around and on top of the conduits not less than 3 inches (75 mm) thick unless otherwise shown on the plans. All conduits shall terminate with female ends for ease of access in current and future use. Install factory plugs in all unused ends. Do not cover the ends or plugs with concrete.

Conduits forming the duct bank shall be installed using conduit spacers. No. 4 reinforcing bars shall be driven vertically into the soil a minimum of 6 inches (150 mm) to anchor the assembly into the earth prior to placing the concrete encasement. For this purpose, the spacers shall be fastened down with locking collars attached to the vertical bars. Spacers shall be installed at 5-foot (1.5-m) intervals. Spacers shall be in the proper sizes and configurations to fit the conduits. Locking collars and spacers shall be submitted to the RPR for review prior to use.

When specified, the Contractor shall reinforce the bottom side and top of encasements with steel reinforcing mesh or fabric or other approved metal reinforcement. When directed, the Contractor shall supply additional supports where the ground is soft and boggy, where ducts cross under roadways, or where shown on the plans. Under such conditions, the complete duct structure shall be supported on reinforced concrete footings, piers, or piles located at approximately 5-foot (1.5-m) intervals.

All pavement surfaces that are to have ducts installed therein shall be neatly saw cut to form a vertical face. All excavation shall be included in the contract with price for the duct.

Install a plastic, detectable, color as noted, 3 to 6 inches (75 to 150 mm) wide tape, 8 inches (200 mm) minimum below grade above all underground conduit or duct lines not installed under pavement. Utilize the 3-inch (75-mm) wide tape only for single conduit runs. Utilize the 6-inch (150-mm) wide tape for multiple conduits and duct banks. For duct banks equal to or greater than 24 inches (600 mm) in width, utilize more than one tape for sufficient coverage and identification of the duct bank as required.

When existing cables are to be placed in split duct, encased in concrete, the cable shall be carefully located and exposed by hand tools. Prior to being placed in duct, the RPR shall be notified so that he may inspect the cable and determine that it is in good condition. Where required, split duct shall be installed as shown on the drawings or as required by the RPR.

110-3.3 Conduits without concrete encasement. Trenches for single-conduit lines shall be not less than 6 inches (150 mm) nor more than 12 inches (300 mm) wide. The trench for 2 or more conduits installed at the same level shall be proportionately wider. Trench bottoms for conduits without concrete encasement shall be made to conform accurately to grade so as to provide uniform support for the conduit along its entire length.

Unless otherwise shown on the plans, a layer of fine earth material, at least 4 inches (100 mm) thick (loose measurement) shall be placed in the bottom of the trench as bedding for the conduit. The

bedding material shall consist of soft dirt, sand or other fine fill, and it shall contain no particles that would be retained on a 1/4-inch (6.3 mm) sieve. The bedding material shall be tamped until firm. Flowable backfill may alternatively be used.

Unless otherwise shown on plans, conduits shall be installed so that the tops of all conduits within the Airport's secured area where trespassing is prohibited are at least 18 inches (0.5 m) below the finished grade. Conduits outside the Airport's secured area shall be installed so that the tops of the conduits are at least 24 inches (60 cm) below the finished grade per National Electric Code (NEC), Table 300.5.

When two or more individual conduits intended to carry conductors of equivalent voltage insulation rating are installed in the same trench without concrete encasement, they shall be spaced not less than 3 inches (75 mm) apart (measured from outside wall to outside wall) in a horizontal direction and not less than 6 inches (150 mm) apart in a vertical direction. Where two or more individual conduits intended to carry conductors of differing voltage insulation rating are installed in the same trench without concrete encasement, they shall be placed not less than 3 inches (75 mm) apart (measured from outside wall to outside wall) in a horizontal direction and not less than 6 inches (150 mm) apart in a vertical direction.

Trenches shall be opened the complete length between normal termination points before conduit is installed so that if any unforeseen obstructions are encountered, proper provisions can be made to avoid them.

Conduits shall be installed using conduit spacers. No. 4 reinforcing bars shall be driven vertically into the soil a minimum of 6 inches (150 mm) to anchor the assembly into the earth while backfilling. For this purpose, the spacers shall be fastened down with locking collars attached to the vertical bars. Spacers shall be installed at 5-foot (1.5-m) intervals. Spacers shall be in the proper sizes and configurations to fit the conduits. Locking collars and spacers shall be submitted to the RPR for review prior to use.

110-3.4 Markers. The location of each end and of each change of direction of conduits and duct banks shall be marked by a concrete slab marker 2 feet (60 cm) square and 4 - 6 inches (100 - 150 mm) thick extending approximately one inch (25 mm) above the surface. The markers shall also be located directly above the ends of all conduits or duct banks, except where they terminate in a junction/access structure or building. Each cable or duct run from a line of lights and signs to the equipment vault must be marked at approximately every 200 feet (61 m) along the cable or duct run, with an additional marker at each change of direction of cable or duct run.

The Contractor shall impress the word "DUCT" or "CONDUIT" on each marker slab. Impression of letters shall be done in a manner, approved by the RPR, for a neat, professional appearance. All letters and words must be neatly stenciled. After placement, all markers shall be given one coat of high-visibility orange paint, as approved by the RPR. The Contractor shall also impress on the slab the number and size of conduits beneath the marker along with all other necessary information as determined by the RPR. The letters shall be 4 inches (100 mm) high and 3 inches (75 mm) wide with width of stroke 1/2 inch (12 mm) and 1/4 inch (6 mm) deep or as large as the available space permits. Furnishing and installation of duct markers is incidental to the respective duct pay item.

110-3.5 Backfilling for conduits. For conduits, 8 inches (200 mm) of sand, soft earth, or other fine fill (loose measurement) shall be placed around the conduits ducts and carefully tamped around and over them with hand tampers. The remaining trench shall then be backfilled and compacted per Item P-152 except that material used for back fill shall be select material not larger than 4 inches (100 mm) in diameter.

Flowable backfill may alternatively be used.

Trenches shall not contain pools of water during back filling operations.

The trench shall be completely backfilled and tamped level with the adjacent surface; except that, where sod is to be placed over the trench, the backfilling shall be stopped at a depth equal to the thickness of the sod to be used, with proper allowance for settlement.

Any excess excavated material shall be removed and disposed of per instructions issued by the RPR.

110-3.6 Backfilling for duct banks. After the concrete has cured, the remaining trench shall be backfilled and compacted per Item P-152 "Excavation and Embankment" except that the material used for backfill shall be select material not larger than 4 inches (100 mm) in diameter. In addition to the requirements of Item P-152, where duct banks are installed under pavement, one moisture/density test per lift shall be made for each 250 linear feet (76 m) of duct bank or one work period's construction, whichever is less.

Flowable backfill may alternatively be used.

Trenches shall not contain pools of water during backfilling operations.

The trench shall be completely backfilled and tamped level with the adjacent surface; except that, where sod is to be placed over the trench, the backfilling shall be stopped at a depth equal to the thickness of the sod to be used, with proper allowance for settlement.

Any excess excavated material shall be removed and disposed of per instructions issued by the RPR.

110-3.7 Restoration. Where sod has been removed, it shall be replaced as soon as possible after the backfilling is completed. All areas disturbed by the work shall be restored to its original condition. The restoration shall include topsoiling, fertilizing, liming, seeding, and mulching shown on the plans. The Contractor shall be held responsible for maintaining all disturbed surfaces and replacements until final acceptance. All restoration shall be considered incidental to the respective L-110 pay item. Following restoration of all trenching near airport movement surfaces, the Contractor shall thoroughly visually inspect the area for foreign object debris (FOD), and remove any such FOD that is found. This FOD inspection and removal shall be considered incidental to the pay item of which it is a component part.

METHOD OF MEASUREMENT

110-4.1 Underground conduits and duct banks shall be measured by the linear feet (meter) of conduits and duct banks installed, including encasement, locator tape, trenching and backfill with designated material, and restoration, and for drain lines, the termination at the drainage structure, all measured in place, completed, and accepted. Separate measurement shall be made for the various types and sizes.

BASIS OF PAYMENT

110-5.1 Payment will be made at the contract unit price per linear foot for each type and size of conduit and duct bank completed and accepted, including trench and backfill with the designated material, and, for drain lines, the termination at the drainage structure. This price shall be full compensation for removal and disposal of existing duct banks and conduits as shown on the plans, furnishing all materials and for all preparation, assembly, and installation of these materials, and for all labor, equipment, tools, and incidentals necessary to complete this item per the provisions and intent of the plans and specifications.

Payment will be made under:

- | | |
|----------------|---|
| Item L-110-5.1 | 2 Concrete Encased Electrical Duct Bank, 4"-way- per linear foot (meter) |
| Item L-110-5.2 | 2" Concrete Encased Non-Encased Electrical Conduit, - per linear foot (meter) |

REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

Advisory Circular (AC)

- | | |
|----------------|---|
| AC 150/5340-30 | Design and Installation Details for Airport Visual Aids |
| AC 150/5345-53 | Airport Lighting Equipment Certification Program |

ASTM International (ASTM)

- | | |
|-----------|--|
| ASTM A615 | Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement |
|-----------|--|

National Fire Protection Association (NFPA)

- | | |
|---------|--------------------------------|
| NFPA-70 | National Electrical Code (NEC) |
|---------|--------------------------------|

Underwriters Laboratories (UL)

- | | |
|------------------|---|
| UL Standard 6 | Electrical Rigid Metal Conduit - Steel |
| UL Standard 514B | Conduit, Tubing, and Cable Fittings |
| UL Standard 514C | Nonmetallic Outlet Boxes, Flush-Device Boxes, and Covers |
| UL Standard 1242 | Electrical Intermediate Metal Conduit Steel |
| UL Standard 651 | Schedule 40, 80, Type EB and A Rigid PVC Conduit and Fittings |
| UL Standard 651A | Type EB and A Rigid PVC Conduit and HDPE Conduit |

END OF ITEM L-110

M-104

TRAFFIC DRUMS

DESCRIPTION

104-1.1 Traffic drums shall be furnished by the Contractor and placed and maintained as shown on the plans or as ordered by the Engineer. The traffic drums shall be installed on all closed segments of pavement or when ordered by the Engineer. The traffic drums shall remain in-place and clearly visible while the pavement is closed to traffic. The contractor shall make a frequent inspection of the marking and make prompt repairs, as necessary.

METHOD OF MEASUREMENT

104-2.1 Traffic drums shall be measured by unit. No separate measurement will be made for relocation of the traffic drums.

BASIS OF PAYMENT

104-3.1 The accepted quantity of traffic drums will be paid for at the contract unit price per each. The price shall be full compensation for furnishing all materials, labor and incidentals necessary to install, inspect and maintain and relocate each drum for the duration of the project.

Payment will be made under:

Item M-104-3.1	Traffic drum - per each
----------------	-------------------------

END OF SECTION M-104

ITEM M-107

LOW PROFILE AVIATION BARRICADES

DESCRIPTION

107-1.1 Aviation barricades shall be furnished by the Contractor and placed and maintained as shown on the plans or as ordered by the Engineer. The aviation barricades shall be installed when ordered by the Engineer. The aviation barricades shall remain in-place, clearly visible, until ordered removed by the Engineer. Continuous-burning red lights shall be placed on the barricades for nighttime use.

MATERIALS

107-2.1 Materials shall be in accordance with the Manual on Uniform Traffic Control Devices and with the VDOT, Road and Bridge Specifications, Section 512.

METHOD OF MEASUREMENT

107-3.1 Aviation barricades shall be measured per linear foot. No separate measurement will be made for relocation of the aviation barricades.

BASIS OF PAYMENT

107-4.1 The accepted quantity of aviation barricades will be paid for at the contract unit price per linear foot. The price shall be full compensation for furnishing all materials, labor and incidentals necessary to install, inspect and maintain the barricades for the duration of the project.

Payment will be made under:

Item M-107-4.1 Low Profile Aviation Barricades - per linear foot.

END OF SECTION M-107

Item P-152 Excavation, Subgrade, and Embankment

DESCRIPTION

152-1.1 This item covers excavation, disposal, placement, and compaction of all materials within the limits of the work required to construct safety areas, runways, taxiways, aprons, and intermediate areas as well as other areas for drainage, building construction, parking, or other purposes in accordance with these specifications and in conformity to the dimensions and typical sections shown on the plans.

152-1.2 Classification. All material excavated shall be classified as defined below:

- a. Unclassified excavation.** Unclassified excavation shall consist of the excavation and disposal of all material, regardless of its nature which is not otherwise classified and paid for under one of the following items.
- b. Rock excavation.** Rock excavation shall include all solid rock in ledges, in bedded deposits, in unstratified masses, and conglomerate deposits which are so firmly cemented they cannot be removed without blasting or using rippers. All boulders containing a volume of more than 1/2 cubic yard (0.4 m³) will be classified as “rock excavation.”

152-1.3 Unsuitable excavation. Unsuitable material shall be disposed off-site in a properly permitted location to be determined by the Contractor. Materials containing vegetable or organic matter, such as muck, peat, organic silt, or sod shall be considered unsuitable for use in embankment construction. Material suitable for topsoil may be used on the embankment slope when approved by the RPR.

CONSTRUCTION METHODS

152-2.1 General. Before beginning excavation, grading, and embankment operations in any area, the area shall be cleared or cleared and grubbed in accordance with Item P-151.

The suitability of material to be placed in embankments shall be subject to approval by the RPR. All unsuitable material shall be disposed off-site in a properly permitted location to be determined by the Contractor. All waste areas shall be graded to allow positive drainage of the area and adjacent areas. The surface elevation of waste areas shall be specified on the plans or approved by the RPR.

When the Contractor’s excavating operations encounter artifacts of historical or archaeological significance, the operations shall be temporarily discontinued and the RPR notified. At the direction of the RPR, the Contractor shall excavate the site in such a manner as to preserve the artifacts encountered and allow for their removal. Such excavation will be paid for as extra work.

Areas outside the limits of the pavement areas where the top layer of soil has become compacted by hauling or other Contractor activities shall be scarified and disked to a depth of 4 inches (100 mm), to loosen and pulverize the soil. Stones or rock fragments larger than 4 inches (100 mm) in their greatest dimension will not be permitted in the top 6 inches (150 mm) of the subgrade.

If it is necessary to interrupt existing surface drainage, sewers or under-drainage, conduits, utilities, or similar underground structures, the Contractor shall be responsible for and shall take all necessary precautions to preserve them or provide temporary services. When such facilities are encountered, the Contractor shall notify the RPR, who shall arrange for their removal if necessary. The Contractor, at their own expense, shall satisfactorily repair or pay the cost of all damage to such facilities or structures that may result from any of the Contractor’s operations during the period of the contract.

- a. Blasting.** Blasting will be permitted as directed by the RPR and in accordance with the following:

Blasting will be permitted only when proper precautions are taken for the safety of all persons, work, and property. All damage done to the work or property shall be repaired by the Contractor. The cost of repair is incidental to this item. All operations of the Contractor in connection with the transportation, storage, and use of explosives shall conform to all federal, state and local regulations and explosive manufacturers' instructions, with applicable approved permits reviewed by the RPR. Any approval will not relieve the Contractor of their responsibility in blasting operations.

Where blasting is approved, the Contractor shall employ a vibration consultant, approved by the RPR, to advise on explosive charge weights per delay and to analyze records from seismograph recordings. The seismograph shall be capable of producing a permanent record of the three components of the motion in terms of particle velocity, and in addition shall be capable of internal dynamic calibration.

In each distinct blasting area, where pertinent factors affecting blast vibrations and their effects in the area remain the same, the Contractor shall submit a blasting plan of the initial blasts to the RPR for approval. This plan must consist of hole size, depth, spacing, burden, type of explosives, type of delay sequence, maximum amount of explosive on any one delay period, depth of rock, and depth of overburden if any. The maximum explosive charge weights per delay included in the plan shall not be increased without the approval of the RPR.

The Contractor shall keep a record of each blast: its date, time and location; the amount of explosives used, maximum explosive charge weight per delay period, and, where necessary, seismograph records identified by instrument number and location.

Blasting and explosive storage shall be in accordance with the General Conditions and all federal, state, and local safety regulations.

These records shall be made available to the RPR on a monthly basis or in tabulated form at other times as required.

152-2.2 Excavation. No excavation shall be started until the work has been staked out by the Contractor and the RPR has obtained from the Contractor, the survey notes of the elevations and measurements of the ground surface. The Contractor and RPR shall agree that the original ground lines shown on the original topographic mapping are accurate or agree to any adjustments made to the original ground lines.

Digital terrain model (DTM) files of the existing surfaces, finished surfaces, and other various surfaces were used to develop the design plans.

Volumetric quantities were calculated by comparing DTM files of the applicable design surfaces and generating Triangle Volume Reports. Electronic copies of DTM files and a paper copy of the original topographic map will be issued to the successful bidder.

Existing grades on the design cross sections or DTM's, where they do not match the locations of actual spot elevations shown on the topographic map, were developed by computer interpolation from those spot elevations. Prior to disturbing original grade, Contractor shall verify the accuracy of the existing ground surface by verifying spot elevations at the same locations where original field survey data was obtained as indicated on the topographic map. Contractor shall recognize that, due to the interpolation process, the actual ground surface at any particular location may differ somewhat from the interpolated surface shown on the design cross sections or obtained from the DTM's. Contractor's verification of original ground surface, however, shall be limited to verification of spot elevations as indicated herein, and no adjustments will be made to the original ground surface unless the Contractor demonstrates that spot elevations shown are incorrect. For this purpose, spot elevations which are within 0.1 foot (30 mm) of the stated elevations for ground surfaces, or within 0.04 foot (12 mm) for hard surfaces (pavements, buildings, foundations, structures, etc.) shall be considered "no change". Only deviations in excess of these will be considered for adjustment of the original ground surface. If Contractor's verification identifies discrepancies in the topographic map, Contractor shall notify the RPR in writing at least two weeks before disturbance of

existing grade to allow sufficient time to verify the submitted information and make adjustments to the design cross sections or DTM's. Disturbance of existing grade in any area shall constitute acceptance by the Contractor of the accuracy of the original elevations shown on the topographic map for that area.

All areas to be excavated shall be stripped of vegetation and topsoil. Topsoil shall be stockpiled for future use in areas designated on the plans or by the RPR. All suitable excavated material shall be used in the formation of embankment, subgrade, or other purposes as shown on the plans. All unsuitable material shall be disposed of as shown on the plans.

The grade shall be maintained so that the surface is well drained at all times.

When the volume of the excavation exceeds that required to construct the embankments to the grades as indicated on the plans, the excess shall be used to grade the areas of ultimate development or disposed as directed by the RPR. When the volume of excavation is not sufficient for constructing the embankments to the grades indicated, the deficiency shall be obtained from borrow areas.

a. Selective grading. When selective grading is indicated on the plans, the more suitable material designated by the RPR shall be used in constructing the embankment or in capping the pavement subgrade. If, at the time of excavation, it is not possible to place this material in its final location, it shall be stockpiled in approved areas until it can be placed. The more suitable material shall then be placed and compacted as specified. Selective grading shall be considered incidental to the work involved. The cost of stockpiling and placing the material shall be included in the various pay items of work involved.

b. Undercutting. Rock, shale, hardpan, loose rock, boulders, or other material unsatisfactory for safety areas, subgrades, roads, shoulders, or any areas intended for turf shall be excavated to a minimum depth of 12 inches (300 mm) below the subgrade or to the depth specified by the RPR. Muck, peat, matted roots, or other yielding material, unsatisfactory for subgrade foundation, shall be removed to the depth specified. Unsuitable materials shall be disposed of off the airport. The cost is incidental to this item. This excavated material shall be paid for at the contract unit price per cubic yard (per cubic meter) for unclassified excavation. The excavated area shall be backfilled with suitable material obtained from the grading operations or borrow areas and compacted to specified densities. The necessary backfill will constitute a part of the embankment. Where rock cuts are made, backfill with select material. Any pockets created in the rock surface shall be drained in accordance with the details shown on the plans. Undercutting will be paid as unclassified excavation.

c. Over-break. Over-break, including slides, is that portion of any material displaced or loosened beyond the finished work as planned or authorized by the RPR. All over-break shall be graded or removed by the Contractor and disposed of as directed by the RPR. The RPR shall determine if the displacement of such material was unavoidable and their own decision shall be final. Payment will not be made for the removal and disposal of over-break that the RPR determines as avoidable. Unavoidable over-break will be classified as "Unclassified Excavation."

d. Removal of utilities. The removal of existing structures and utilities required to permit the orderly progress of work will be accomplished by the Contractor as indicated on the plans. All existing foundations shall be excavated at least 2 feet (60 cm) below the top of subgrade or as indicated on the plans, and the material disposed of as directed by the RPR. All foundations thus excavated shall be backfilled with suitable material and compacted as specified for embankment or as shown on the plans.

152-2.3 Borrow excavation. There are no borrow sources within the boundaries of the airport property. The Contractor shall locate and obtain borrow sources, subject to the approval of the RPR. The Contractor shall notify the RPR at least 15 days prior to beginning the excavation so necessary measurements and tests can be made by the RPR. All borrow pits shall be opened to expose the various strata of acceptable material to allow obtaining a uniform product. Borrow areas shall be drained and left in a neat, presentable condition with all slopes dressed uniformly. Borrow areas shall not create a hazardous wildlife attractant.

152-2.4 Drainage excavation. Drainage excavation shall consist of excavating drainage ditches including intercepting, inlet, or outlet ditches; or other types as shown on the plans. The work shall be performed in sequence with the other construction. Ditches shall be constructed prior to starting adjacent excavation operations. All satisfactory material shall be placed in embankment fills; unsuitable material shall be placed in designated waste areas or as directed by the RPR. All necessary work shall be performed true to final line, elevation, and cross-section. The Contractor shall maintain ditches constructed on the project to the required cross-section and shall keep them free of debris or obstructions until the project is accepted.

152-2.5 Preparation of cut areas or areas where existing pavement has been removed. In those areas on which a subbase or base course is to be placed, the top 12 inches (300 mm) of subgrade shall be compacted to not less than 100 % of maximum density for non-cohesive soils, and 95% of maximum density for cohesive soils as determined by ASTM D1557. As used in this specification, "non-cohesive" shall mean those soils having a plasticity index (PI) of less than 3 as determined by ASTM D4318.

152-2.6 Preparation of embankment area. All sod and vegetative matter shall be removed from the surface upon which the embankment is to be placed. The cleared surface shall be broken up by plowing or scarifying to a minimum depth of 6 inches (150 mm) and shall then be compacted per paragraph 152-2.10.

Sloped surfaces steeper than one (1) vertical to four (4) horizontal shall be plowed, stepped, benched, or broken up so that the fill material will bond with the existing material. When the subgrade is part fill and part excavation or natural ground, the excavated or natural ground portion shall be scarified to a depth of 12 inches (300 mm) and compacted as specified for the adjacent fill.

No direct payment shall be made for the work performed under this section. The necessary clearing and grubbing and the quantity of excavation removed will be paid for under the respective items of work.

152-2.7 Control Strip. The first half-day of construction of subgrade and/or embankment shall be considered as a control strip for the Contractor to demonstrate, in the presence of the RPR, that the materials, equipment, and construction processes meet the requirements of this specification. The sequence and manner of rolling necessary to obtain specified density requirements shall be determined. The maximum compacted thickness may be increased to a maximum of 12 inches (300 mm) upon the Contractor's demonstration that approved equipment and operations will uniformly compact the lift to the specified density. The RPR must witness this demonstration and approve the lift thickness prior to full production.

Control strips that do not meet specification requirements shall be reworked, re-compacted, or removed and replaced at the Contractor's expense. Full operations shall not begin until the control strip has been accepted by the RPR. The Contractor shall use the same equipment, materials, and construction methods for the remainder of construction, unless adjustments made by the Contractor are approved in advance by the RPR.

152-2.8 Formation of embankments. The material shall be constructed in lifts as established in the control strip, but not less than 6 inches (150 mm) nor more than 12 inches (300 mm) of compacted thickness.

When more than one lift is required to establish the layer thickness shown on the plans, the construction procedure described here shall apply to each lift. No lift shall be covered by subsequent lifts until tests verify that compaction requirements have been met. The Contractor shall rework, re-compact and retest any material placed which does not meet the specifications.

The lifts shall be placed, to produce a soil structure as shown on the typical cross-section or as directed by the RPR. Materials such as brush, hedge, roots, stumps, grass and other organic matter, shall not be incorporated or buried in the embankment.

Earthwork operations shall be suspended at any time when satisfactory results cannot be obtained due to rain, freezing, or other unsatisfactory weather conditions in the field. Frozen material shall not be placed in the embankment nor shall embankment be placed upon frozen material. Material shall not be placed on surfaces that are muddy, frozen, or contain frost. The Contractor shall drag, blade, or slope the embankment to provide surface drainage at all times.

The material in each lift shall be within $\pm 2\%$ of optimum moisture content before rolling to obtain the prescribed compaction. The material shall be moistened or aerated as necessary to achieve a uniform moisture content throughout the lift. Natural drying may be accelerated by blending in dry material or manipulation alone to increase the rate of evaporation.

The Contractor shall make the necessary corrections and adjustments in methods, materials or moisture content to achieve the specified embankment density.

The Contractor will take samples of excavated materials which will be used in embankment for testing and develop a Moisture-Density Relations of Soils Report (Proctor) in accordance with ASTM D698. A new Proctor shall be developed for each soil type based on visual classification.

Density tests will be taken by the RPR for every 3,000 square yards of compacted embankment for each lift which is required to be compacted, or other appropriate frequencies as determined by the RPR.

If the material has greater than 30% retained on the 3/4-inch (19.0 mm) sieve, follow AASHTO T-180 Annex Correction of maximum dry density and optimum moisture for oversized particles.

Rolling operations shall be continued until the embankment is compacted to not less than 100% of maximum density for non-cohesive soils, and 95% of maximum density for cohesive soils as determined by ASTM D1557. Under all areas to be paved, the embankments shall be compacted to a depth of 12 inches and to a density of not less than 100 percent of the maximum density as determined by ASTM D1557. As used in this specification, "non-cohesive" shall mean those soils having a plasticity index (PI) of less than 3 as determined by ASTM D4318.

On all areas outside of the pavement areas, no compaction will be required on the top 4 inches (100 mm) which shall be prepared for a seedbed in accordance with Item T-901.

The in-place field density shall be determined in accordance with ASTM D1557. Contractor's laboratory shall perform all density tests in the RPR's presence and provide the test results upon completion to the RPR for acceptance. If the specified density is not attained, the area represented by the test or as designated by the RPR shall be reworked and/or re-compacted and additional random tests made. This procedure shall be followed until the specified density is reached.

Compaction areas shall be kept separate, and no lift shall be covered by another lift until the proper density is obtained.

During construction of the embankment, the Contractor shall route all construction equipment evenly over the entire width of the embankment as each lift is placed. Lift placement shall begin in the deepest portion of the embankment fill. As placement progresses, the lifts shall be constructed approximately parallel to the finished pavement grade line.

When rock, concrete pavement, asphalt pavement, and other embankment material are excavated at approximately the same time as the subgrade, the material shall be incorporated into the outer portion of the embankment and the subgrade material shall be incorporated under the future paved areas. Stones, fragmentary rock, and recycled pavement larger than 4 inches (100 mm) in their greatest dimensions will not be allowed in the top 12 inches (300 mm) of the subgrade. Rockfill shall be brought up in lifts as specified or as directed by the RPR and the finer material shall be used to fill the voids forming a dense, compact mass. Rock, cement concrete pavement, asphalt pavement, and other embankment material shall not be disposed of except at places and in the manner designated on the plans or by the RPR.

When the excavated material consists predominantly of rock fragments of such size that the material cannot be placed in lifts of the prescribed thickness without crushing, pulverizing or further breaking down the pieces, such material may be placed in the embankment as directed in lifts not exceeding 2 feet (60 cm) in thickness. Each lift shall be leveled and smoothed with suitable equipment by distribution of spalls and finer fragments of rock. The lift shall not be constructed above an elevation 4 feet (1.2 m) below the finished subgrade.

There will be no separate measurement of payment for compacted embankment. All costs incidental to placing in lifts, compacting, discing, watering, mixing, sloping, and other operations necessary for construction of embankments will be included in the contract price for excavation, borrow, or other items.

152-2.9 Proof rolling. The purpose of proof rolling the subgrade is to identify any weak areas in the subgrade and not for compaction of the subgrade. Before start of embankment, the subgrade area shall be proof rolled with a 20 ton (18.1 metric ton) Tandem axle Dual Wheel Dump Truck loaded to the legal limit with tires inflated to 100 psi (0.689 MPa) in the presence of the RPR. Apply a minimum of 1 coverage, or as specified by the RPR, under pavement areas. A coverage is defined as the application of one tire print over the designated area. Soft areas of subgrade that deflect more than 1 inch (25 mm) or show permanent deformation greater than 1 inch (25 mm) shall be removed and replaced with suitable material or reworked to conform to the moisture content and compaction requirements in accordance with these specifications. Removal and replacement of soft areas is incidental to this item.

152-2.10 Compaction requirements. The subgrade under areas to be paved shall be compacted to a depth of 12 inches (300 mm) and to a density of not less than 100 percent of the maximum dry density as determined by ASTM D1557. The subgrade in areas outside the limits of the pavement areas shall be compacted to a depth of 12 inches (300 mm) and to a density of not less than 95 percent of the maximum density as determined by ASTM D698.

The material to be compacted shall be within $\pm 2\%$ of optimum moisture content before being rolled to obtain the prescribed compaction (except for expansive soils). When the material has greater than 30 percent retained on the $\frac{3}{4}$ inch (19.0 mm) sieve, follow the methods in ASTM D698. Tests for moisture content and compaction will be taken at a minimum of 2,000 S.Y. of subgrade. All quality assurance testing shall be done by completion to the RPR for acceptance determination.

The in-place field density shall be determined in accordance with ASTM D6938 using Procedure A, the direct transmission method, and ASTM D6938 shall be used to determine the moisture content of the material. The machine shall be calibrated in accordance with ASTM D6938 within 12 months prior to its use on this contract. The gage shall be field standardized daily.

Maximum density refers to maximum dry density at optimum moisture content unless otherwise specified.

If the specified density is not attained, the entire lot shall be reworked and/or re-compacted and additional random tests made. This procedure shall be followed until the specified density is reached.

All cut-and-fill slopes shall be uniformly dressed to the slope, cross-section, and alignment shown on the plans or as directed by the RPR and the finished subgrade shall be maintained.

152-2.11 Finishing and protection of subgrade. Finishing and protection of the subgrade is incidental to this item. Grading and compacting of the subgrade shall be performed so that it will drain readily. All low areas, holes or depressions in the subgrade shall be brought to grade. Scarifying, blading, rolling and other methods shall be performed to provide a thoroughly compacted subgrade shaped to the lines and grades shown on the plans. All ruts or rough places that develop in the completed subgrade shall be graded, re-compacted, and retested. The Contractor shall protect the subgrade from damage and limit hauling over the finished subgrade to only traffic essential for construction purposes.

The Contractor shall maintain the completed course in satisfactory condition throughout placement of subsequent layers. No subbase, base, or surface course shall be placed on the subgrade until the subgrade has been accepted by the RPR.

152-2.12 Haul. All hauling will be considered a necessary and incidental part of the work. The Contractor shall include the cost in the contract unit price for the pay of items of work involved. No payment will be made separately or directly for hauling on any part of the work.

The Contractor's equipment shall not cause damage to any excavated surface, compacted lift or to the subgrade as a result of hauling operations. Any damage caused as a result of the Contractor's hauling operations shall be repaired at the Contractor's expense.

The Contractor shall be responsible for providing, maintaining and removing any haul roads or routes within or outside of the work area, and shall return the affected areas to their former condition, unless otherwise authorized in writing by the Owner. No separate payment will be made for any work or materials associated with providing, maintaining and removing haul roads or routes.

152-2.13 Surface Tolerances. In those areas on which a subbase or base course is to be placed, the surface shall be tested for smoothness and accuracy of grade and crown. Any portion lacking the required smoothness or failing in accuracy of grade or crown shall be scarified to a depth of at least 3 inches (75 mm), reshaped and re-compacted to grade until the required smoothness and accuracy are obtained and approved by the RPR. The Contractor shall perform all final smoothness and grade checks in the presence of the RPR. Any deviation in surface tolerances shall be corrected by the Contractor at the Contractor's expense.

- a. **Smoothness.** The finished surface shall not vary more than +/- ½ inch (12 mm) when tested with a 12-foot (3.7-m) straightedge applied parallel with and at right angles to the centerline. The straightedge shall be moved continuously forward at half the length of the 12-foot (3.7-m) straightedge for the full length of each line on a 50-foot (15-m) grid.
- b. **Grade.** The grade and crown shall be measured on a 50-foot (15-m) grid and shall be within +/- 0.05 feet (15 mm) of the specified grade.

On safety areas, turfed areas and other designated areas within the grading limits where no subbase or base is to be placed, grade shall not vary more than 0.10 feet (30 mm) from specified grade. Any deviation in excess of this amount shall be corrected by loosening, adding or removing materials, and reshaping.

152-2.14 Topsoil. When topsoil is specified or required as shown on the plans or under Item T-905, it shall be salvaged from stripping or other grading operations. The topsoil shall meet the requirements of Item T-905. If, at the time of excavation or stripping, the topsoil cannot be placed in its final section of finished construction, the material shall be stockpiled at approved locations. Stockpiles shall be located as shown on the plans and the approved CSPP and shall not be placed on areas that subsequently will require any excavation or embankment fill. If, in the judgment of the RPR, it is practical to place the salvaged topsoil at the time of excavation or stripping, the material shall be placed in its final position without stockpiling or further re-handling.

Upon completion of grading operations, stockpiled topsoil shall be handled and placed as shown on the plans and as required in Item T-905. Topsoil shall be paid for as provided in Item T-905. No direct payment will be made for topsoil under Item P-152.

METHOD OF MEASUREMENT

152-3.1 Measurement for payment specified by the cubic yard (cubic meter) shall be computed by the comparison of digital terrain model (DTM) surfaces] for computation of neat line design quantities. The end area is that bound by the original ground line established by field cross-sections and the final theoretical pay line established by cross-sections shown on the plans, subject to verification by the RPR.

152-3.1 The quantity of unclassified, rock and borrow excavation to be paid for shall be the number of cubic yards (cubic meters) measured in its original position. Measurement shall not include the quantity of materials excavated without authorization beyond normal slope lines, or the quantity of material used for purposes other than those directed.

BASIS OF PAYMENT

152-4.1 Unclassified excavation, Rock Excavation, and Borrow Excavation payment shall be made at the contract unit price per cubic yard (cubic meter). This price shall be full compensation for furnishing all materials, labor, equipment, tools, and incidentals necessary to complete the item.

Item P-152-4.1	Unclassified Excavation – per cubic yard (cubic meter)
Item P-152-4.2	Rock Excavation – per cubic yard (cubic meter)
Item P-152-4.1	Unsuitable Excavation – per cubic yard (cubic meter)

REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

American Association of State Highway and Transportation Officials (AASHTO)

AASHTO T-180	Standard Method of Test for Moisture-Density Relations of Soils Using a 4.54-kg (10-lb) Rammer and a 457-mm (18-in.) Drop
--------------	---

ASTM International (ASTM)

ASTM D698	Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft ³ (600 kN-m/m ³))
ASTM D1556	Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method
ASTM D1557	Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft ³ (2700 kN-m/m ³))
ASTM D6938	Standard Test Methods for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)

Advisory Circulars (AC)

AC 150/5370-2	Operational Safety on Airports During Construction Software
---------------	---

Software

FAARFIELD	– FAA Rigid and Flexible Iterative Elastic Layered Design
-----------	---

U.S. Department of Transportation

FAA RD-76-66	Design and Construction of Airport Pavements on Expansive Soils
--------------	---

END OF ITEM P-152

Item P-209

Crushed Aggregate Base Course

DESCRIPTION

209-1.1 This item consists of a base course composed of crushed aggregate base constructed on a prepared course in accordance with these specifications and in conformity to the dimensions and typical cross-sections shown on the plans.

MATERIALS

209-2.1 Crushed aggregate base. Crushed aggregate shall consist of clean, sound, durable particles of crushed stone or crushed gravel and shall be free from coatings of clay, silt, organic material, clay lumps or balls or other deleterious materials or coatings. The method used to produce the crushed gravel shall result in the fractured particles in the finished product as consistent and uniform as practicable. Fine aggregate portion, defined as the portion passing the No. 4 (4.75 mm) sieve shall consist of fines from the coarse aggregate crushing operation. The fine aggregate shall be produced by crushing stone, or gravel that meet the coarse aggregate requirements for wear and soundness. Aggregate base material requirements are listed in the following table.

Crushed Aggregate Base Material Requirements

Material Test	Requirement	Standard
Coarse Aggregate		
Resistance to Degradation	Loss: 45% maximum	ASTM C131
Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate	Loss after 5 cycles: 12% maximum using Sodium sulfate - or - 18% maximum using magnesium sulfate	ASTM C88
Percentage of Fractured Particles	Minimum 90% by weight of particles with at least two fractured faces and 100% with at least one fractured face ¹	ASTM D5821
Flat Particles, Elongated Particles, or Flat and Elongated Particles	10% maximum, by weight, of flat, elongated, or flat and elongated particles ²	ASTM D4791
Clay lumps and friable particles	Less than or equal to 3 percent	ASTM C142
Fine Aggregate		
Liquid limit	Less than or equal to 25	ASTM D4318
Plasticity Index	Not more than five (5)	ASTM D4318

¹ The area of each face shall be equal to at least 75% of the smallest mid-sectional area of the piece. When two fractured faces are contiguous, the angle between the planes of fractures shall be at least 30 degrees to count as two fractured faces.

² A flat particle is one having a ratio of width to thickness greater than five (5); an elongated particle is one having a ratio of length to width greater than five (5).

209-2.2 Gradation requirements. The gradation of the aggregate base material shall meet the requirements of the gradation given in the following table when tested per ASTM C117 and ASTM C136. The gradation shall be well graded from coarse to fine and shall not vary from the lower limit on one sieve to the high limit on an adjacent sieve or vice versa.

Gradation of Aggregate Base

Sieve Size	Design Range Percentage by Weight passing	Contractor's Final Gradation	Job Control Grading Band Tolerances ¹ (Percent)
2 inch (50 mm)	100		0
1-1/2 inch (37.5 mm)	95-100		±5
1 inch (25.0 mm)	70-95		±8
3/4 inch (19.0 mm)	55-85		±8
No. 4 (4.75 mm)	30-60		±8
No. 40 ² (425 µm)	10-30		±5
No. 200 ² (75 µm)	0-5		±3

¹ The “Job Control Grading Band Tolerances for Contractor’s Final Gradation” in the table shall be applied to “Contractor’s Final Gradation” to establish a job control grading band. The full tolerance still applies if application of the tolerances results in a job control grading band outside the design range.

² The fraction of material passing the No 200 (75 µm) sieve shall not exceed two-thirds the fraction passing the No 40 (425 µm) sieve.

209-2.3 Sampling and Testing.

a. Aggregate base materials. The Contractor shall take samples of the aggregate base in accordance with ASTM D75 to verify initial aggregate base requirements and gradation. Material shall meet the requirements in paragraph 209-2.1. This sampling and testing will be the basis for approval of the aggregate base quality requirements.

b. Gradation requirements. The Contractor shall take at least two aggregate base samples per day in the presence of the Resident Project Representative (RPR) to check the final gradation. Sampling shall be per ASTM D75. Material shall meet the requirements in paragraph 209-2.2. The samples shall be taken from the in-place, un-compacted material at sampling points and intervals designated by the RPR.

209-2.4 Separation Geotextile. Separation geotextile shall be Class 2, 0.02 sec⁻¹ permittivity per ASTM D4491, Apparent opening size per ASTM D4751 with 0.60 mm maximum average roll value.

CONSTRUCTION METHODS

209-3.1 Control strip. The first half-day of construction shall be considered the control strip. The Contractor shall demonstrate, in the presence of the RPR, that the materials, equipment, and construction processes meet the requirements of the specification. The sequence and manner of rolling necessary to obtain specified density requirements shall be determined. The maximum compacted thickness may be increased to a maximum of 12 inches (300 mm) upon the Contractor's demonstration that approved equipment and operations will uniformly compact the lift to the specified density. The RPR must witness this demonstration and approve the lift thickness prior to full production.

Control strips that do not meet specification requirements shall be reworked, re-compacted or removed and replaced at the Contractor's expense. Full operations shall not continue until the control strip has been accepted by the RPR. The Contractor shall use the same equipment, materials, and construction methods for the remainder of construction, unless adjustments made by the Contractor are approved by the RPR.

209-3.2 Preparing underlying subgrade and/or subbase. The underlying subgrade and/or subbase shall be checked and accepted by the RPR before base course placing and spreading operations begin. Re-proof rolling of the subgrade or proof rolling of the subbase in accordance with Item P-152, at the Contractor's expense, may be required by the RPR if the Contractor fails to ensure proper drainage or protect the subgrade and/or subbase. Any ruts or soft, yielding areas due to improper drainage conditions, hauling, or any other cause, shall be corrected before the base course is placed. To ensure proper drainage, the spreading of the base shall begin along the centerline of the pavement on a crowned section or on the high side of the pavement with a one-way slope.

209-3.3 Production. The aggregate shall be uniformly blended and, when at a satisfactory moisture content per paragraph 209-3.5, the approved material may be transported directly to the placement.

209-3.4 Placement. The aggregate shall be placed and spread on the prepared underlying layer by spreader boxes or other devices as approved by the RPR, to a uniform thickness and width. The equipment shall have positive thickness controls to minimize the need for additional manipulation of the material. Dumping from vehicles that require re-handling shall not be permitted. Hauling over the uncompacted base course shall not be permitted.

The aggregate shall meet gradation and moisture requirements prior to compaction. The base course shall be constructed in lifts as established in the control strip, but not less than 4 inches (100 mm) nor more than 12 inches (300 mm) of compacted thickness.

When more than one lift is required to establish the layer thickness shown on the plans, the construction procedure described here shall apply to each lift. No lift shall be covered by subsequent lifts until tests verify that compaction requirements have been met. The Contractor shall rework, re-compact and retest any material placed which does not meet the specifications at the Contractor's expense.

209-3.5 Compaction. Immediately after completion of the spreading operations, compact each layer of the base course, as specified, with approved compaction equipment. The number, type, and weight of rollers shall be sufficient to compact the material to the required density within the same day that the aggregate is placed on the subgrade.

The field density of each compacted lift of material shall be at least 100% of the maximum density of laboratory specimens prepared from samples of the subbase material delivered to the jobsite. The laboratory specimens shall be compacted and tested in accordance with ASTM D1557. The moisture content of the material during placing operations shall be within ± 2 percentage points of

the optimum moisture content as determined by ASTM D1557. Maximum density refers to maximum dry density at optimum moisture content unless otherwise specified.

209-3.6 Weather limitations. Material shall not be placed unless the ambient air temperature is at least 40°F (4°C) and rising. Work on base course shall not be conducted when the subgrade or subbase is wet or frozen or the base material contains frozen material.

209-3.7 Maintenance. The base course shall be maintained in a condition that will meet all specification requirements. When material has been exposed to excessive rain, snow, or freeze-thaw conditions, prior to placement of additional material, the Contractor shall verify that materials still meet all specification requirements. Equipment may be routed over completed sections of base course, provided that no damage results and the equipment is routed over the full width of the completed base course. Any damage resulting to the base course from routing equipment over the base course shall be repaired by the Contractor at the Contractor's expense.

209-3.8 Surface tolerances. After the course has been compacted, the surface shall be tested for smoothness and accuracy of grade and crown. Any portion lacking the required smoothness or failing in accuracy of grade or crown shall be scarified to a depth of at least 3 inches (75 mm), reshaped and recompact to grade until the required smoothness and accuracy are obtained and approved by the RPR. Any deviation in surface tolerances shall be corrected by the Contractor at the Contractor's expense. The smoothness and accuracy requirements specified here apply only to the top layer when base course is constructed in more than one layer.

a. Smoothness. The finished surface shall not vary more than 3/8-inch (9 mm) when tested with a 12-foot (3.7-m) straightedge applied parallel with and at right angles to the centerline. The straightedge shall be moved continuously forward at half the length of the 12-foot (3.7-m) straightedge for the full length of each line on a 50-foot (15-m) grid.

b. Grade. The grade and crown shall be measured on a 50-foot (15-m) grid and shall be within +0 and -1/2 inch (12 mm) of the specified grade.

209-3.9 Acceptance sampling and testing. Crushed aggregate base course shall be accepted for density and thickness on an area basis. Two tests shall be made for density and thickness for each 1200 square yds (1000 m²). Sampling locations will be determined on a random basis per ASTM D3665

a. Density. The Contractor's laboratory shall perform all density tests in the RPR's presence and provide the test results upon completion to the RPR for acceptance.

Each area shall be accepted for density when the field density is at least 100% of the maximum density of laboratory specimens compacted and tested per ASTM D1557. The in-place field density shall be determined per ASTM D6938 using Procedure A, the direct transmission method, and ASTM D6938 shall be used to determine the moisture content of the material. The machine shall be calibrated in accordance with ASTM D6938. If the specified density is not attained, the area represented by the failed test must be reworked and/or recompact and two additional random tests made. This procedure shall be followed until the specified density is reached. Maximum density refers to maximum dry density at optimum moisture content unless otherwise specified.

b. Thickness. Depth tests shall be made by test holes at least 3 inches (75 mm) in diameter that extend through the base. The thickness of the base course shall be within +0 and -1/2 inch (12 mm) of the specified thickness as determined by depth tests taken by the Contractor in the presence of the RPR for each area. Where the thickness is deficient by more than 1/2-inch (12 mm), the Contractor shall correct such areas at no additional cost by scarifying to a depth of at least 3 inches (75 mm), adding new material of proper gradation, and the material shall be blended and

recompacted to grade. The Contractor shall replace, at his expense, base material where depth tests have been taken.

METHOD OF MEASUREMENT

209-4.1 The quantity of crushed aggregate base course will be determined by measurement of the number of square yards (square meters) of material actually constructed and accepted by the RPR as complying with the plans and specifications. Base materials shall not be included in any other excavation quantities.

209-4.2 Separation geotextile shall be measured by the number of square yards of materials placed and accepted by the RPR as complying with the plans and specifications excluding seam overlaps and edge anchoring.

BASIS OF PAYMENT

209-5.1 Payment shall be made at the contract unit price per square yard (square meter) for crushed aggregate base course. This price shall be full compensation for furnishing all materials, for preparing and placing these materials, and for all labor, equipment tools, and incidentals necessary to complete the item.

209-5.2 Payment shall be made at the contract unit price per square yard for separation geotextile. The price shall be full compensation for furnishing all labor, equipment, material, anchors, and incidentals necessary.

Payment will be made under:

Item P-209-5.1	Crushed Aggregate Base Course - per square yard (square meter)
Item P-209-5.2	Separation geotextile per square yard

REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

ASTM International (ASTM)

ASTM C29	Standard Test Method for Bulk Density (“Unit Weight”) and Voids in Aggregate
ASTM C88	Standard Test Method for Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate
ASTM C117	Standard Test Method for Materials Finer than 75- μ m (No. 200) Sieve in Mineral Aggregates by Washing
ASTM C131	Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine
ASTM C136	Standard Test Method for Sieve or Screen Analysis of Fine and Coarse Aggregates
ASTM C142	Standard Test Method for Clay Lumps and Friable Particles in Aggregates

ASTM D75	Standard Practice for Sampling Aggregates
ASTM D698	Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft ³ (600 kN-m/m ³))
ASTM D1556	Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method
ASTM D1557	Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft ³ (2700 kN-m/m ³))
ASTM D2167	Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method
ASTM D2419	Standard Test Method for Sand Equivalent Value of Soils and Fine Aggregate
ASTM D3665	Standard Practice for Random Sampling of Construction Materials
ASTM D4318	Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils
ASTM D4491	Standard Test Methods for Water Permeability of Geotextiles by Permittivity
ASTM D4643	Standard Test Method for Determination of Water Content of Soil and Rock by Microwave Oven Heating
ASTM D4751	Standard Test Methods for Determining Apparent Opening Size of a Geotextile
ASTM D4791	Standard Test Method for Flat Particles, Elongated Particles, or Flat and Elongated Particles in Coarse Aggregate
ASTM D5821	Standard Test Method for Determining the Percentage of Fractured Particles in Coarse Aggregate
ASTM D6938	Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)
ASTM D7928	Standard Test Method for Particle-Size Distribution (Gradation) of Fine-Grained Soils Using the Sedimentation (Hydrometer) Analysis

American Association of State Highway and Transportation Officials (AASHTO)

M288	Standard Specification for Geosynthetic Specification for Highway Applications
------	--

END OF ITEM P-209

Item P-602

Emulsified Asphalt Prime Coat

DESCRIPTION

602-1.1 This item shall consist of an application of emulsified asphalt material on the prepared base course in accordance with these specifications and in reasonably close conformity to the lines shown on the plans.

MATERIALS

602-2.1 Emulsified Asphalt material. The emulsified asphalt material shall be as specified in ASTM D3628 for use as a prime coat appropriate to local conditions. The Contractor shall provide a copy of the manufacturer's Certificate of Analysis (COA) for the emulsified asphalt material. The COA shall be provided to and approved by the Resident Project Representative (RPR) before the emulsified asphalt material is applied. The furnishing of the COA for the emulsified asphalt material shall not be interpreted as a basis for final acceptance. The manufacturer's COA may be subject to verification by testing the material delivered for use on the project.

CONSTRUCTION METHODS

602-3.1 Weather limitations. The emulsified asphalt prime coat shall be applied only when the existing surface is dry; the atmospheric temperature is 50°F (10°C) or above, and the temperature has not been below 35°F (2°C) for the 12 hours prior to application; and when the weather is not foggy or rainy. The temperature requirements may be waived when directed by the RPR.

602-3.2 Equipment. The equipment shall include a self-powered pressure asphalt material distributor and equipment for heating asphalt material.

Provide a distributor with pneumatic tires of such size and number that the load produced on the base surface does not exceed 65.0 psi (4.5 kg/sq cm) of tire width to prevent rutting, shoving or otherwise damaging the base, surface or other layers in the pavement structure. Design and equip the distributor to spray the asphalt material in a uniform coverage at the specified temperature, at readily determined and controlled rates from 0.05 to 1.0 gallons per square yard (0.23 to 4.5 L/square meter), with a pressure range of 25 to 75 psi (172.4 to 517.1 kPa) and with an allowable variation from the specified rate of not more than ±5%, and at variable widths. Include with the distributor equipment a separate power unit for the bitumen pump, full-circulation spray bars, tachometer, pressure gauges, volume-measuring devices, adequate heaters for heating of materials to the proper application temperature, a thermometer for reading the temperature of tank contents, and a hand hose attachment suitable for applying asphalt material manually to areas inaccessible to the distributor. Equip the distributor to circulate and agitate the asphalt material during the heating process. If the distributor is not equipped with an operable quick shutoff valve, the prime operations shall be started and stopped on building paper.

A power broom and power blower suitable for cleaning the surfaces to which the asphalt coat is to be applied shall be provided.

Asphalt distributors must be calibrated annually in accordance with ASTM D2995. The Contractor must furnish a current calibration certification for the asphalt distributor truck from any State or other agency as approved by the RPR.

602-3.3 Application of emulsified asphalt material. Immediately before applying the prime coat, the full width of the surface to be primed shall be swept with a power broom to remove all loose dirt and other objectionable material.

The asphalt emulsion material shall be uniformly applied with an asphalt distributor at the rate of 0.15 to 0.30 gallons per square yard (0.68 to 1.36 liters per square meter) depending on the base course surface texture. The type of asphalt material and application rate shall be approved by the RPR prior to application.

Following application of the emulsified asphalt material and prior to application of the succeeding layer of pavement, allow the asphalt coat to cure and to obtain evaporation of any volatiles or moisture. Maintain the coated surface until the succeeding layer of pavement is placed, by protecting the surface against damage and by repairing and recoating deficient areas. Allow the prime coat to cure without being disturbed for a period of at least 48 hours or longer, as may be necessary to attain penetration into the treated course. Furnish and spread sand to effectively blot up and cure excess asphalt material. The Contractor shall remove blotting sand prior to asphalt concrete lay down operations at no additional expense to the Owner. Keep traffic off surfaces freshly treated with asphalt material. Provide sufficient warning signs and barricades so that traffic will not travel over freshly treated surfaces.

602-3.4 Trial application rates. The Contractor shall apply a minimum of three lengths of at least 100 feet (30 m) for the full width of the distributor bar to evaluate the amount of emulsified asphalt material that can be satisfactorily applied with the equipment. Apply three different application rates of emulsified asphalt materials within the application range specified in paragraph 602-3.3. Other trial applications can be made using various amounts of material as directed by the RPR. The trial application is to demonstrate the equipment can uniformly apply the emulsified asphalt material within the rates specified and determine the application rate for the project.

602-3.5 Freight and waybills. The Contractor shall submit waybills and delivery tickets during the progress of the work. Before the final estimate is allowed, file with the RPR certified waybills and certified delivery tickets for all emulsified asphalt materials used in the construction of the pavement covered by the contract. Do not remove emulsified asphalt material from storage until the initial outage and temperature measurements have been taken. The delivery or storage units will not be released until the final outage has been taken.

METHOD OF MEASUREMENT

602-4.1 The emulsified asphalt material for prime coat shall be measured by the gallon (liter). Volume shall be corrected to the volume at 60°F (16°C) in accordance with ASTM D4311. The emulsified asphalt material paid for will be the measured quantities used in the accepted work, provided that the measured quantities are not 10% over the specified application rate. Any amount of emulsified asphalt material more than 10% over the specified application rate for each application will be deducted from the measured quantities, except for irregular areas where hand spraying of the emulsified asphalt material is necessary. Water added to emulsified asphalt will not be measured for payment.

BASIS OF PAYMENT

602-5.1 Payment shall be made at the contract unit price per gallon (liter) for emulsified asphalt prime coat. This price shall be full compensation for furnishing all materials and for all preparation, delivering, and applying the materials, and for all labor, equipment, tools, and incidentals necessary to complete this item.

Payment will be made under:

Item P-602-5.1 Emulsified Asphalt Prime Coat - per gallon (liter)

REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

ASTM International (ASTM)

ASTM D2995 Standard Practice for Estimating Application Rate and Residual
Application Rate of Bituminous Distributors

ASTM D3628 Standard Practice for Selection and Use of Emulsified Asphalts

END OF ITEM P-602

Item P-603

Bituminous Tack Coat

DESCRIPTION

DESCRIPTION

603-1.1 This item shall consist of preparing and treating an asphalt or concrete surface with asphalt material in accordance with these specifications and in reasonably close conformity to the lines shown on the plans.

MATERIALS

603-2.1 Asphalt materials. The asphalt material shall be an emulsified asphalt as specified in ASTM D3628 as an asphalt application for tack coat appropriate to local conditions. The emulsified asphalt shall not be diluted. The Contractor shall provide a copy of the manufacturer's Certificate of Analysis (COA) for the asphalt material to the Resident Project Representative (RPR) before the asphalt material is applied for review and acceptance. The furnishing of COA for the asphalt material shall not be interpreted as a basis for final acceptance. The manufacturer's COA may be subject to verification by testing the material delivered for use on the project.

CONSTRUCTION METHODS

603-3.1 Weather limitations. The tack coat shall be applied only when the existing surface is dry and the atmospheric temperature is 50°F (10°C) or above; the temperature has not been below 35°F (2°C) for the 12 hours prior to application; and when the weather is not foggy or rainy. The temperature requirements may be waived when directed by the RPR.

603-3.2 Equipment. The Contractor shall provide equipment for heating and applying the emulsified asphalt material. The emulsion shall be applied with a manufacturer-approved computer rate-controlled asphalt distributor. The equipment shall be in good working order and contain no contaminants or diluents in the tank. Spray bar tips must be clean, free of burrs, and of a size to maintain an even distribution of the emulsion. Any type of tip or pressure source is suitable that will maintain predetermined flow rates and constant pressure during the application process with application speeds under eight (8) miles per hour (13 km per hour) or seven (700) feet per minute (213 m per minute).

The equipment will be tested under pressure for leaks and to ensure proper set-up before use to verify truck set-up (via a test-shot area), including but not limited to, nozzle tip size appropriate for application, spray-bar height and pressure and pump speed, evidence of triple-overlap spray pattern, lack of leaks, and any other factors relevant to ensure the truck is in good working order before use.

The distributor truck shall be equipped with a minimum 12-foot (3.7-m) spreader spray bar with individual nozzle control with computer-controlled application rates. The distributor truck shall have an easily accessible thermometer that constantly monitors the temperature of the emulsion, and have an operable mechanical tank gauge that can be used to cross-check the computer accuracy. If the distributor is not equipped with an operable quick shutoff valve, the prime operations shall be started and stopped on building paper.

The distributor truck shall be equipped to effectively heat and mix the material to the required temperature prior to application as required. Heating and mixing shall be done in accordance with the manufacturer’s recommendations. Do not overheat or over mix the material.

The distributor shall be equipped with a hand sprayer.

Asphalt distributors must be calibrated annually in accordance with ASTM D2995. The Contractor must furnish a current calibration certification for the asphalt distributor truck from any State or other agency as approved by the RPR.

A power broom and/or power blower suitable for cleaning the surfaces to which the asphalt tack coat is to be applied shall be provided.

603-3.3 Application of emulsified asphalt material. The emulsified asphalt shall not be diluted. Immediately before applying the emulsified asphalt tack coat, the full width of surface to be treated shall be swept with a power broom and/or power blower to remove all loose dirt and other objectionable material.

The emulsified asphalt material shall be uniformly applied with an asphalt distributor at the rates appropriate for the conditions and surface specified in the table below. The type of asphalt material and application rate shall be approved by the RPR prior to application.

Emulsified Asphalt

Surface Type	Residual Rate, gal/SY (L/square meter)	Emulsion Application Bar Rate, gal/SY (L/square meter)
New asphalt	0.02-0.05 (0.09-0.23)	0.03-0.07 (0.13-0.32)
Existing asphalt	0.04-0.07 (0.18-0.32)	0.06-0.11 (0.27-0.50)
Milled Surface	0.04-0.08 (0.18-0.36)	.06-0.12 (0.27-0.54)
Concrete	0.03-0.05 (0.13-0.23)	0.05-0.08 (0.23-0.36)

After application of the tack coat, the surface shall be allowed to cure without being disturbed for the period of time necessary to permit drying and setting of the tack coat. This period shall be determined by the RPR. The Contractor shall protect the tack coat and maintain the surface until the next course has been placed. When the tack coat has been disturbed by the Contractor, tack coat shall be reapplied at the Contractor’s expense.

603-3.4 Freight and waybills The Contractor shall submit waybills and delivery tickets, during progress of the work. Before the final statement is allowed, file with the RPR certified waybills and certified delivery tickets for all emulsified asphalt materials used in the construction of the pavement covered by the contract. Do not remove emulsified asphalt material from storage until the initial outage and temperature measurements have been taken. The delivery or storage units will not be released until the final outage has been taken.

METHOD OF MEASUREMENT

603-4.1 The emulsified asphalt material for tack coat shall not be measured separately.

REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

ASTM International (ASTM)

ASTM D1250	Standard Guide for Use of the Petroleum Measurement Tables
ASTM D2995	Standard Practice for Estimating Application Rate and Residual Application Rate of Bituminous Distributors
ASTM D3628	Standard Practice for Selection and Use of Emulsified Asphalts

END ITEM P-603

Item P-610

Concrete for Miscellaneous Structures

DESCRIPTION

610-1.1 This item shall consist of concrete and reinforcement, as shown on the plans, prepared and constructed in accordance with these specifications. This specification shall be used for all concrete other than airfield pavement which are cast-in-place.

MATERIALS

610-2.1 General. Only approved materials, conforming to the requirements of these specifications, shall be used in the work. Materials may be subject to inspection and tests at any time during their preparation or use. The source of all materials shall be approved by the Resident Project Representative (RPR) before delivery or use in the work. Representative preliminary samples of the materials shall be submitted by the Contractor, when required, for examination and test. Materials shall be stored and handled to ensure preservation of their quality and fitness for use and shall be located to facilitate prompt inspection. All equipment for handling and transporting materials and concrete must be clean before any material or concrete is placed in them.

The use of pit-run aggregates shall not be permitted unless the pit-run aggregate has been screened and washed, and all fine and coarse aggregates stored separately and kept clean. The mixing of different aggregates from different sources in one storage stockpile or alternating batches of different aggregates shall not be permitted.

a. Reactivity. Fine aggregate and coarse aggregates to be used in all concrete shall have been tested separately within six months of the project in accordance with ASTM C1260. Test results shall be submitted to the RPR. The aggregate shall be considered innocuous if the expansion of test specimens, tested in accordance with ASTM C1260, does not exceed 0.08% at 14 days (16 days from casting). If the expansion either or both test specimen is greater than 0.08% at 14 days, but less than 0.20%, a minimum of 25% of Type F fly ash, or between 40% and 55% of slag cement shall be used in the concrete mix.

If the expansion is greater than 0.20% the aggregates shall not be used, and test results for other aggregates must be submitted for evaluation; or aggregates that meet P-501 reactivity test requirements may be utilized.

610-2.2 Coarse aggregate. The coarse aggregate for concrete shall meet the requirements of ASTM C33 and the requirements of Table 4, Class Designation 5S; and the grading requirements shown below, as required for the project.

Coarse Aggregate Grading Requirements

Maximum Aggregate Size	ASTM C33, Table 3 Grading Requirements (Size No.)
1 1/2 inch (37.5 mm)	467 or 4 and 67
1 inch (25 mm)	57
3/4 inch (19 mm)	67
1/2 inch (12.5 mm)	7

610-2.2.1 Coarse Aggregate susceptibility to durability (D) cracking. Not used.

610-2.3 Fine aggregate. The fine aggregate for concrete shall meet all fine aggregate requirements of ASTM C33.

610-2.4 Cement. Cement shall conform to the requirements of ASTM C150, Type I.

610-2.5 Cementitious materials.

a. Fly ash. Fly ash shall meet the requirements of ASTM C618, with the exception of loss of ignition, where the maximum shall be less than 6%. Fly ash shall have a Calcium Oxide (CaO) content of less than 15% and total available alkali content less than 3% per ASTM C311. Fly ash produced in furnace operations using liming materials or soda ash (sodium carbonate) as an additive shall not be acceptable. The Contractor shall furnish the previous three most recent, consecutive ASTM C618 reports for each source of fly ash proposed in the concrete mix, and shall furnish each additional report as they become available during the project. The reports can be used for acceptance or the material may be tested independently by the RPR.

b. Slag cement (ground granulated blast furnace (GGBF)). Slag cement shall conform to ASTM C989, Grade 100 or Grade 120. Slag cement shall be used only at a rate between 25% and 55% of the total cementitious material by mass.

610-2.6 Water. Water used in mixing or curing shall be from potable water sources. Other sources shall be tested in accordance with ASTM C1602 prior to use.

610-2.7 Admixtures. The Contractor shall submit certificates indicating that the material to be furnished meets all of the requirements indicated below. In addition, the RPR may require the Contractor to submit complete test data from an approved laboratory showing that the material to be furnished meets all of the requirements of the cited specifications. Subsequent tests may be made of samples taken by the RPR from the supply of the material being furnished or proposed for use on the work to determine whether the admixture is uniform in quality with that approved.

a. Air-entraining admixtures. Air-entraining admixtures shall meet the requirements of ASTM C260 and shall consistently entrain the air content in the specified ranges under field conditions. The air-entrainment agent and any water reducer admixture shall be compatible.

b. Water-reducing admixtures. Water-reducing admixture shall meet the requirements of ASTM C494, Type A, B, or D. ASTM C494, Type F and G high range water reducing admixtures and ASTM C1017 flowable admixtures shall not be used.

c. Other chemical admixtures. The use of set retarding, and set-accelerating admixtures shall be approved by the RPR. Retarding shall meet the requirements of ASTM C494, Type A, B, or D

and set-accelerating shall meet the requirements of ASTM C494, Type C. Calcium chloride and admixtures containing calcium chloride shall not be used.

610-2.8 Premolded joint material. Premolded joint material for expansion joints shall meet the requirements of ASTM D1751.

610-2.9 Joint filler. The filler for joints shall meet the requirements of Item P-605, unless otherwise specified.

610-2.10 Steel reinforcement. Reinforcing shall consist of welded steel wire fabric conforming to the requirements of ASTM A1064.

610-2.11 Materials for curing concrete. Curing materials shall conform to the following:

Materials for Curing

Waterproof paper	ASTM C171
Clear or white Polyethylene Sheeting	ASTM C171
White-pigmented Liquid Membrane-Forming Compound, Type 2, Class B	ASTM C309

CONSTRUCTION METHODS

610-3.1 General. The Contractor shall furnish all labor, materials, and services necessary for, and incidental to, the completion of all work as shown on the drawings and specified here. All machinery and equipment used by the Contractor on the work, shall be of sufficient size to meet the requirements of the work. All work shall be subject to the inspection and approval of the RPR.

610-3.2 Concrete Mixture. The concrete shall develop a compressive strength of 4000 psi in 28 days as determined by test cylinders made in accordance with ASTM C31 and tested in accordance with ASTM C39. The concrete shall contain not less than 470 pounds of cementitious material per cubic yard (280 kg per cubic meter). The water cementitious ratio shall not exceed 0.45 by weight. The air content of the concrete shall be 5% +/- 1.2% as determined by ASTM C231 and shall have a slump of not more than 4 inches (100 mm) as determined by ASTM C143.

610-3.3 Mixing. Concrete may be mixed at the construction site, at a central point, or wholly or in part in truck mixers. The concrete shall be mixed and delivered in accordance with the requirements of ASTM C94 or ASTM C685.

The concrete shall be mixed only in quantities required for immediate use. Concrete shall not be mixed while the air temperature is below 40°F (4°C) without the RPRs approval. If approval is granted for mixing under such conditions, aggregates or water, or both, shall be heated and the concrete shall be placed at a temperature not less than 50°F (10°C) nor more than 100°F (38°C). The Contractor shall be held responsible for any defective work, resulting from freezing or injury in any manner during placing and curing, and shall replace such work at his expense.

Retempering of concrete by adding water or any other material is not permitted.

The rate of delivery of concrete to the job shall be sufficient to allow uninterrupted placement of the concrete.

610-3.4 Forms. Concrete shall not be placed until all the forms and reinforcements have been inspected and approved by the RPR. Forms shall be of suitable material and shall be of the type, size, shape, quality, and strength to build the structure as shown on the plans. The forms shall be

true to line and grade and shall be mortar-tight and sufficiently rigid to prevent displacement and sagging between supports. The surfaces of forms shall be smooth and free from irregularities, dents, sags, and holes. The Contractor shall be responsible for their adequacy.

The internal form ties shall be arranged so no metal will show in the concrete surface or discolor the surface when exposed to weathering when the forms are removed. All forms shall be wetted with water or with a non-staining mineral oil, which shall be applied immediately before the concrete is placed. Forms shall be constructed so they can be removed without injuring the concrete or concrete surface.

610-3.5 Placing reinforcement. All reinforcement shall be accurately placed, as shown on the plans, and shall be firmly held in position during concrete placement. Bars shall be fastened together at intersections. The reinforcement shall be supported by approved metal chairs. Shop drawings, lists, and bending details shall be supplied by the Contractor when required.

610-3.6 Embedded items. Before placing concrete, all embedded items shall be firmly and securely fastened in place as indicated. All embedded items shall be clean and free from coating, rust, scale, oil, or any foreign matter. The concrete shall be spaded and consolidated around and against embedded items. The embedding of wood shall not be allowed.

610-3.7 Concrete Consistency. The Contractor shall monitor the consistency of the concrete delivered to the project site; collect each batch ticket; check temperature; and perform slump tests on each truck at the project site in accordance with ASTM C143.

610-3.8 Placing concrete. All concrete shall be placed during daylight hours, unless otherwise approved. The concrete shall not be placed until the depth and condition of foundations, the adequacy of forms and falsework, and the placing of the steel reinforcing have been approved by the RPR. Concrete shall be placed as soon as practical after mixing, but in no case later than one (1) hour after water has been added to the mix. The method and manner of placing shall avoid segregation and displacement of the reinforcement. Troughs, pipes, and chutes shall be used as an aid in placing concrete when necessary. The concrete shall not be dropped from a height of more than 5 feet (1.5 m). Concrete shall be deposited as nearly as practical in its final position to avoid segregation due to rehandling or flowing. Do not subject concrete to procedures which cause segregation. Concrete shall be placed on clean, damp surfaces, free from running water, or on a properly consolidated soil foundation.

610-3.9 Vibration. Vibration shall follow the guidelines in American Concrete Institute (ACI) Committee 309R, Guide for Consolidation of Concrete.

610-3.10 Joints. Joints shall be constructed as indicated on the plans.

610-3.11 Finishing. All exposed concrete surfaces shall be true, smooth, and free from open or rough areas, depressions, or projections. All concrete horizontal plane surfaces shall be brought flush to the proper elevation with the finished top surface struck-off with a straightedge and floated.

610-3.12 Curing and protection. All concrete shall be properly cured in accordance with the recommendations in American Concrete Institute (ACI) 308R, Guide to External Curing of Concrete. The concrete shall be protected from damage until project acceptance.

610-3.13 Cold weather placing. When concrete is placed at temperatures below 40°F (4°C), follow the cold weather concreting recommendations found in ACI 306R, Cold Weather Concreting.

610-3.14 Hot weather placing. When concrete is placed in hot weather greater than 85°F (30 °C), follow the hot weather concreting recommendations found in ACI 305R, Hot Weather Concreting.

QUALITY ASSURANCE (QA)

610-4.1 Quality Assurance sampling and testing. Concrete for each day's placement will be accepted on the basis of the compressive strength specified in paragraph 610-3.2. The RPR will sample the concrete in accordance with ASTM C172; test the slump in accordance with ASTM C143; test air content in accordance with ASTM C231; make and cure compressive strength specimens in accordance with ASTM C31; and test in accordance with ASTM C39. The QA testing agency will meet the requirements of ASTM C1077.

The Contractor shall provide adequate facilities for the initial curing of cylinders.

610-4.2 Defective work. Any defective work that cannot be satisfactorily repaired as determined by the RPR, shall be removed and replaced at the Contractor's expense. Defective work includes, but is not limited to, uneven dimensions, honeycombing and other voids on the surface or edges of the concrete.

METHOD OF MEASUREMENT

610-5.1 Concrete shall be measured by the number of square yards (square meters) based on the dimensions shown on the plans of concrete complete in place and accepted.

BASIS OF PAYMENT

610-6.1 Payment shall be made at the contract price by the number of square yards (square meters). This price shall be full compensation for furnishing all materials including reinforcement and embedded items and for all preparation, delivery, installation, and curing of these materials, and for all labor, equipment, tools, and incidentals necessary to complete the item.

Payment will be made under:

Item P-610-6.1	Concrete, per square yards (square meters)
----------------	--

REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

ASTM International (ASTM)

ASTM A184	Standard Specification for Welded Deformed Steel Bar Mats for Concrete Reinforcement
ASTM A615	Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement
ASTM A704	Standard Specification for Welded Steel Plain Bar or Rod Mats for Concrete Reinforcement
ASTM A706	Standard Specification for Low-Alloy Steel Deformed and Plain Bars for Concrete Reinforcement
ASTM A775	Standard Specification for Epoxy-Coated Steel Reinforcing Bars
ASTM A884	Standard Specification for Epoxy-Coated Steel Wire and Welded Wire Reinforcement

ASTM A934	Standard Specification for Epoxy-Coated Prefabricated Steel Reinforcing Bars
ASTM A1064	Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete
ASTM C31	Standard Practice for Making and Curing Concrete Test Specimens in the Field
ASTM C33	Standard Specification for Concrete Aggregates
ASTM C39	Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens
ASTM C94	Standard Specification for Ready-Mixed Concrete
ASTM C136	Standard Test Method for Sieve or Screen Analysis of Fine and Coarse Aggregates
ASTM C114	Standard Test Methods for Chemical Analysis of Hydraulic Cement
ASTM C136	Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates
ASTM C143	Standard Test Method for Slump of Hydraulic-Cement Concrete
ASTM C150	Standard Specification for Portland Cement
ASTM C171	Standard Specification for Sheet Materials for Curing Concrete
ASTM C172	Standard Practice for Sampling Freshly Mixed Concrete
ASTM C231	Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method
ASTM C260	Standard Specification for Air-Entraining Admixtures for Concrete
ASTM C309	Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete
ASTM C311	Standard Test Methods for Sampling and Testing Fly Ash or Natural Pozzolans for Use in Portland-Cement Concrete
ASTM C494	Standard Specification for Chemical Admixtures for Concrete
ASTM C618	Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete
ASTM C666	Standard Test Method for Resistance of Concrete to Rapid Freezing and Thawing
ASTM C685	Standard Specification for Concrete Made by Volumetric Batching and Continuous Mixing
ASTM C989	Standard Specification for Slag Cement for Use in Concrete and Mortars
ASTM C1017	Standard Specification for Chemical Admixtures for Use in Producing Flowing Concrete

ASTM C1077	Standard Practice for Agencies Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Testing Agency Evaluation
ASTM C1157	Standard Performance Specification for Hydraulic Cement
ASTM C1260	Standard Test Method for Potential Alkali Reactivity of Aggregates (Mortar-Bar Method)
ASTM C1365	Standard Test Method for Determination of the Proportion of Phases in Portland Cement and Portland-Cement Clinker Using X-Ray Powder Diffraction Analysis
ASTM C1602	Standard Specification for Mixing Water Used in the Production of Hydraulic Cement Concrete
ASTM D1751	Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Asphalt Types)
ASTM D1752	Standard Specification for Preformed Sponge Rubber Cork and Recycled PVC Expansion Joint Fillers for Concrete Paving and Structural Construction
American Concrete Institute (ACI)	
ACI 305R	Hot Weather Concreting
ACI 306R	Cold Weather Concreting
ACI 308R	Guide to External Curing of Concrete
ACI 309R	Guide for Consolidation of Concrete

END OF ITEM P-610

Item P-620

Runway and Taxiway Marking

DESCRIPTION

620-1.1 This item shall consist of the preparation and painting of numbers, markings, and stripes on the surface of runways, taxiways, and aprons, in accordance with these specifications and at the locations shown on the plans, or as directed by the Resident Project Representative (RPR). The terms “paint” and “marking material” as well as “painting” and “application of markings” are interchangeable throughout this specification.

MATERIALS

620-2.1 Materials acceptance. The Contractor shall furnish manufacturer’s certified test reports, for materials shipped to the project. The certified test reports shall include a statement that the materials meet the specification requirements. This certification along with a copy of the paint manufacturer’s surface preparation; marking materials, including adhesion, flow promoting and/or floatation additive; and application requirements must be submitted and approved by the Resident Project Representative (RPR) prior to the initial application of markings. The reports can be used for material acceptance or the RPR may perform verification testing. The reports shall not be interpreted as a basis for payment. The Contractor shall notify the RPR upon arrival of a shipment of materials to the site. All material shall arrive in sealed containers that are easily quantifiable for inspection by the RPR.

620-2.2 Marking materials.

Table 1. Marking Materials

Paint ¹				Glass Beads ²	
Type	Color	Fed Std. 595 Number	Application Rate Maximum	Type	Application Rate Minimum
Waterborne Type II	White	37925	115 ft ² /gal (2.8 m ² /l)	III	10 lb/gal (1.2 kg/l)
Waterborne Type II	Yellow	33538 or 33655	115 ft ² /gal (2.8 m ² /l)	III	10 lb/gal (1.2 kg/l)
Waterborne Type II	Black	37038	115 ft ² /gal (2.8 m ² /l)	N/A	Not Required
Waterborne (Temporary)	Yellow	33538 or 33655	230 ft ² /gal (2.2 m ² /l)	III	Not Required

¹ See paragraph 620-2.2a

² See paragraph 620-2.2b

a. Paint. Paint shall be waterborne in accordance with the requirements of this paragraph. Paint colors shall comply with Federal Standard No. 595.

Waterborne. Paint shall meet the requirements of Federal Specification TT-P-1952F, Type II. The non-volatile portion of the vehicle for all paint types shall be composed of a 100% acrylic polymer as determined by infrared spectral analysis.

b. Reflective media. Glass beads for white and yellow paint shall meet the requirements for Federal Specification TT-B-1325D Type III.

Glass beads shall be treated with all compatible coupling agents recommended by the manufacturers of the paint and reflective media to ensure adhesion and embedment.

Glass beads shall not be used in black and green paint.

Type III glass beads shall not be used in red and pink paint.

CONSTRUCTION METHODS

620-3.1 Weather limitations. Painting shall only be performed when the surface is dry, and the ambient temperature and the pavement surface temperature meet the manufacturer's recommendations in accordance with paragraph 620-2.1. Painting operations shall be discontinued when the ambient or surface temperatures does not meet the manufacturer's recommendations. Markings shall not be applied when the wind speed exceeds 10 mph unless windscreens are used to shroud the material guns. Markings shall not be applied when weather conditions are forecasts to not be within the manufacturers' recommendations for application and dry time.

620-3.2 Equipment. Equipment shall include the apparatus necessary to properly clean the existing surface, a mechanical marking machine, a bead dispensing machine, and such auxiliary hand-painting equipment as may be necessary to satisfactorily complete the job.

The mechanical marker shall be an atomizing spray-type or airless type marking machine with automatic glass bead dispensers suitable for application of traffic paint. It shall produce an even and uniform film thickness and appearance of both paint and glass beads at the required coverage and shall apply markings of uniform cross-sections and clear-cut edges without running or spattering and without over spray. The marking equipment for both paint and beads shall be calibrated daily.

620-3.3 Preparation of surfaces. Immediately before application of the paint, the surface shall be dry and free from dirt, grease, oil, laitance, or other contaminants that would reduce the bond between the paint and the pavement. Use of any chemicals or impact abrasives during surface preparation shall be approved in advance by the RPR. After the cleaning operations, sweeping, blowing, or rinsing with pressurized water shall be performed to ensure the surface is clean and free of grit or other debris left from the cleaning process.

a. Preparation of new pavement surfaces. The area to be painted shall be cleaned by broom, blower, water blasting, or by other methods approved by the RPR to remove all contaminants, including PCC curing compounds, minimizing damage to the pavement surface.

b. Preparation of pavement to remove existing markings. Existing pavement markings shall be removed by rotary grinding, water blasting, or by other methods approved by the RPR minimizing damage to the pavement surface. The removal area may need to be larger than the area

of the markings to eliminate ghost markings. After removal of markings on asphalt pavements, apply a fog seal or seal coat to 'block out' the removal area to eliminate 'ghost' markings.

c. Preparation of pavement markings prior to remarking. Prior to remarking existing markings, loose existing markings must be removed minimizing damage to the pavement surface, with a method approved by the RPR. After removal, the surface shall be cleaned of all residue or debris.

Prior to the application of markings, the Contractor shall certify in writing that the surface is dry and free from dirt, grease, oil, laitance, or other foreign material that would prevent the bond of the paint to the pavement or existing markings. This certification along with a copy of the paint manufactures application and surface preparation requirements must be submitted to the RPR prior to the initial application of markings.

620-3.4 Layout of markings. The proposed markings shall be laid out in advance of the paint application. The locations of markings to receive glass beads shall be shown on the plans.

620-3.5 Application. A period of 30 days shall elapse between placement of surface course or seal coat and application of the permanent paint markings. Paint shall be applied at the locations and to the dimensions and spacing shown on the plans. Paint shall not be applied until the layout and condition of the surface has been approved by the RPR.

The edges of the markings shall not vary from a straight line more than 1/2 inch (12 mm) in 50 feet (15 m), and marking dimensions and spacing shall be within the following tolerances:

Marking Dimensions and Spacing Tolerance

Dimension and Spacing	Tolerance
36 inch (910 mm) or less	±1/2 inch (12 mm)
greater than 36 inch to 6 feet (910 mm to 1.85 m)	±1 inch (25 mm)
greater than 6 feet to 60 feet (1.85 m to 18.3 m)	±2 inch (50 mm)
greater than 60 feet (18.3 m)	±3 inch (76 mm)

The paint shall be mixed in accordance with the manufacturer’s instructions and applied to the pavement with a marking machine at the rate shown in Table 1. The addition of thinner will not be permitted.

Glass beads shall be distributed upon the marked areas at the locations shown on the plans to receive glass beads immediately after application of the paint. A dispenser shall be furnished that is properly designed for attachment to the marking machine and suitable for dispensing glass beads. Glass beads shall be applied at the rate shown in Table 1. Glass beads shall not be applied to black paint or green paint. Glass beads shall adhere to the cured paint or all marking operations shall cease until corrections are made. Different bead types shall not be mixed. Regular monitoring of glass bead embedment and distribution should be performed.

620-3.6 Application--preformed thermoplastic airport pavement markings.

Preformed thermoplastic pavement markings not used.

620-3.7 Control strip. Prior to the full application of airfield markings, the Contractor shall prepare a control strip in the presence of the RPR. The Contractor shall demonstrate the surface preparation method and all striping equipment to be used on the project. The marking equipment must achieve the prescribed application rate of paint and population of glass beads (per Table 1) that are properly embedded and evenly distributed across the full width of the marking. Prior to

acceptance of the control strip, markings must be evaluated during darkness to ensure a uniform appearance.

620-3.8 Retro-reflectance. Reflectance shall be measured with a portable retro-reflectometer meeting ASTM E1710 (or equivalent). A total of 6 reading shall be taken over a 6 square foot area with 3 readings taken from each direction. The average shall be equal to or above the minimum levels of all readings which are within 30% of each other.

Minimum Retro-Reflectance Values

Material	Retro-reflectance mcd/m ² /lux		
	White	Yellow	Red
Initial Type I	300	175	35
Initial Type III	600	300	35
Initial Thermoplastic	225	100	35
All materials, remark when less than ¹	100	75	10

¹ Prior to remarking determine if removal of contaminants on markings will restore retro-reflectance

620-3.9 Protection and cleanup. After application of the markings, all markings shall be protected from damage until dry. All surfaces shall be protected from excess moisture and/or rain and from disfiguration by spatter, splashes, spillage, or drippings. The Contractor shall remove from the work area all debris, waste, loose reflective media, and by-products generated by the surface preparation and application operations to the satisfaction of the RPR. The Contractor shall dispose of these wastes in strict compliance with all applicable state, local, and federal environmental statutes and regulations.

METHOD OF MEASUREMENT

620-4.1a The quantity of markings shall be paid for shall be measured by the number of square feet (square meters) of painting.

620-4.1b The quantity of temporary markings to be paid for shall be the number of square feet (square meters) of painting performed in accordance with the specifications and accepted by the RPR. Temporary marking includes surface preparation, application and complete removal of the temporary marking.

BASIS OF PAYMENT

620-5.1a This price shall be full compensation for furnishing all materials and for all labor, equipment, tools, and incidentals necessary to complete the item complete in place and accepted by the RPR in accordance with these specifications.

620-5.4b Payment for temporary markings shall be made at the contract price for the number of square feet (square meters) of painting. This price shall be full compensation for furnishing all materials and for all labor, equipment, tools, and incidentals necessary to complete the item.

Payment will be made under:

- | | |
|-----------------|--|
| Item P-620-5.2b | Pavement Marking per square foot (square meter) |
| Item P-620-5.4d | Temporary pavement marking per square foot (per square meter). |

REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

ASTM International (ASTM)

- | | |
|------------|---|
| ASTM D476 | Standard Classification for Dry Pigmentary Titanium Dioxide Products |
| ASTM D968 | Standard Test Methods for Abrasion Resistance of Organic Coatings by Falling Abrasive |
| ASTM D1652 | Standard Test Method for Epoxy Content of Epoxy Resins |
| ASTM D2074 | Standard Test Method for Total, Primary, Secondary, and Tertiary Amine Values of Fatty Amines by Alternative Indicator Method |
| ASTM D2240 | Standard Test Method for Rubber Property - Durometer Hardness |
| ASTM D7585 | Standard Practice for Evaluating Retroreflective Pavement Markings Using Portable Hand-Operated Instruments |
| ASTM E303 | Standard Test Method for Measuring Surface Frictional Properties Using the British Pendulum Tester |
| ASTM E1710 | Standard Test Method for Measurement of Retroreflective Pavement Marking Materials with CEN-Prescribed Geometry Using a Portable Retroreflectometer |
| ASTM E2302 | Standard Test Method for Measurement of the Luminance Coefficient Under Diffuse Illumination of Pavement Marking Materials Using a Portable Reflectometer |
| ASTM G154 | Standard Practice for Operating Fluorescent Ultraviolet (UV) Lamp Apparatus for Exposure of Nonmetallic Materials |

Code of Federal Regulations (CFR)

- | | | | | | | | |
|--|-----|------|-----|----------|------|--------|----|
| 40 | CFR | Part | 60, | Appendix | A-7, | Method | 24 |
| Determination of volatile matter content, water content, density, volume solids, and weight solids of surface coatings | | | | | | | |

29 CFR Part 1910.1200 Hazard Communication

Federal Specifications (FED SPEC)

- | | |
|---------------------|---|
| FED SPEC TT-B-1325D | Beads (Glass Spheres) Retro-Reflective |
| FED SPEC TT-P-1952F | Paint, Traffic and Airfield Marking, Waterborne |
| FED STD 595 | Colors used in Government Procurement |

Commercial Item Description

- | | |
|-----------|-------------------------------|
| A-A-2886B | Paint, Traffic, Solvent Based |
|-----------|-------------------------------|

P-620-5

Advisory Circulars (AC)

AC 150/5340-1

Standards for Airport Markings

AC 150/5320-12

Measurement, Construction, and Maintenance of Skid Resistant
Airport Pavement Surfaces

END OF ITEM P-620

Item P-630

Refined Coal Tar Emulsion Without Additives, Slurry Seal Surface Treatment

630-1.1 This item shall consist of a mixture of emulsified asphalt, mineral aggregate, and water properly proportioned, mixed, and spread on an asphalt pavement surface, including airport pavements serving small airplanes, roads, and other general applications. The purpose of this refined coal tar emulsion product is to provide a fuel-resistant surface where pavements are subjected to fuel spills. The application of the surface treatment shall be in accordance with these specifications and shall conform to the dimensions shown on the plans or as directed by the Resident Project Representative (RPR).

630-1.2 General. This item shall consist of a mixture of refined coal tar emulsion, mineral aggregate, and water properly proportioned, mixed, and applied as a slurry seal on new or existing (aged) asphalt concrete pavement.

MATERIALS

630-2.1 Refined coal tar emulsion. A refined coal tar emulsion prepared from a high temperature refined coal tar conforming to the requirements of ASTM D490 for grade 11-12. The use of oil and water gas tar is not allowed. Base refined coal tar emulsion must conform to all requirements of ASTM D5727.

The Contractor shall provide a copy of the manufacturer's Certificate of Analysis (COA) for the emulsified asphalt delivered to the project. If the asphalt emulsion is diluted at other than the manufacturer's facility, the Contractor shall provide a supplemental COA from an independent laboratory verifying the asphalt emulsion properties.

The COA shall be provided to and approved by the RPR before the emulsified asphalt is applied. The furnishing of the vendor's certified test report for the asphalt material shall not be interpreted as a basis for final acceptance. The manufacturer's COA may be subject to verification by testing the material delivered for use on the project.

a. Health, safety, and environment. The Contractor must provide a complete Safety Data Sheet (SDS) in accordance with U.S. Department of Labor, Occupational Safety and Health Administration (OSHA), Regulations (Standards – 29 CFR), 1910.1200 which establishes the requirement and minimum information for the MSDS for hazardous materials. The MSDS, Section II, shall include the Chemical Abstracts Service (CAS) registry numbers for all applicable hazardous ingredients in the coal tar emulsion product. The Contractor must provide the manufacturer's certification that the product complies with the Code of Federal Regulation (CFR) Title 40 – Protection of Environment. The manufacturer's certification shall address compliance for Air Programs, Part 59, National Volatile Organic Compound Emission Standards for Consumer and Commercial Products (for the airport location) and Water Programs, Part 116, Designation of Hazardous Substances.

630-2.2 Aggregate. The aggregate shall be washed dry silica sand or boiler slag free of dust, trash, clay, organic materials or other deleterious substances. The aggregate shall meet the gradation requirements below when tested in accordance with ASTM C136. The refined coal tar emulsion supplier must give written approval of the aggregate used in the mix design.

Gradation of Aggregates*

Sieve Size		Percent Retained	
		Minimum	Maximum
#20 or coarser	850 μm	0	2
#30	600 μm	0	12
#40	425 μm	2	60
#50	300 μm	5	60
#70	212 μm	5	60
#100	150 μm	5	30
#140	106 μm	0	10
#200	75 μm	0	2
Finer than #200		0	0.3

* Table represents the maximum range of aggregate gradations.

630-2.3 Water. Water used in mixing or curing shall be from potable water sources and at least 50°F (10°C). Other sources shall be tested in accordance with ASTM C1602 prior to use. The pH of the water shall conform to the requirements of the coal tar emulsion manufacturer.

630-2.4 Crack sealant. Crack sealant shall be certified for compatibility with the refined coal tar emulsion by the manufacturer of the refined coal tar emulsion, and approved by the RPR.

630-2.5 Oil spot primer. Oil spot primer shall be certified for compatibility with the refined coal tar emulsion by the manufacturer of the refined coal tar emulsion, and approved by the RPR.

630-2.6 Pavement primer. Pavement primer shall be certified for compatibility with the refined coal tar emulsion by the manufacturer of the refined coal tar emulsion, and approved by the RPR.

COMPOSITION AND APPLICATION

630-3.1 Composition. The refined coal tar emulsion seal coat is to consist of a mixture of refined coal tar emulsion, water and aggregate, and be proportioned as shown in the table below titled “Composition of Mixture Per 100 Gallons (379 Liters) of Refined Coal Tar Emulsion.” The composition must have written approval of the coal tar emulsion manufacturer.

630-3.2 Quantities of materials per square yard (square meter). The Contractor shall submit the recommended formulation of water, emulsion, aggregate and application rate proposed for use to a testing laboratory together with sufficient materials to verify the formulation at least seven (7) days prior to the start of operations. The mix design shall be within the range shown in the table below. No seal coat shall be produced for payment until a mix has been approved by the RPR. The formulation shall pass the fuel resistance test in accordance with ASTM D5727.

The mix formula for each mixture shall be in effect until modified in writing by the RPR.

Composition of Mixture Per 100 Gallons (379 Liters) of Refined Coal Tar Emulsion

Application	Refined Coal Tar Emulsion Gallons (Liters)	Water Gallons (Liters)	Aggregate lb (km)	Formula Rate of Application of Mix per Square Yard (Square Meter)	
				Minimum Gallons (Liters)	Maximum Gallons (Liters)
Prime Coat (where required) as specified by the coal tar emulsion manufacturer					
1st Seal Coat	100 (379)	25-30 (95-114)	300-500 (136-228)	0.12 (0.54)	0.17 (0.77)
2nd Seal Coat	100 (379)	25-30 (95-114)	300-500 (136-228)	0.12 (0.54)	0.17 (0.77)

630-3.3 Application rate. Application rates are not to exceed 0.17 gal/yd²/coat (0.77 liters/m²/coat), and at no time are total coats to exceed 0.51 gal/yd² (2.3 liters/m²).

630-3.4 Control strip. Prior to full production, the Contractor shall prepare a quantity of mixture in the proportions shown in the approved mix design sufficient to place a control strip a minimum of 250 square yard (209 m²) at the rate specified in the job mix formula. The test area shall be designated by the RPR and will be located on a representative section of the pavement to be seal coated. Separate control strips by a minimum of 200 feet between sections. The actual application rate will be determined by the RPR during placement of the control strip and will depend on the condition of the pavement surface.

The control strip shall be used to verify the adequacy of the mix design and to determine the application rate. The same equipment and method of operations shall be used on the control strip as will be used on the remainder of the work.

If the control strip proves to be unsatisfactory, the necessary adjustments to the job mix formula, mix composition, application rate, placement operations, and equipment shall be made. Additional control strips shall be placed and evaluated, if required. Full production shall not begin without the RPR's approval. Acceptable control strips shall be paid for in accordance with paragraph 630-7.1.

A qualified manufacturer's representative shall be present in the field to assist the Contractor in applying control areas and/or control strips to determine the optimum application rate of both emulsion and sand.

CONSTRUCTION METHODS

630-4.1 Weather limitations. The seal coat shall not be applied when the surface is wet or when the humidity or impending weather conditions will not allow proper curing. The seal coat shall be applied only when the atmospheric or pavement temperature is 50°F (10°C) and rising and is expected to remain above 50°F (10°C) for 24 hours, unless otherwise directed by the RPR.

630-4.2 Equipment and tools. The Contractor shall furnish all equipment, tools, and machinery necessary for the performance of the work.

a. Distributors. Distributors or spray units used for the spray application of the seal coat shall be self-propelled and capable of uniformly applying 0.12 to 0.55 gallons per square yard (0.54 to 2.5 liters per square meter) of material over the required width of application. Distributors shall be

equipped with removable manhole covers, tachometers, pressure gauges, and volume-measuring devices.

The mix tank shall have a mechanically powered, full-sweep, mixer with sufficient power to move and homogeneously mix the entire contents of the tank.

The distributor shall be equipped with a positive placement pump so that a constant pressure can be maintained on the mixture to the spray nozzles.

b. Mixing equipment. The mixing machine shall have a continuous flow mixing unit capable of accurately delivering a predetermined proportion of aggregate, water, and emulsion, and of discharging the thoroughly mixed product on a continuous basis. The mixing unit shall be capable of thoroughly blending all ingredients together and discharging the material to the spreader box without segregation.

c. Spreading equipment. Spreading equipment shall be a mechanical-type squeegee distributor attached to the mixing machine, equipped with flexible material in contact with the surface to prevent loss of slurry from the spreader box. It shall be maintained to prevent loss of slurry on varying grades and adjusted to assure uniform spread. There shall be a lateral control device and a flexible strike-off capable of being adjusted to lay the slurry at the specified rate of application. The spreader box shall have an adjustable width. The box shall be kept clean; coal tar emulsion and aggregate build-up on the box shall not be permitted.

d. Hand squeegee or brush application. The use of hand spreading application shall be restricted to places not accessible to the mechanized equipment or to accommodate neat trim work at curbs, etc. Material that is applied by hand shall meet the same standards as that applied by machine.

e. Calibration. The Contractor shall furnish all equipment, materials and labor necessary to calibrate the equipment. It shall be calibrated to assure that it will produce and apply a mix that conforms to the job mix formula. Commercial equipment should be provided with a method of calibration by the manufacturer. All calibrations shall be made with the approved job materials prior to applying the seal coat to the pavement. A copy of the calibration test results shall be furnished to the RPR.

630-4.3 Preparation of asphalt pavement surfaces. Clean pavement surface immediately prior to placing the seal coat by sweeping, flushing well with water leaving no standing water, or a combination of both, so that it is free of dust, dirt, grease, vegetation, oil or any type of objectionable surface film. Remove oil or grease that has not penetrated the asphalt pavement by scraping or by scrubbing with a detergent, then wash thoroughly with clean water. After cleaning, treat these areas with the oil spot primer. Any additional surface preparation, such as crack repair, shall be in accordance with Item P-101, paragraph 101-3.6.

630-4.4 Mixing. Blend the coal tar emulsion mixture in the equipment described in paragraph 630-4.2 using the ingredients described in paragraph 630-3.2. The mixing must produce a smooth homogeneous mixture of uniform consistency. (Consult coal tar emulsion supplier for its recommended order of addition of the ingredients.) During the entire mixing and application process, no breaking, segregating or hardening of the emulsion, nor balling or lumping of the sand is to be permitted. Continue to agitate the seal coat mixture in the mixing tank at all times prior to and during application so that a consistent mix is available for application.

Small additional increments of water may be needed to provide a workable consistency, but in no case is the water content to exceed the specified amount.

630-4.5 Application of slurry seal surface treatment. The aggregate filled slurry seal surface treatment shall be applied at a uniform rate determined in paragraphs 630-3.2 and 630-3.3.

In order to provide maximum adhesion, the pavement shall be dampened with a fog spray of water if recommended by the supplier. No standing water shall remain on the surface.

If a prime coat is required, mix and apply the prime coat as specified in paragraph 630-3.2.

Apply the first coat uniformly to obtain the rate determined in paragraph 630-3.4.

Each coat shall be allowed to dry and cure initially before applying any subsequent coats. The initial drying shall allow evaporation of water of the applied mixture, resulting in the coating being able to sustain light foot traffic. The initial curing shall enable the mixture to withstand vehicle traffic without damage to the seal coat.

Apply the second coat in the same manner as outlined for the first coat.

Additional coats shall be applied over the entire surface as directed by the RPR.

The finished surface shall present a uniform texture.

The final coat shall be allowed to dry a minimum of eight hours in dry daylight conditions before opening to traffic, and initially cure enough to support vehicular traffic without damage to the seal coat.

Where marginal weather conditions exist during the eight-hour drying time, additional drying time shall be required. The length of time shall be as specified by the supplier. The surface shall be checked after the additional drying time for trafficability before opening the section to vehicle traffic.

Where striping is required, the striping paint used shall meet the requirements of Item P-620, shall be compatible with the seal coat and as recommended by the coal tar emulsion manufacturer.

QUALITY CONTROL

630-5.1 Contractor's certification. The Contractor shall furnish the manufacturer's certification that each consignment of emulsion shipped to the project meets the requirements of ASTM D5727, except that the water content shall not exceed 50%. The certification shall also indicate the solids and ash content of the emulsion and the date the tests were conducted. The certification shall be delivered to the RPR prior to the beginning of work. The manufacturer's certification for the emulsion shall not be interpreted as a basis for final acceptance. Any certification received shall be subject to verification by testing samples received for project use.

The Contractor shall also furnish a certification demonstrating a minimum of three years' experience in the application of coal tar emulsion seal coats.

630-5.2 Sampling. A minimum of one sample per day shall be tested for the properties in the table above titled "Composition of Mixture Per 100 Gallons (379 Liters) of Refined Coal Tar Emulsion." A random sample of approximately one-quarter of the composite mix will be obtained daily by the Contractor and stored in a glass container. The containers shall be sealed against contamination and retained in storage by the Owner for a period of six months. Samples shall be stored at room temperature and not be subjected to freezing temperatures.

A sample of undiluted coal tar emulsion shall be obtained from each consignment shipped to the job.

630-5.3 Records. The Contractor shall maintain an accurate record of each batch of materials used in the formulation of the seal coat and provide the documentation to the RPR daily.

METHOD OF MEASUREMENT

630-6.1 The refined coal tar emulsion shall be measured by the gallon. Only the actual quantity of undiluted refined coal tar emulsion will be measured for payment.

630-6.2 Aggregate shall be considered incidental and will not be measured separately for payment.

BASIS OF PAYMENT

630-7.1 Payment shall be made at the contract unit price per gallon for the refined coal tar emulsion.

These prices shall be full compensation for furnishing all materials, preparing, mixing, and applying these materials, and for all labor, equipment, tools, and incidentals necessary to complete the item.

Payment will be made under:

Item P-630-7.1	Refined Coal Tar Emulsion for Slurry Coat - per gallon
----------------	--

REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

ASTM International (ASTM)

ASTM C67	Standard Test Method for Sampling and Testing Brick and Structural Clay Tile
ASTM C136	Standard Test Method for Sieve or Screen Analysis of Fine and Coarse Aggregates
ASTM C1602	Standard Specification for Mixing Water Used in the Production of Hydraulic Cement Concrete
ASTM D490	Standard Specification for Road Tar
ASTM D3699	Standard Specification for Kerosine
ASTM D5727	Standard Specification for Emulsified Refined Coal Tar (Mineral Colloid Type)

Code of Federal Regulations (CFR)

29 CFR Part 1910.1200	Hazard Communication
40 CFR	Protection of the Environment

END OF ITEM P-630

Item T-901 Seeding

DESCRIPTION

901-1.1 This item shall consist of soil preparation, seeding, fertilizing and liming the areas shown on the plans or as directed by the RPR in accordance with these specifications.

MATERIALS

901-2.1 Seed. The species and application rates of grass, legume, and cover-crop seed furnished shall be those stipulated herein. Seed shall conform to the requirements of Federal Specification JJJ-S-181, Federal Specification, Seeds, Agricultural.

Seed shall be furnished separately or in mixtures in standard containers labeled in conformance with the Agricultural Marketing Service (AMS) Seed Act and applicable state seed laws with the seed name, lot number, net weight, percentages of purity and of germination and hard seed, and percentage of maximum weed seed content clearly marked for each kind of seed. The Contractor shall furnish the RPR duplicate signed copies of a statement by the vendor certifying that each lot of seed has been tested by a recognized laboratory for seed testing within six (6) months of date of delivery. This statement shall include: name and address of laboratory, date of test, lot number for each kind of seed, and the results of tests as to name, percentages of purity and of germination, and percentage of weed content for each kind of seed furnished, and, in case of a mixture, the proportions of each kind of seed. Wet, moldy, or otherwise damaged seed will be rejected.

Seeds shall be applied as follows:

Seed Properties and Rate of Application

Seed	Minimum Seed Purity (Percent)	Minimum Germination (Percent)	Rate of Application lb/acre (or lb/1,000 S.F.)
Hard Fescue	70%	85%	87.5 lb/ac
Chewings Fescue	20%	85%	25 lb/ac
KY Blue	5%	80%	6.25 lb/ac
Red Top	5%	90%	6.25 lb/ac

Seeding shall be performed during the period between March 15th-May 15th and August 15th-October 15th inclusive, unless otherwise approved by the RPR.

901-2.2 Lime. Lime shall be ground limestone containing not less than 85% of total carbonates, and shall be ground to such fineness that 90% will pass through a No. 20 (850 µm) mesh sieve and 50% will pass through a No. 100 (150 µm) mesh sieve. Coarser material will be acceptable, providing the rates of application are increased to provide not less than the minimum quantities and depth specified in the special provisions on the basis of the two sieve requirements above. Dolomitic lime or a high magnesium lime shall contain at least 10% of magnesium oxide. Lime

shall be applied at the rate of 4,000 lb/ac. All liming materials shall conform to the requirements of ASTM C602.

901-2.3 Fertilizer. [Fertilizer shall be standard commercial fertilizers supplied separately or in mixtures containing the percentages of total nitrogen, available phosphoric acid, and water-soluble potash. They shall be applied at the rate and to the depth specified, and shall meet the requirements of applicable state laws. They shall be furnished in standard containers with name, weight, and guaranteed analysis of contents clearly marked thereon. No cyanamide compounds or hydrated lime shall be permitted in mixed fertilizers.

The fertilizers may be supplied in one of the following forms:

- a. A dry, free-flowing fertilizer suitable for application by a common fertilizer spreader;
- b. A finely-ground fertilizer soluble in water, suitable for application by power sprayers; or
- c. A granular or pellet form suitable for application by blower equipment.

Fertilizers shall be 10-20-10 commercial fertilizer and shall be spread at the rate of 1,000 lb/ac.

901-2.4 Soil for repairs. The soil for fill and topsoiling of areas to be repaired shall be at least of equal quality to that which exists in areas adjacent to the area to be repaired. The soil shall be relatively free from large stones, roots, stumps, or other materials that will interfere with subsequent sowing of seed, compacting, and establishing turf, and shall be approved by the RPR before being placed.

CONSTRUCTION METHODS

901-3.1 Advance preparation and cleanup. After grading of areas has been completed and before applying fertilizer and ground limestone, areas to be seeded shall be raked or otherwise cleared of stones larger than 2 inches (50 mm) in any diameter, sticks, stumps, and other debris that might interfere with sowing of seed, growth of grasses, or subsequent maintenance of grass-covered areas. If any damage by erosion or other causes has occurred after the completion of grading and before beginning the application of fertilizer and ground limestone, the Contractor shall repair such damage include filling gullies, smoothing irregularities, and repairing other incidental damage.

An area to be seeded shall be considered a satisfactory seedbed without additional treatment if it has recently been thoroughly loosened and worked to a depth of not less than 5 inches (125 mm) as a result of grading operations and, if immediately prior to seeding, the top 3 inches (75 mm) of soil is loose, friable, reasonably free from large clods, rocks, large roots, or other undesirable matter, and if shaped to the required grade.

When the area to be seeded is sparsely sodded, weedy, barren and unworked, or packed and hard, any grass and weeds shall first be cut or otherwise satisfactorily disposed of, and the soil then scarified or otherwise loosened to a depth not less than 5 inches (125 mm). Clods shall be broken and the top 3 inches (75 mm) of soil shall be worked into a satisfactory seedbed by discing, or by use of cultipackers, rollers, drags, harrows, or other appropriate means.

901-3.2 Dry application method.

a. Liming. Lime shall be applied separately and prior to the application of any fertilizer or seed and only on seedbeds that have previously been prepared as described above. The lime shall then be worked into the top 3 inches (75 mm) of soil after which the seedbed shall again be properly graded and dressed to a smooth finish.

b. Fertilizing. Following advance preparations and cleanup fertilizer shall be uniformly spread at the rate that will provide not less than the minimum quantity stated in paragraph 901-2.3.

c. Seeding. Grass seed shall be sown at the rate specified in paragraph 901-2.1 immediately after fertilizing. The fertilizer and seed shall be raked within the depth range stated in the special provisions. Seeds of legumes, either alone or in mixtures, shall be inoculated before mixing or sowing, in accordance with the instructions of the manufacturer of the inoculant. When seeding is required at other than the seasons shown on the plans or in the special provisions, a cover crop shall be sown by the same methods required for grass and legume seeding.

d. Rolling. After the seed has been properly covered, the seedbed shall be immediately compacted by means of an approved lawn roller, weighing 40 to 65 pounds per foot (60 to 97 kg per meter) of width for clay soil (or any soil having a tendency to pack), and weighing 150 to 200 pounds per foot (223 to 298 kg per meter) of width for sandy or light soils.

901-3.3 Wet application method.

a. General. The Contractor may elect to apply seed and fertilizer (and lime, if required) by spraying them on the previously prepared seedbed in the form of an aqueous mixture and by using the methods and equipment described herein. The rates of application shall be as specified in the special provisions.

b. Spraying equipment. The spraying equipment shall have a container or water tank equipped with a liquid level gauge calibrated to read in increments not larger than 50 gallons (190 liters) over the entire range of the tank capacity, mounted so as to be visible to the nozzle operator. The container or tank shall also be equipped with a mechanical power-driven agitator capable of keeping all the solids in the mixture in complete suspension at all times until used.

The unit shall also be equipped with a pressure pump capable of delivering 100 gallons (380 liters) per minute at a pressure of 100 lb / sq inches (690 kPa). The pump shall be mounted in a line that will recirculate the mixture through the tank whenever it is not being sprayed from the nozzle. All pump passages and pipe lines shall be capable of providing clearance for 5/8 inch (16 mm) solids. The power unit for the pump and agitator shall have controls mounted so as to be accessible to the nozzle operator. There shall be an indicating pressure gauge connected and mounted immediately at the back of the nozzle.

The nozzle pipe shall be mounted on an elevated supporting stand in such a manner that it can be rotated through 360 degrees horizontally and inclined vertically from at least 20 degrees below to at least 60 degrees above the horizontal. There shall be a quick-acting, three-way control valve connecting the recirculating line to the nozzle pipe and mounted so that the nozzle operator can control and regulate the amount of flow of mixture delivered to the nozzle. At least three different types of nozzles shall be supplied so that mixtures may be properly sprayed over distance varying from 20 to 100 feet (6 to 30 m). One shall be a close-range ribbon nozzle, one a medium-range ribbon nozzle, and one a long-range jet nozzle. For ease of removal and cleaning, all nozzles shall be connected to the nozzle pipe by means of quick-release couplings.

In order to reach areas inaccessible to the regular equipment, an extension hose at least 50 feet (15 m) in length shall be provided to which the nozzles may be connected.

c. Mixtures. Lime, if required, shall be applied separately, in the quantity specified, prior to the fertilizing and seeding operations. Not more than 220 pounds (100 kg) of lime shall be added to and mixed with each 100 gallons (380 liters) of water. Seed and fertilizer shall be mixed together in the relative proportions specified, but not more than a total of 220 pounds (100 kg) of these combined solids shall be added to and mixed with each 100 gallons (380 liters) of water.

All water used shall be obtained from fresh water sources and shall be free from injurious chemicals and other toxic substances harmful to plant life. The Contractor shall identify to the RPR all sources of water at least two (2) weeks prior to use. The RPR may take samples of the water at the source or from the tank at any time and have a laboratory test the samples for chemical and saline content. The Contractor shall not use any water from any source that is disapproved by the RPR following such tests.

All mixtures shall be constantly agitated from the time they are mixed until they are finally applied to the seedbed. All such mixtures shall be used within two (2) hours from the time they were mixed or they shall be wasted and disposed of at approved locations.

d. Spraying. Lime, if required, shall be sprayed only upon previously prepared seedbeds. After the applied lime mixture has dried, the lime shall be worked into the top 3 inches (75 mm), after which the seedbed shall again be properly graded and dressed to a smooth finish.

Mixtures of seed and fertilizer shall only be sprayed upon previously prepared seedbeds on which the lime, if required, shall already have been worked in. The mixtures shall be applied by means of a high-pressure spray that shall always be directed upward into the air so that the mixtures will fall to the ground like rain in a uniform spray. Nozzles or sprays shall never be directed toward the ground in such a manner as might produce erosion or runoff.

Particular care shall be exercised to ensure that the application is made uniformly and at the prescribed rate and to guard against misses and overlapped areas. Proper predetermined quantities of the mixture in accordance with specifications shall be used to cover specified sections of known area.

Checks on the rate and uniformity of application may be made by observing the degree of wetting of the ground or by distributing test sheets of paper or pans over the area at intervals and observing the quantity of material deposited thereon.

On surfaces that are to be mulched as indicated by the plans or designated by the RPR, seed and fertilizer applied by the spray method need not be raked into the soil or rolled. However, on surfaces on which mulch is not to be used, the raking and rolling operations will be required after the soil has dried.

901-3.4 Maintenance of seeded areas. The Contractor shall protect seeded areas against traffic or other use by warning signs or barricades, as approved by the RPR. Surfaces gullied or otherwise damaged following seeding shall be repaired by regrading and reseeding as directed. The Contractor shall mow, water as directed, and otherwise maintain seeded areas in a satisfactory condition until final inspection and acceptance of the work.

When either the dry or wet application method outlined above is used for work done out of season, it will be required that the Contractor establish a good stand of grass of uniform color and density to the satisfaction of the RPR. A grass stand shall be considered adequate when bare spots are one square foot (0.01 sq m) or less, randomly dispersed, and do not exceed 3% of the area seeded.

METHOD OF MEASUREMENT

901-4.1 The quantity of seeding to be paid for shall be the number of units acre (sq m) measured on the ground surface, completed and accepted.

BASIS OF PAYMENT

901-5.1 Payment shall be made at the contract unit price per acre (sq m) or fraction thereof, which price and payment shall be full compensation for furnishing and placing all material and for all labor, equipment, tools, and incidentals necessary to complete the work prescribed in this item.

Payment will be made under:

Item 901-5.1 Seeding - per acre (sq m)

REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

ASTM International (ASTM)

ASTM C602 Standard Specification for Agricultural Liming Materials

Federal Specifications (FED SPEC)

FED SPEC JJJ-S-181, Federal Specification, Seeds, Agricultural

Advisory Circulars (AC)

AC 150/5200-33 Hazardous Wildlife Attractants on or Near Airports

FAA/United States Department of Agriculture

Wildlife Hazard Management at Airports, A Manual for Airport Personnel

END OF ITEM T-901

Item T-905

Topsoiling

DESCRIPTION

905-1.1 This item shall consist of preparing the ground surface for topsoil application, removing topsoil from designated stockpiles or areas to be stripped on the site or from approved sources off the site, and placing and spreading the topsoil on prepared areas in accordance with this specification at the locations shown on the plans or as directed by the RPR.

MATERIALS

905-2.1 Topsoil. Topsoil shall be the surface layer of soil with no admixture of refuse or any material toxic to plant growth, and it shall be reasonably free from subsoil and stumps, roots, brush, stones (2 inches (50 mm) or more in diameter), and clay lumps or similar objects. Brush and other vegetation that will not be incorporated with the soil during handling operations shall be cut and removed. Ordinary sod and herbaceous growth such as grass and weeds are not to be removed, but shall be thoroughly broken up and intermixed with the soil during handling operations. Heavy sod or other cover, which cannot be incorporated into the topsoil by discing or other means, shall be removed. The topsoil or soil mixture, unless otherwise specified or approved, shall have a pH range of approximately 5.5 pH to 7.6 pH, when tested in accordance with the methods of testing of the Association of Official Agricultural Chemists in effect on the date of invitation of bids. The organic content shall be not less than 3% nor more than 20% as determined by the wet-combustion method (chromic acid reduction). There shall be not less than 20% nor more than 80% of the material passing the 200 mesh (75 μ m) sieve as determined by the wash test in accordance with ASTM C117.

Natural topsoil may be amended by the Contractor with approved materials and methods to meet the above specifications.

905-2.2 Inspection and tests. Within 10 days following acceptance of the bid, the RPR shall be notified of the source of topsoil to be furnished by the Contractor. The topsoil shall be inspected to determine if the selected soil meets the requirements specified and to determine the depth to which stripping will be permitted. At this time, the Contractor may be required to take representative soil samples from several locations within the area under consideration and to the proposed stripping depths, for testing purposes as specified in paragraph 905-2.1.

CONSTRUCTION METHODS

905-3.1 General. Areas to be topsoiled shall be shown on the plans. If topsoil is available on the site, the location of the stockpiles or areas to be stripped of topsoil and the stripping depths shall be shown on the plans.

Suitable equipment necessary for proper preparation and treatment of the ground surface, stripping of topsoil, and for the handling and placing of all required materials shall be on hand, in good condition, and approved by the RPR before the various operations are started.

905-3.2 Preparing the ground surface. Immediately prior to dumping and spreading the topsoil on any area, the surface shall be loosened by discs or spike-tooth harrows, or by other means approved by the RPR, to a minimum depth of 2 inches (50 mm) to facilitate bonding of the topsoil

to the covered subgrade soil. The surface of the area to be topsoiled shall be cleared of all stones larger than 2 inches (50 mm) in any diameter and all litter or other material which may be detrimental to proper bonding, the rise of capillary moisture, or the proper growth of the desired planting. Limited areas, as shown on the plans, which are too compact to respond to these operations shall receive special scarification.

Grades on the area to be topsoiled, which have been established by others as shown on the plans, shall be maintained in a true and even condition. Where grades have not been established, the areas shall be smooth-graded and the surface left at the prescribed grades in an even and compacted condition to prevent the formation of low places or pockets where water will stand.

905-3.3 Obtaining topsoil. Prior to the stripping of topsoil from designated areas, any vegetation, briars, stumps and large roots, rubbish or stones found on such areas, which may interfere with subsequent operations, shall be removed using methods approved by the RPR. Heavy sod or other cover, which cannot be incorporated into the topsoil by discing or other means shall be removed.

When suitable topsoil is available on the site (see Project Special Provisions), the Contractor shall remove this material from the designated areas and to the depth as directed by the RPR. The topsoil shall be spread on areas already tilled and smooth-graded, or stockpiled in areas approved by the RPR. Any topsoil stockpiled by the Contractor shall be rehandled and placed without additional compensation. Any topsoil that has been stockpiled on the site by others, and is required for topsoil purposes, shall be removed and placed by the Contractor. The sites of all stockpiles and areas adjacent thereto which have been disturbed by the Contractor shall be graded if required and put into a condition acceptable for seeding.

When suitable topsoil is secured off the airport site, the Contractor shall locate and obtain the supply, subject to the approval of the RPR. The Contractor shall notify the RPR sufficiently in advance of operations in order that necessary measurements and tests can be made. The Contractor shall remove the topsoil from approved areas and to the depth as directed. The topsoil shall be hauled to the site of the work and placed for spreading, or spread as required. Any topsoil hauled to the site of the work and stockpiled shall be rehandled and placed without additional compensation.

905-3.4 Placing topsoil. The topsoil shall be evenly spread on the prepared areas to a uniform depth of 2 inches (50 mm) after compaction, unless otherwise shown on the plans or stated in the special provisions. Spreading shall not be done when the ground or topsoil is frozen, excessively wet, or otherwise in a condition detrimental to the work. Spreading shall be carried on so that turfing operations can proceed with a minimum of soil preparation or tilling.

After spreading, any large, stiff clods and hard lumps shall be broken with a pulverizer or by other effective means, and all stones or rocks (2 inches (50 mm) or more in diameter), roots, litter, or any foreign matter shall be raked up and disposed of by the Contractor. After spreading is completed, the topsoil shall be satisfactorily compacted by rolling with a cultipacker or by other means approved by the RPR. The compacted topsoil surface shall conform to the required lines, grades, and cross-sections. Any topsoil or other dirt falling upon pavements as a result of hauling or handling of topsoil shall be promptly removed.

METHOD OF MEASUREMENT

905-4.1 Topsoil obtained on the site shall be measured by the number of cubic yards (cubic meters) of topsoil measured in its original position and stripped or excavated. Topsoil stockpiled by others and removed for topsoil by the Contractor shall be measured by the number of cubic yards (cubic meters) of topsoil measured in the stockpile. Topsoil shall be measured by volume in cubic yards (cubic meters) computed by the method of end areas.

905-4.2 Topsoil obtained off the site shall be measured by the number of cubic yards (cubic meters) of topsoil measured in its original position and stripped or excavated. Topsoil shall be measured by volume in cubic yards (meters) computed by the method of end areas.

BASIS OF PAYMENT

905-5.1 Payment will be made at the contract unit price per cubic yard (cubic meter) for topsoil (obtained on the site). This price shall be full compensation for furnishing all materials and for all preparation, placing, and spreading of the materials, and for all labor, equipment, tools, and incidentals necessary to complete the item.

Payment will be made under:

Item T-905-5.1	Topsoil (Obtained on Site or Removed from Stockpile - per cubic yard (cubic meter)
----------------	--

REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

ASTM International (ASTM)

ASTM C117	Materials Finer than 75 μm (No. 200) Sieve in Mineral Aggregates by Washing
-----------	--

Advisory Circulars (AC)

AC 150/5200-33	Hazardous Wildlife Attractants on or Near Airports
----------------	--

FAA/United States Department of Agriculture

Wildlife Hazard Management at Airports, A Manual for Airport Personnel
--

END OF ITEM T-905

Item T-908

Mulching

DESCRIPTION

908-1.1 This item shall consist of furnishing, hauling, placing, and securing mulch on surfaces indicated on the plans or designated by the RPR.

MATERIALS

908-2.1 Mulch material. Acceptable mulch shall be the materials listed below or any approved locally available material that is similar to those specified. Mulch shall be free from noxious weeds, mold, and other deleterious materials. Mulch materials, which contain matured seed of species that would volunteer and be detrimental to the proposed overseeding, or to surrounding farm land, will not be acceptable. Straw or other mulch material which is fresh and/or excessively brittle, or which is in such an advanced stage of decomposition as to smother or retard the planted grass, will not be acceptable.

a. Hay. Hay will not be allowed.

b. Straw. Straw will not be allowed.

c. Hay mulch containing seed. Hay mulch will not be allowed.

d. Manufactured mulch. Cellulose-fiber or wood-pulp mulch shall be products commercially available for use in spray applications.

e. Asphalt binder. Asphalt binder material shall conform to the requirements of ASTM D977, Type SS-1 or RS-1.

908-2.2 Inspection. The RPR shall be notified of sources and quantities of mulch materials available and the Contractor shall furnish him with representative samples of the materials to be used 30 days before delivery to the project. These samples may be used as standards with the approval of the RPR and any materials brought on the site that do not meet these standards shall be rejected.

CONSTRUCTION METHODS

908-3.1 Mulching. Before spreading mulch, all large clods, stumps, stones, brush, roots, and other foreign material shall be removed from the area to be mulched. Mulch shall be applied immediately after seeding. The spreading of the mulch may be by hand methods, blower, or other mechanical methods, provided a uniform covering is obtained.

Mulch material shall be furnished, hauled, and evenly applied on the area shown on the plans or designated by the RPR. Straw or hay shall be spread over the surface to a uniform thickness at the rate of 2 to 3 tons per acre (1800 - 2700 kg per acre) to provide a loose depth of not less than 1-1/2 inches (38 cm) nor more than 3 inches (75 mm). Other organic material shall be spread at the rate directed by the RPR. Mulch may be blown on the slopes and the use of cutters in the equipment for this purpose will be permitted to the extent that at least 95% of the mulch in place on the slope shall be 6 inches (150 mm) or more in length. When mulches applied by the blowing method are cut, the loose depth in place shall be not less than one inch (25 mm) nor more than 2 inches (50 mm).

908-3.2 Securing mulch. The mulch shall be held in place by light discing, a very thin covering of topsoil, pins, stakes, wire mesh, asphalt binder, or other adhesive material approved by the RPR. Where mulches have been secured by either of the asphalt binder methods, it will not be permissible to walk on the slopes after the binder has been applied. When an application of asphalt binder material is used to secure the mulch, the Contractor must take every precaution to guard against damaging or disfiguring structures or property on or adjacent to the areas worked and will be held responsible for any such damage resulting from the operation.

If the “peg and string” method is used, the mulch shall be secured by the use of stakes or wire pins driven into the ground on 5-foot (1.5-m) centers or less. Binder twine shall be strung between adjacent stakes in straight lines and crisscrossed diagonally over the mulch, after which the stakes shall be firmly driven nearly flush to the ground to draw the twine down tight onto the mulch.

908-3.3 Care and repair.

a. The Contractor shall care for the mulched areas until final acceptance of the project. Care shall consist of providing protection against traffic or other use by placing warning signs, as approved by the RPR, and erecting any barricades that may be shown on the plans before or immediately after mulching has been completed on the designated areas.

b. The Contractor shall be required to repair or replace any mulch that is defective or becomes damaged until the project is finally accepted. When, in the judgment of the RPR, such defects or damages are the result of poor workmanship or failure to meet the requirements of the specifications, the cost of the necessary repairs or replacement shall be borne by the Contractor.

c. If the “asphalt spray” method is used, all mulched surfaces shall be sprayed with asphalt binder material so that the surface has a uniform appearance. The binder shall be uniformly applied to the mulch at the rate of approximately 8 gallons (32 liters) per 1,000 square feet (100 sq m), or as directed by the RPR, with a minimum of 6 gallons (24 liters) and a maximum of 10 gallons (40 liters) per 1,000 square feet (100 sq m) depending on the type of mulch and the effectiveness of the binder securing it. Asphalt binder material may be sprayed on the mulched slope areas from either the top or the bottom of the slope. An approved spray nozzle shall be used. The nozzle shall be operated at a distance of not less than 4 feet (1.2 m) from the surface of the mulch and uniform distribution of the asphalt material shall be required. A pump or an air compressor of adequate capacity shall be used to ensure uniform distribution of the asphalt material.

d. If the “asphalt mix” method is used, the mulch shall be applied by blowing, and the asphalt binder material shall be sprayed into the mulch as it leaves the blower. The binder shall be uniformly applied to the mulch at the rate of approximately 8 gallons (32 liters) per 1,000 square feet (100 sq m) or as directed by the RPR, with a minimum of 6 gallons (24 liters) and a maximum of 10 gallons (40 liters) per 1,000 square feet (100 sq m) depending on the type of mulch and the effectiveness of the binder securing it.

METHOD OF MEASUREMENT

908-4.1 Mulching shall be measured in square yards (square meters) on the basis of the actual surface area acceptably mulched.

BASIS OF PAYMENT

908-5.1 Payment will be made at the contract unit price per square yard (square meter) for mulching. The price shall be full compensation for furnishing all materials and for placing and

anchoring the materials, and for all labor, equipment, tools, and incidentals necessary to complete the item.

Payment will be made under:

Item T-908-5.1 Mulching - per acre

REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

ASTM International (ASTM)

ASTM D977 Standard Specification for Emulsified Asphalt

Advisory Circulars (AC)

AC 150/5200-33 Hazardous Wildlife Attractants on or Near Airports

FAA/United States Department of Agriculture

Wildlife Hazard Management at Airports, A Manual for Airport Personnel

END OF ITEM T-908

SECTION 315 – ASPHALT CONCRETE PLACEMENT

315.01 – Description

This work shall consist of constructing one or more courses of asphalt concrete on a prepared foundation in accordance with these Specifications and within the specified tolerances for the lines, grades, thicknesses, and cross sections shown on the plans or established by the Engineer. At the Contractor's option, the asphalt concrete mix may be produced using a warm-mix additive or warm-mix process approved by the Department. When used, the temperature placement limitations for Warm Mix Asphalt (WMA) shall apply.

This work shall also consist of constructing asphalt concrete curb and rumble strips in accordance with these Specifications, plan details, and the Standard Drawings.

315.02 – Materials

- (a) **Asphalt concrete** shall conform to Section 211. The Contractor shall alter the design if SUPERPAVE design densities begin to exceed 98 percent of the theoretical maximum density during construction.
- (b) **Asphalt for Tack Coat** shall conform to Section 210 and shall be applied according to Section 310.
- (c) **Asphalt for prime coat** shall conform to Section 210 and shall be applied according to Section 311.
- (d) **Curb backup material** shall be asphalt concrete conforming to any surface or intermediate mixture listed in Table II-13 and Table II-14.
- (e) **Liquid asphalt coating (emulsion) for rumble strips** shall conform to Section 210. The Contractor shall use CSS-1h or CQS-1h asphalt emulsions for centerline rumble strips. The CSS-1h or CQS-1h liquid asphalt may be diluted by up to 30 percent at the emulsion manufacturer's facility.

315.03 – Equipment

- (a) **Hauling Equipment:** Trucks used for hauling asphalt mixtures shall have structurally sound, tight, clean, smooth metal or other non-absorptive, inert material bodies equipped with a positive locking metal tailgate. Surfaces in contact with asphalt mixtures shall be given a thin coat of aliphatic hydrocarbon invert emulsion release agent (nonpuddling), a lime solution, or other release agent materials on the Materials Division's Approved Products List No. 8. The beds of dump trucks shall be raised to remove excess release agent prior to loading except when a nonpuddling release agent is used. Only a nonpuddling agent shall be used in truck beds that do not dump. Each Contractor truck used for hauling asphalt shall be equipped with a tarpaulin or other type of cover acceptable to the Engineer that shall protect the mixture from moisture and foreign matter and prevent the rapid loss of heat during transportation.

- (b) **Asphalt Pavers:** The asphalt paver shall be designed and recommended by the manufacturer for the type of asphalt to be placed and shall be operated in accordance with the manufacturer's recommendations. The Contractor shall readily have and maintain on the project site any written recommendations from the manufacturer of the mix relative to handling and placing of the mixture. In the absence of the manufacturer's recommendations, the recommendations of the National Asphalt Pavement Association shall be followed. The paver shall be capable of producing a smooth uniform texture, dense joints, and a smooth riding surface even when screed extensions are used.
- (c) **Rollers:** Rollers shall be steel wheel, static or vibratory, or pneumatic tire rollers and shall be capable of reversing without backlash. The Contractor shall operate rollers at speeds slow enough to avoid displacement of the mixture. The number and weight of rollers shall be sufficient to compact the mixture to the required density while it is still in a workable condition. The Engineer will not allow the use of equipment that results in excessive crushing of aggregate or marring of the pavement surface. If the Contractor's equipment mars the surface of the pavement during construction to the extent that imperfections cannot satisfactorily be corrected or produces permanent blemishes, the Engineer will require the Contractor to discontinue the use of that particular equipment and replace that equipment with satisfactory units.
- (d) **Rotary Saw:** The Contractor shall supply a gasoline-powered rotary saw with a carbide blade for cutting test samples from the pavement. The Contractor shall provide gasoline, oil, additional carbide blades, and maintenance for the rotary saw. The Contractor shall cool the pavement prior to sawing the sample. As an alternative, the Contractor may furnish the necessary equipment for coring and testing 4-inch core samples in accordance with VTM-22.
- (e) **Material Transfer Vehicle (MTV):** When required in the Contract, the Contractor shall furnish a self-propelled MTV storage unit capable of receiving material from trucks, storing the material, and transferring the material from the unit to a paver hopper insert via a conveyor system. The paver hopper insert and unit shall have a combined minimum storage capacity of 15 tons. The storage unit or paver hopper insert must be able to remix the material in order to produce a uniform, non-segregated mix having a uniform temperature prior to placing the asphalt material on the roadway surface.

315.04 – Placement Limitations

The Contractor shall not place asphalt concrete mixtures when weather or surface conditions are such that the material cannot be properly handled, finished, or compacted. The surface upon which asphalt mixtures is to be placed shall be free of standing water, dirt, and mud and the base temperature shall conform to the following:

(a) Asphalt Concrete Produced with Warm Mix Asphalt Additives or Processes:

The Contractor shall note on the delivery ticket that the load is Warm Mix Asphalt.

1. **When the base temperature is 40 degrees F and above:** The Engineer will permit lay-down at any temperature below the maximum limits given in Section 211.08.

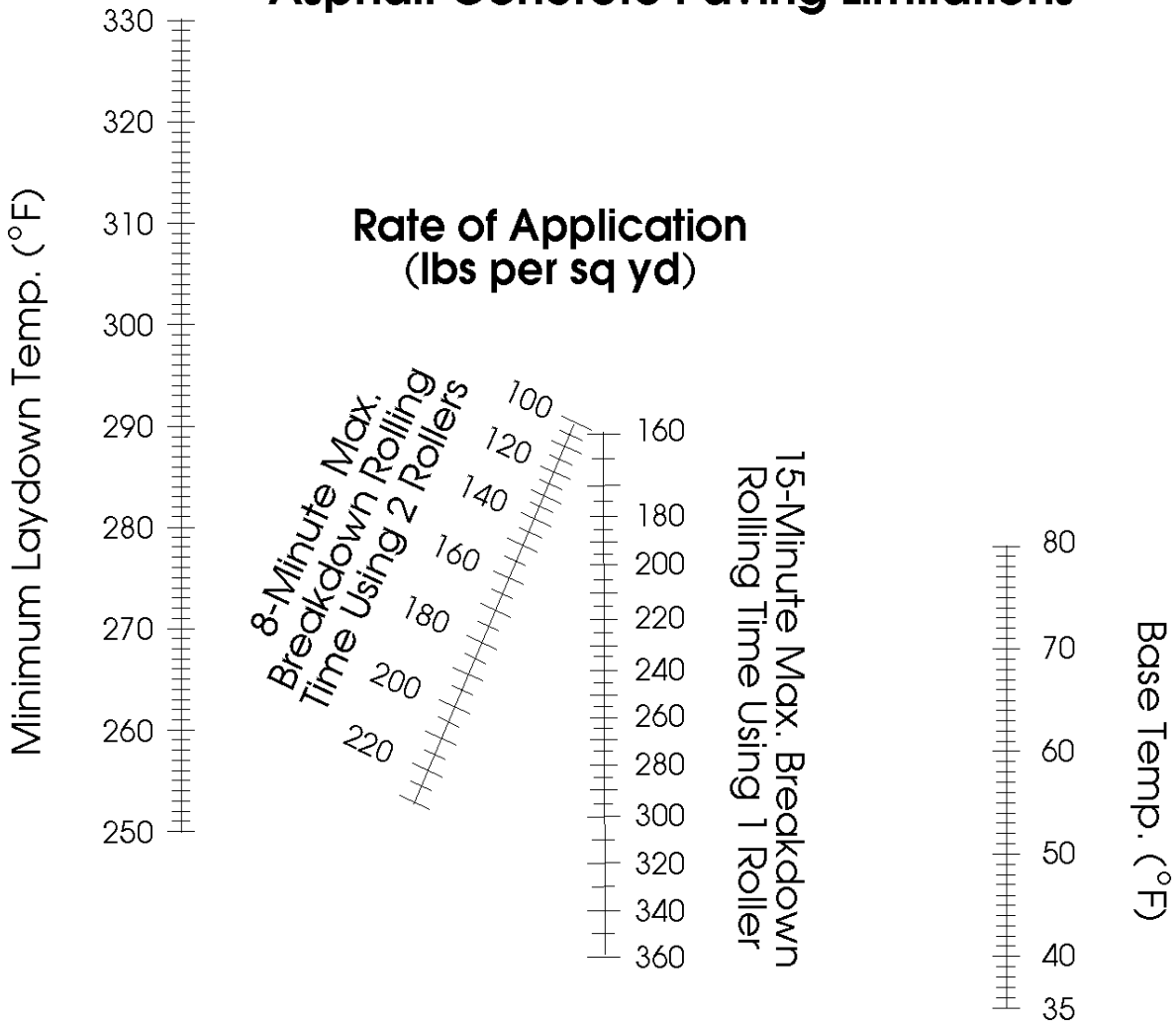
2. **When the mixture temperature is below 200 degrees F:** The Contractor will not be allowed to place the material.

(b) Asphalt Concrete Produced without Warm Mix Asphalt Additives or Processes:

1. **When the base temperature is above 80 degrees F:** The Engineer will allow laydown of the mixture at any temperature conforming to the limits specified in Section 211.
2. **When the base temperature is between 40 degrees F and 80 degrees F:** The Contractor shall use the Nomograph, Table III-2, to determine the minimum laydown temperature of the asphalt concrete mixes. At no time shall the base temperature for base (BM) and intermediate (IM) mixes be less than 40 degrees F. At no time shall the laydown temperature for base (BM) and intermediate (IM) mixes be less than 250 degrees F.

**TABLE III-2
Cold Weather Paving Limitations**

Asphalt Concrete Paving Limitations



The minimum base and laydown temperatures for surface mixes (SM) shall never be less than the following:

PG Binder/Mix Designation	Percentage of Reclaimed Asphalt Pavement (RAP) Added to Mix	Minimum Base Temperature	Minimum Placement Temperature
PG 64S-22 (A)	≤25%	40°F	250°F
PG 64S-22 (A)	>25%	50°F	270°F
PG 64H-22 (D)	≤30%	50°F	270°F
PG 64E-22 (E)	≤15%	50°F	290°F
PG 64S-22 (S)	≤30%	50°F	290°F

- When the laydown temperature is between 301 degrees F and 325 degrees F: The number of compaction rollers shall be the same number as those required for 300 degrees F.

Intermediate and base courses that are placed at rates of application that exceed the application rates shown in Table III-2 shall conform to the requirements for the maximum application rate shown for 8-minute and 15-minute compaction rolling as per number of rollers used.

If the Contractor is unable to complete the compaction rolling within the applicable 8-minute or 15-minute period, the Engineer will either require the placing of the asphalt mixture to cease until sufficient rollers are used or other corrective action be taken to complete the compaction rolling within the specified time period.

The Contractor shall complete compaction rolling prior to the mat cooling down to 175 degrees F. Finish rolling may be performed at a lower mat temperature.

The Contractor shall not place the final asphalt pavement finish course until temporary pavement markings will no longer be required.

315.05 – Procedures

- (a) **Base Course:** The Contractor shall prepare the subgrade or subbase as specified in Section 305. The Contractor shall grade and compact the course to the required profile upon which the pavement is to be placed, including the area that will support the paving equipment.
- (b) **Conditioning Existing Surface:** The surface on which the asphalt concrete is to be placed shall be prepared in accordance with the applicable specifications and shall be graded and compacted to the required profile and cross section.

When specified in the Contract, prior to placement of asphalt concrete, the Contractor shall seal longitudinal and transverse joints and cracks by the application of an approved crack sealing material in accordance with the special provision for “Sealing Cracks in Asphalt Concrete Surfaces or Hydraulic Cement Concrete Pavement.”

- 1. **Priming and Tacking:** The Contractor shall paint contact surfaces of curbing, gutters, manholes, and other structures projecting into or abutting the pavement and cold joints of asphalt with a thick, uniform coating of asphalt prior to placing the asphalt mixture.

The Contractor shall apply a tack or prime coat of asphalt conforming to the applicable requirements of Section 311 or Section 310 and as specified below. Liquid asphalt classified as cutbacks or emulsions shall be applied ahead of the paving operations, and the time interval between applying and placing the paving mixture shall be sufficient to ensure a tacky residue has formed to provide maximum adhesion of the paving mixture to the base. The Contractor shall not place the mixture on tack or prime coats that have been damaged by traffic or contaminated by foreign material. Traffic shall be excluded from such sections.

- a. **Priming aggregate base or subbase:** The Engineer will not require priming with asphalt material on aggregate subbase or base material prior to the placement of asphalt base, intermediate or surface layers unless otherwise specified in the Contract.

- b. **Tacking:** Tack at joints, adjacent to curbs, gutters, or other appurtenances shall be applied with a hand wand or with spray bar at the rate of 0.2 gallon per square yard. At joints, the tack applied by the hand wand or a spray bar shall be 2 feet in width with 4 to 6 inches protruding beyond the joint for the first pass. Tack for the adjacent pass shall completely cover the vertical face of the pavement mat edge so that slight puddling of asphalt occurs at the joint, and extend a minimum of 1 foot into the lane to be paved. Milled faces that are to remain in place shall be tacked in the same way for the adjacent pass. Use of tack at the vertical faces of longitudinal joints will not be required when paving is performed in echelon.

The tack coat shall be eliminated on asphalt saturated (rich) sections or those that have been repaired by the extensive use of asphalt patching mixtures when directed by the Engineer.

Tack shall not be required atop asphalt stabilized open-graded material drainage layers.

Tack shall be applied between the existing asphalt surface and each asphalt course placed thereafter.

2. **Removing depressions and elevating curves:** Where irregularities in the existing surface will result in a course more than 3 inches in thickness after compaction, the Contractor shall bring the surface to a uniform profile by patching with asphalt concrete and thoroughly tamping or rolling the patched area until it conforms with the surrounding surface. The mixture used shall be the same as that specified for the course to be placed.

When the Contractor elects to conduct operations to eliminate depressions, elevate curves, and place the surface course simultaneously, the Contractor shall furnish such additional spreading and compacting equipment as required to maintain the proper interval between the operations.

- (c) **Placing and Finishing:** The Contractor shall not place asphalt concrete until the Engineer approves the surface upon which it is to be placed.

The Contractor's equipment and placement operations shall properly control the pavement width and horizontal alignment. The Contractor shall use an asphalt paver sized to distribute asphalt concrete over the widest pavement width practicable. Wherever practicable, and when the capacity of sustained production and delivery is such that more than one paver can be successfully and continuously operated, pavers shall be used in echelon to place the wearing course in adjacent lanes. Crossovers, as well as areas containing manholes or other obstacles that prohibit the practical use of mechanical spreading and finishing equipment may be constructed using hand tools. However, the Contractor shall exercise care to obtain the required thickness, jointing, compaction, and surface smoothness in such areas.

The longitudinal joint in one layer shall offset that in the layer immediately below by approximately 6 inches or more. The joint in the wearing surface shall be offset 6 inches to 12 inches from the centerline of the pavement if the roadway comprises two traffic lanes. The joint shall be offset approximately 6 inches from the lane lines if the roadway is more than two lanes in width. The longitudinal joint shall be uniform in appearance. If the offset for the

longitudinal joint varies from a straight line more than 2 inches in 50 feet on tangent alignment, or from a true arc more than 2 inches in 50 feet on curved alignment, the Contractor shall seal the joint using a water-proof sealer at no cost to the Department. The Contractor shall recommend a sealant and installation procedure to the Engineer for approval before proceeding. If the offset for the longitudinal joint varies from a straight line more than 3 inches in 50 feet on tangent alignment, or from a true arc more than 3 inches in 50 feet on curved alignment, the Engineer may reject the paving. The Engineer will not require offsetting layers when adjoining lanes are paved in echelon and the rolling of both lanes occurs within 15 minutes after laydown.

The Contractor shall have a certified Asphalt Field Level II Technician present during all paving operations. Immediately after placement and screeding, the surface and edges of each layer shall be inspected by the Asphalt Field Level II Technician to ensure compliance with the asphalt placement requirements and be straightedged to verify uniformity and smoothness. The Asphalt Field Level II Technician shall make any corrections to the placement operations, if necessary, prior to compaction. The finished pavement shall be uniform and smooth.

The Contractor's Asphalt Field Level II Technician shall be present during all density testing.

Asphalt concrete placement shall be as continuous as possible and shall be scheduled such that the interruption occurring at the completion of each day's work shall not detrimentally affect the partially completed work. Material that cannot be spread and finished in daylight shall not be dispatched from the plant unless the Engineer approves the use of artificial lighting. When paving is performed at night, the Contractor shall provide sufficient light to properly perform and thoroughly inspect every phase of the operation. Such phases include cleaning planed surfaces, applying tack, paving, compacting, and testing. Lighting shall be provided and positioned so as to not create a blinding hazard to the traveling public.

The Contractor shall ensure that the roller does not pass over the end of freshly placed material during the compaction of asphalt concrete except when a transverse construction joint is to be formed. Edges of pavement shall be finished true and uniform.

Asphalt concrete SUPERPAVE pavement courses shall be placed in layers not exceeding four times the nominal maximum size aggregate in the asphalt mixture. The maximum thickness may be reduced if the mixture cannot be adequately placed in a single lift and compacted to the required uniform density and smoothness. The minimum thickness for a pavement course shall be no less than 2.5 times the nominal maximum size aggregate in the asphalt mixture. Nominal maximum size aggregate for each mix shall be defined as one sieve size larger than the first sieve to retain more than 10 percent aggregate as shown in the design range specified in Section 211.03, Table II-13. The Contractor may place base courses in irregularly shaped areas of pavement such as transitions, turn lanes, crossovers, and entrances in a single lift.

The Contractor shall square up overlays in excess of 220 pounds per square yard or lanes with a milled depth greater than 2 inches prior to opening to traffic.

The Contractor shall cut drainage outlets through the shoulder at locations the Engineer designates, excluding curb and gutter sections, on the milled roadway areas that are to be opened to traffic. Plan and prosecute the milling operation to avoid trapping water on the

roadway and restore drainage outlets to original grade once paving operations are completed, unless otherwise directed by the Engineer. The cost for cutting and restoring the drainage slots in the roadway shoulder shall be included in the price bid for other items of work.

The Contractor shall plan and prosecute a schedule of operations so that milled roadways shall be overlaid with asphalt concrete as soon as possible. In no instance shall the time lapse exceed 14 days after the milling operations, unless otherwise specified in Section 515 or other provisions in the contract. The Contractor shall keep milled areas of the roadway free of irregularities and obstructions that may create a hazard or annoyance to traffic in accordance with Section 104.

The Contractor shall use a short ski or shoe to match the grade of the newly overlaid adjacent travel lane on primary, interstate, and designated secondary routes. Unless otherwise directed by the Engineer, a 24-foot minimum automatic grade control ski shall be used on asphalt mixtures on divided highways, with the exception of overlays that are less than full width and the first course of asphalt base mixtures over aggregate subbases. Care shall be exercised when working along curb and gutter sections to provide a uniform grade and joint.

The Contractor shall construct the final riding surface to tie into the existing surface by an approved method, which shall include the cutting of a notch into the existing pavement. In addition to notching, the Contractor may use an asphalt mix design containing a fine-graded mix to achieve a smooth transition from the new asphalt concrete overlay to the existing pavement, with the approval of the Engineer. The material shall be of a type to ensure that raveling will not occur. The cost for constructing tie-ins in the asphalt concrete overlay shall be included in the asphalt concrete contract unit price.

Prior to application of tack coat and commencement of paving operations if, in the opinion of the Engineer, the existing pavement surface condition may detrimentally affect or prevent the bond of the new overlay, the Contractor shall clean the existing pavement surface of all accumulated dust, mud, or other debris.

The Contractor shall ensure the surface remains clean until commencement of, and during, paving operations. The cost for cleaning and surface preparation shall be included in the asphalt concrete contract unit price.

The Contractor shall employ a Material Transfer Vehicle (MTV) during the placement of surface mixes (SM) on all Interstate routes. If equipment within the paving train breaks down, paving shall be discontinued once the material on-site has been placed and no more material shall be shipped from the asphalt plant.

When required in the Contract, a MTV shall be used during the placement of designated asphalt mixes on full lane width applications.

- (d) **Compacting:** Immediately after the asphalt mixture is placed, struck off, and surface irregularities are corrected, the mixture shall be thoroughly and uniformly compacted by rolling. Rolling shall be a continuous process, insofar as practicable, and all parts of the pavement shall receive uniform compaction.

The asphalt surface shall be rolled when the mixture is in the proper condition. Rolling shall not cause undue displacement, cracking, or shoving of the placed mixture.

The Contractor shall use the number, weight, and type of rollers sufficient to obtain the required compaction while the mixture is in a workable condition. The sequence of rolling operations and the selection of roller types shall provide the specified pavement density.

Rolling shall begin at the sides of the placement and proceed longitudinally parallel with the center of the pavement, each pass overlapping at least 6 inches, gradually progressing to the crown of the pavement. When abutting a previously placed lane, rolling shall begin at the outside unconfined side and proceed toward the previously placed lane. On superelevated curves, rolling shall begin at the low side and proceed to the high side by overlapping longitudinal passes parallel with the centerline.

The Contractor shall correct displacements occurring as a result of reversing the direction of a roller or other causes at once by the use of rakes or lutes and the addition of fresh mixture when required. Care shall be taken in rolling not to displace or distort the line and grade of the edges of the asphalt mixture. Edges of finished asphalt pavement surfaces shall be true curves or tangents. The Contractor shall correct irregularities in such areas.

The Contractor shall keep the wheels/drums of the rollers properly moistened with water, water mixed with a very small quantity of detergent or other Engineer approved material to prevent adhesion of the mixture to the rollers. The Engineer will not allow the use or presence of excess liquid on the rollers.

The Contractor shall thoroughly compact the mixture along forms, curbs, headers, walls, and other places not accessible to rollers with hot hand tampers, smoothing irons, or mechanical tampers. On depressed areas, a trench roller or cleated compression strips may be used under the roller to ensure proper compression.

The Contractor shall protect the surface of the compacted course until the material has cooled sufficiently to support normal traffic without marring.

(e) **Density** shall be determined in accordance with the following:

1. The Contractor shall perform roller pattern and control strip density testing on surface, intermediate, and base courses in accordance with VTM-76. The Contractor shall have a certified Asphalt Field Technician II perform all density testing.

Density shall be determined with a thin-lift nuclear gauge conforming VTM-81 or from the testing of plugs/cores taken from the roadway where the mixture was placed. Density test locations shall be marked and labeled in accordance with VTM-76. When acceptance testing is performed with a nuclear gauge, the Contractor shall have had the gauge calibrated within the previous 12 months by an approved calibration service. In addition, the Contractor shall maintain documentation of such calibration service for the 12-month period from the date of the calibration service. The required density of the compacted course shall not be less than 98.0 percent or more than 102.0 percent of the target control strip density.

Nuclear density roller pattern and control strip density testing shall be performed on asphalt concrete overlays placed directly on surface treatment roadways and when overlays are placed at an application rate less than 125 pounds per square yard, based on 110 pounds per square yard per inch, on any surface. In these situations, the Engineer will not require sawed plugs or core samples and the minimum control strip densities as specified in Table III-3 will not be required. The required density of the compacted course shall not be less than 98.0 percent or more than 102.0 percent of the target control strip.

**TABLE III-3
Density Requirements**

Mixture Type	Min. Control Strip Density (%)¹
SM-9.5A, 12.5A	92.5
SM-9.5D, 12.5D	92.2
SM-9.5E, 12.5E	92.2
IM-19.0A, IM-19.0D, IM-19.0E	92.2
BM-25.0A, BM-25.0D	92.2

¹The control strip density requirement is the percentage of theoretical maximum density of the job-mix formula by SUPERPAVE mix design or as established by the Engineer based on two or more production maximum theoretical density tests.

The Engineer will divide the project into “control strips” and “test sections” for the purpose of defining areas represented by each series of tests.

- a. **Control Strip:** Control strips shall be constructed in accordance with these specifications and VTM-76.

The term *control strip density* is defined as the average of 10 determinations selected at stratified random locations within the control strip.

The Contractor shall construct one control strip at the beginning of work on each roadway and shoulder course and on each lift of each course. The Engineer will require the Contractor to construct an additional control strip whenever a change is made in the type or source of materials; whenever a significant change occurs in the composition of the material being placed from the same source; or when there is a failing test strip. During the evaluation of the initial control strip, the Contractor may continue paving operations, however, paving and production shall be discontinued during construction and evaluation of any additional control strips. If two consecutive control strips fail, subsequent paving operations shall not begin or shall cease until the Contractor recommends correctives actions to the Engineer and the Engineer approves the Contractor proceeding with the corrective action(s). If the Contractor and the Engineer mutually agree that the required density cannot be obtained because of the condition of the existing pavement structure, the target control strip density shall be determined

from the roller pattern that achieves the optimum density and this target control strip density shall be used on the remainder of the roadway that exhibits similar pavement conditions.

Either the Engineer or the Contractor may initiate the construction of an additional control strip at any time.

The length of the control strip shall be approximately 300 feet and the width shall not be less than 6 feet. On the first day of construction or beginning of a new course, the control strip shall be started between 500 and 1,000 feet from the beginning of the paving operation. The Contractor shall construct the control strip using the same paving, rolling equipment, procedures, and thickness as shall be used for the remainder of the course being placed.

The Contractor's Asphalt Field Level II Technician shall take one reading at each of 10 stratified random locations. No determination shall be made within 12 inches of the edge of any application width for surface and intermediate mixes or within 18 inches of the edge of any application width for base mixes. The average of these 10 determinations shall be the control strip density recorded to the nearest 0.1 pound per cubic foot. The minimum control strip density shall be determined in accordance with VTM-76.

The control strip shall be considered a lot. If the control strip density conforms to the requirements specified in Table III-3, the Engineer will consider the control strip to be acceptable and the control strip density shall become the target control strip density. If the density does not conform to the requirements specified in Table III-3, the tonnage placed in the control strip and any subsequent paving prior to construction of another control strip will be paid for in accordance with Table III-4 on the basis of the percentage of the Table III-3 value achieved. The Contractor shall take corrective action(s) to comply with the density requirement specified in Table III-3.

TABLE III-4	
Payment Schedule for Lot Densities	
% of Target Control Strip Density	% of Payment
Greater than 102.0	95
98.0 to 102.0	100
97.0 to less than 98.0	95
96.0 to less than 97.0	90
Less than 96.0	75

- b. **Test section (lot):** For the purposes of determining acceptance, the Engineer will consider each day's production as a lot unless the paving length is less than 3,000 linear feet or greater than 7,500 linear feet. When paving is less than 3,000 feet, that day's production will be combined with the previous day's production or added to the next day's production to create a lot as described below.

The standard size of a lot will be 5,000 linear feet (five 1,000 foot sublots) of any pass 6 feet or greater made by the paving train for the thickness of the course. If the Engineer approves, the lot size may be increased to 7,500 linear foot lots with five 1,500 foot sublots when the Contractor's normal daily production exceeds 7,000 feet. Pavers traveling in echelon will be considered as two passes. When a partial lot occurs at the end of a day's production or upon completion of the project, the lot size will be redefined as follows:

- If the partial lot contains one or two sublots, the sublots will be added to the previous lot.
- If the partial lot contains three or four sublots, the partial lot will be redefined to be an entire lot.

The Contractor shall test each lot for density by taking a nuclear density gauge reading from two random test sites selected by the Engineer within each subplot. When saw cores are used to determine acceptance a single test site will be selected by the Engineer. Test sites will not be located within 12 inches of the edge of any application width for surface and intermediate mixes or within 18 inches of the edge of any application width for base mixes.

The Engineer will compare the average of the subplot density measurements to the target nuclear density, or for cores, to the target percent of theoretical maximum density achieved on the control strip to determine the acceptability of the lot. The Engineer will not allow the Contractor to provide additional compaction to raise the average once the average density of the lot has been determined. The Contractor shall immediately notify the Engineer and institute corrective action if two consecutive sublots produce density results less than 98 percent or more than 102 percent of the target control strip density.

Longitudinal joints shall also be tested for density using a nuclear density gauge at each test site in the subplot. For surface and intermediate mixes, the edge of the gauge shall be placed within 4 inches of the joint. For base mixes, the edge of the gauge shall be placed within 6 inches of the joint. The Contractor shall not place the gauge atop the joint. The joint density value shall be recorded. The Contractor shall report to the Engineer and institute corrective action if a single longitudinal joint density reading is less than 95 percent of the target control strip density. The Engineer will not use the values obtained from the joint readings in payment calculation. The Contractor shall furnish the test data developed during the day's paving to the Engineer by the end of that day's operations.

When sawn cores are used for density acceptance, the Contractor shall perform acceptance testing for density for each subplot by obtaining one sawed 4 inch by 4 inch specimen, or one 4-inch-diameter core, at a single random test site selected by the Engineer.

- The sub-lot site shall be marked as described in VTM-76.

- The bulk specific gravity of the cores shall be determined in accordance with VTM-6.
- The density of the cores shall be determined in accordance with VTM-22.

Cores or plugs shall be bulked in the presence of the Engineer. The Department may have the cores or plugs bulked on the project site. The Contractor shall number subplot test sites sequentially per lot, mark these on the pavement, fill them with the paving mixture, and compact them prior to the completion of each day of production.

The tonnage of each lot will be based on the lot's width and length and the mixture application rate as designated in the Contract or as revised by the Engineer. Payment will be made in accordance with Table III-4.

The Engineer may perform lot density verification testing at any time on any project. Lot density verification will be performed by testing plugs. The Contractor shall be responsible for taking plugs for testing. The Engineer will perform verification testing of the plugs.

Surface, Intermediate, and Base mixes:

The Contractor shall take two plugs per Verification, Sampling and Testing (VST) lot at locations selected by the Engineer. If the Engineer determines the density of the plugs does not conform to the requirements for the lot in question or the same payment percentage determined by the Contractor's testing for that lot, then the Contractor may request the referee procedure to be invoked. The Contractor shall take one additional plug from the remaining sublots. Payment for that lot, based on the results of the initial two plugs/cores or referee procedure, will be in accordance with the percentage specified in Table III-4 on the basis of the percentage of the control strip bulk density achieved.

2. **Surface, intermediate, and base courses** not having a sufficient quantity of material to run a roller pattern and control strip, and unique sections defined on the Plans or within the Contract that are 3500 feet or less and at least 6 feet in width shall be compacted to a minimum density of 92.5 percent for surface mixes or 92.2 percent for intermediate and base mixes as determined in accordance with VTM-22. The Contractor shall be responsible for cutting cores or sawing plugs for testing by the Department. One plug or core shall be obtained within the first 500 feet of small quantity paving and every 1000 feet thereafter for testing by the Department. Plug or core locations shall be randomly selected by the Engineer. If the density is determined to be less than the minimum, the Engineer will make payment in accordance with Table III-5.

**TABLE III-5
Payment Schedule for Surface, Intermediate and Base Courses (Not sufficient quantity to perform density roller pattern and control strip)**

% TMD	% of Payment
Greater than or equal to 92.2 ¹ /92.5 ²	100

90.0-92.1 ¹ /92.4 ²	90
88.0-89.9	80
Less than 88.0	75

¹The minimum TMD percentage for Intermediate and Base Mixes

²The minimum TMD percentage for Surface Mixes

Any section in which a mixture (e.g., SM-9.0) is being placed at an application rate of less than 125 pounds per square yard (based on 110 pounds per square yard per inch) that does not have a sufficient quantity of material for a roller pattern and control strip shall be compacted by rolling a minimum of three passes with a minimum 8-ton roller. The Engineer will not require density testing.

For asphalt patching, the minimum density of 91.5 percent of the maximum theoretical density will be determined in accordance with VTM-22. The Contractor is responsible for cutting cores or sawing plugs. One set of cores or plugs shall be obtained within the first 20 tons of patching material and every 100 tons thereafter for testing by the Contractor or the Department. The Engineer will randomly select plug or core locations. If the density is less than the 91.5 percent, payment will be made on the tonnage within the 20 or 100 ton lot in accordance with Table III-6.

TABLE III-6
Payment Schedule for Surface, Intermediate and Base Courses
(Asphalt Patching)

% TMD	% of Payment
Greater than or equal to 91.5	100
90.2-91.4	95
88.3-90.1	90
Less than or equal to 88.2	75

- (f) **Joints:** Transverse joints shall be formed by cutting back on the previous run to expose the full depth of the course. A coat of asphalt shall be applied to contact surfaces of transverse joints just before additional mixture is placed against the previously rolled material.

Joints adjacent to curbs, gutters, or adjoining pavement shall be formed by hand placing sufficient mixture to fill any space left uncovered by the paver. The joint shall then be set up with rakes or lutes to a height sufficient to receive full compression under the rollers.

- (g) **Rumble Strips:** This work shall consist of constructing rumble strips or rumble stripes on mainline shoulders of highways by cutting concave depressions into existing asphalt concrete surfaces as shown on the Standards Drawings and as directed by the Engineer. Rumble stripes are defined as edgeline or centerline rumble strips with permanent longitudinal pavement markings subsequently installed within the rumble strip grooves.

Rumble strips and rumble stripes shall be installed in accordance with the RS-Series Standard Drawings. The Contractor shall demonstrate to the Engineer the ability to achieve the desired surface regarding alignment, consistency, and conformity with these Specifications and the Standard Drawings prior to beginning production work on mainline

shoulders or centerlines. The test site shall be approximately 25 feet longitudinally at a location mutually agreed upon by the Contractor and Engineer.

Rumble strips and rumble stripes shall be coated with liquid asphalt coating (emulsion) when the rumble strips or rumble stripes are being cut into an existing asphalt surface (i.e. more than one year since placement); when new rumble strips or rumble stripes are being cut into the pavement surface in conjunction with a surface treatment, latex emulsion, or slurry seal pavement operation; or when the proposed plant mix surface is less than one inch deep.

Liquid asphalt coating (emulsion) shall not be used when rumble strips or rumble stripes are being cut into new pavement, or being cut in conjunction with plant mix paving operations where the proposed plant mix surface is one inch or greater in depth.

When liquid asphalt coating (emulsion) is required, the Contractor shall coat the entire rumble strip area with the liquid asphalt coating (emulsion) using a pressure distributor following the cutting and cleaning of the depressions of waste material. For rumble strips installed on the shoulder, the approximate application rate shall be 0.1 gallons per square yard. When the rumble strip is installed along the centerline, the approximate application rate shall be 0.05 gallons per square yard. The application temperature shall be between 160 degrees F and 180 degrees F. For shoulder rumble strips only, overspray shall not extend more than 2 inches beyond the width of the cut depressions and shall not come in contact with pavement markings.

Pavement markings for rumble stripes shall be applied after the grooves have been cut. The grooves shall be thoroughly cleaned and the surface prepared prior to pavement marking application, in accordance with the Standard Drawings and Section 704 of the Specifications. Overspray of pavement marking materials shall not extend more than one inch beyond the lateral position of the pavement marking line shown in the RS-Series Standard Drawings.

Rumble strips shall not be installed on shoulders of bridge decks, in acceleration or deceleration lanes, on surface drainage structures, or in other areas identified by the Engineer.

Waste material resulting from the operation shall be removed from the paved surface and shall not be disposed of where waterways may be at risk of contamination.

- (h) **Saw-Cut Asphalt Pavement:** This work shall consist of saw-cutting the existing asphalt pavement to a depth as shown on the plans or as directed by the Engineer.

315.06 – Pavement Samples

The Contractor shall cut samples from the compacted pavement for depth and density testing. Samples shall be taken for the full depth of the course at the locations selected by the Engineer. The removed pavement shall be replaced with new mixture and refinished. No additional compensation will be allowed for furnishing test samples and reconstructing areas from which they were taken.

315.07—Pavement Tolerances

- (a) **Surface Tolerance:** The Engineer will test the pavement surface by using a 10-foot straight-edge. The variation of the surface from the testing edge of the straightedge between any two contacts with the surface shall not be more than 1/4 inch. The Contractor shall correct humps and depressions exceeding the specified tolerance or the defective work shall be removed and replaced with new material.
- (b) **Finished Grade Tolerance:** Finished grade elevations shall be within ± 0.04 foot of the elevations indicated in the plans after placement of the final pavement layer unless otherwise specified, provided the actual cross slope does not vary more than 0.20 percent from the design cross slope indicated in the plans, and the plan depth thickness conforms to the thickness tolerances specified herein.

If the Engineer determines either the finished grade elevations or cross slope exceed the specified tolerances, the Contractor shall submit a corrective action plan to the Engineer for approval.

- (c) **Thickness Tolerance:** The thickness of the base course will be determined by the measurement of cores as described in VTM-32.

Acceptance of asphalt concrete base course for depth will be based on the mean result of measurements of samples taken from each lot of material placed. A lot of material is defined as the quantity being tested for acceptance except that the maximum lot size will be 1 mile of 24-foot-width base course.

A lot will be considered acceptable for depth if the mean result of the tests is within the following tolerance of the plan depth for the number of tests taken:

Plan Depth	1 test	2 tests	3 tests	4 tests
$\leq 4''$	0.6''	0.5''	0.4''	0.3''
$>4'' \leq 8''$	0.9''	0.7''	0.5''	0.4''
$>8'' \leq 12''$	1''	0.9''	0.7''	0.5''
$>12''$	1.2''	1''	0.8''	0.6''

If an individual depth test exceeds the one test tolerance for the specified plan depth, the Engineer will exclude that portion of the lot represented by the test from the lot. If an individual test result indicates that the depth of material represented by the test is more than the tolerance for one test, the Contractor will not be paid for that material in excess of the tolerance throughout the length and width represented by the test. If an individual test result indicates that the depth of the material represented by the test is deficient by more than the one test tolerance for the plan depth, the Contractor shall correct the base course represented by the test as specified hereinafter.

If the mean depth, based on two or more tests, of a lot of material is excessive (more than the plan depth specified in the contract), the Engineer will not pay the Contractor for any material in excess of the tolerance throughout the length and width of the lots represented by the tests.

If the mean depth, based on two or more tests, of a lot of material is deficient (less than the plan depth specified in the contract) by more than the allowable tolerance, the Contractor will be paid for the quantity of material that has been placed in the lot. Any required corrective action will be determined by the Engineer.

For excessive depth base courses, the rate of deduction from the tonnage allowed for payment as base course will be calculated at a weight of 115 pounds per square yard per inch of depth in excess of the tolerance. For sections of base course that are deficient in depth by more than the one test tolerance and less than two and half times the one test tolerance, the Contractor shall furnish and place material specified for the subsequent course to bring the base course depth within the tolerance. This material will be measured on the basis of tonnage actually placed, determined from weigh tickets, and will be paid for at the contract unit price for the base course material. Such material shall be placed in a separate course. If the deficiency is more than two and half times the one test tolerance, the Contractor shall furnish and place base course material to bring the base course thickness within the tolerance. Corrections for deficient base course depth shall be made in a manner to provide a finished pavement that is smooth and uniform. Sections requiring significant grade adjustments which have been previously identified and documented by the Engineer as being outside of the control of the Contractor will be exempt from deduction or corrective action.

When the Contract provides for the construction or reconstruction of the entire pavement structure, the surface and intermediate courses shall be placed at the rate of application shown on the plans within an allowable tolerance of ± 5 percent of the specified application rate for application rates of 100 pounds per square yard or greater and within 5 pounds per square yard for application rates of less than 100 pounds per square yard. The Engineer will deduct the amount of material exceeding the allowable tolerance from the quantities eligible for payment.

When the Contract provides for the placement of surface or intermediate courses over existing pavement, over pavements constructed between combination curb and gutter, or in the construction or reconstruction of shoulders, such courses shall be placed at the approximate rate of application as shown on the plans. However, the specified rate of application shall be altered where necessary to produce the required riding quality.

315.08 – Measurement and Payment

Asphalt concrete base will be measured in tons and will be paid for at the contract unit price per ton. This price shall include preparing and shaping the subgrade or subbase, constructing and finishing shoulders and ditches, and removing and replacing unstable subgrade or subbase.

Asphalt concrete will be measured in tons and will be paid for at the contract unit price per ton. Net weight information shall be furnished with each load of material delivered in accordance with Section 211. Batch weights will not be permitted as a method of measurement unless the Contractor's plant is equipped in accordance with Section 211, in which case the cumulative weight of the batches will be used for payment.

Asphalt used in the mixtures, when a pay item, will be measured in tons in accordance with Section 109.01 except that transporting vehicles shall be tare weighed prior to each load. The

weight will be adjusted in accordance with the percentage of asphalt indicated by laboratory extractions.

Tack coat, when a pay item, will be measured and paid for in accordance with Section 310 of the Specifications. When not a pay item, it shall be included in the price for other appropriate pay items.

Asphalt curb backup material will be measured in tons and will be paid for at the contract unit price per ton. This price shall include placing, tamping, and compacting.

Liquid asphalt cement, when a pay item, will be measured in tons and will be paid for at the contract unit price per ton.

Material Transfer Vehicle (MTV), when required in the Contract, will not be measured for separate payment. The cost for furnishing and operating the MTV shall be included in the contract unit prices of other appropriate items.

Warm Mix Asphalt (WMA) additive or process will not be measured for separate payment, the cost of which, shall be included in the contract unit prices of other appropriate items.

Rumble strips will be measured in linear feet and will be paid for at the contract unit price per linear foot of mainline pavement or shoulder where the rumble strips are actually placed and accepted, excluding the test site. This distance will be measured longitudinally along the center line of pavement (mainline) or edge of pavement (shoulders) with deductions for bridge decks, acceleration/deceleration lanes, surface drainage structures, and other sections where the rumble strips were not installed. This price shall include installing, cleaning up debris and disposing of waste material. The test site will not be measured for payment but shall be included in the unit price for rumble strip.

Liquid asphalt coating (rumble strips) will be measured in square yards and will be paid for at the contract unit price per square yard as described herein. This price shall include cleaning rumble strips prior to application of the coating and furnishing and applying coating as specified herein.

Saw-cut asphalt concrete pavement will be measured in linear feet for the depth specified and will be paid for at the contract unit price per linear foot, which price shall be full compensation for saw-cutting the asphalt pavement to the depth specified, cleaning up debris and disposal of waste material.

These prices for asphalt shall also include heat stabilization additive(s), furnishing samples, and maintaining traffic.

Patching will be paid for at the contract unit price for the various items used unless a reconditioning item is included in the Contract.

Payment will be made under:

Pay Item	Pay Unit
Asphalt concrete base course (Type)	Ton

Asphalt concrete (Type) (Class)	Ton
Asphalt concrete curb backup material	Ton
Liquid asphalt cement	Ton
Rumble strip (Asphalt)	Linear foot
Liquid asphalt coating (Rumble strips)	Square yard
Saw-cut asphalt concrete (depth)	Linear foot

SECTION 504 – SIDEWALKS, STEPS, AND HANDRAILS

504.01 – Description

This work shall consist of constructing sidewalks, steps, handrails on steps or walls, and furnishing and installing detectable warning surfaces in accordance with the VDOT Road and Bridge Standards, these specifications and in conformity to the lines and grades shown on the plans or as established by the Engineer.

504.02 – Materials

- (a) **Concrete** shall be Class A3 conforming to Section 217.
- (b) **Reinforcing steel** shall conform to Section 223.
- (c) **Curing materials** shall conform to Section 220.
- (d) **Preformed joint filler** shall conform to Section 212. Material shall be approximately 1/2 inch in thickness and shall have a width and depth equal to those of the structure.
- (e) Asphalt concrete shall conform to Section 211.
- (f) **Rails and posts** shall be galvanized steel pipe conforming to Section 232.02(c)4.b. Rails shall be of standard weight, and posts shall be extra strength pipe.
- (g) **Geotextile drainage fabric** shall conform to Section 245.
- (h) **Grounding materials** shall conform to Section 238.
- (i) **CG-12 detectable warning surfaces** shall conform to the following:
 - 1. The requirements of this section for hydraulic cement concrete sidewalk except as follows:

Permanent, durable materials suitable for heavy traffic outdoor areas or concrete pavers approved by the Department may be used to construct the detectable warning surfaces where called for on the Plans or elsewhere in the Contract. Concrete paver units shall conform to ASTM C936 and the lines, grades, details and requirements shown in the plans. Other durable materials suitable for outdoor exposure shall be in accordance with Department approved manufacturer's design and specification requirements.
 - 2. Products not on the VDOT Materials Division Approved Product List 72 shall be submitted to the VDOT Location and Design Division Standards & Special Design Section and the appropriate District Materials Engineer for Department review, evaluation and approval prior to use.

All detectable warning surfaces shall meet the ADA Standards as set forth by the United States Access Board.

The color of the detectable warning surface shall be “safety yellow” unless otherwise noted in the plans or directed by the Engineer.

When visual contrast other than “safety yellow” is specified in the Plans or Contract, the detectable warning surfaces shall contrast visually with adjacent walking surfaces either light-on-dark, or dark-on-light. The Engineer must verify and approve the visual contrast of the proposed warning surface prior to installation.

504.03 – Procedures

- (a) **Sidewalks:** The Contractor shall excavate, shape and compact the earthen foundation to a firm, even surface.

Unsuitable material shall be removed and replaced with Department approved material as directed by the Engineer.

When geotextile drainage fabric is required, the Contractor shall clear the designated area of debris prior to fabric installation. Large holes shall be filled with sandy, coarse material, and sharp contours and rises shall be leveled. Adjacent strips of geotextile drainage fabric shall be overlapped at least 12 inches. If fabric is torn or punctured, the Contractor shall repair it at the Contractor’s expense with the same type of fabric by installing a patch having an overlap of at least 12 inches in all dimensions over the damaged area.

Forms shall be straight, free from warp, extend the full depth of the proposed concrete and of sufficient strength to resist the pressure of the newly placed concrete without dislodging or springing. Forms shall be braced and stacked so that they will remain in true horizontal and vertical alignment until their removal. Where practicable, the Contractor shall endeavor to place forms at least 100 feet in advance of concrete placement. Forms shall be cleaned of foreign matter, repaired if necessary and coated with a releasing agent such as a Department approved oil or form-coating material or thoroughly wetted with water immediately before concrete placement.

1. **Hydraulic cement concrete sidewalk:** The Contractor shall thoroughly moisten the foundation immediately prior to concrete placement. Concrete shall be placed in forms by methods that will prevent segregation of the mix. Concrete shall be spread full depth and width and brought to grade by screeding and straightedging. Concrete shall be spaded adjacent to forms to prevent a honeycomb appearance in the finished work. The surface shall be smoothed with a wooden float to produce a surface free from irregularities. The final finish shall be obtained with an approved hand float that will produce a uniform surface texture. The Contractor may use light metal marking rollers or light brooming to hide trowel marks. Outside edges of the sidewalk slab and joints shall be rounded with an edging tool having a radius of 1/4 inch.

The Contractor shall construct transverse expansion joints at intervals of approximately 100 feet, except for closures. Slabs shall be at least 3 feet long. Slabs shall be separated by the installation of transverse preformed joint filler, 1/2 inch in thickness, which shall extend from the bottom of the slab to approximately 1/4 inch below the top surface of the sidewalk.

The slab between expansion joints shall be divided into sections approximately 5 feet long by transverse control joints formed by a jointing tool, trowel, or another approved means. The Contractor shall also provide transverse control joints when the time period between consecutive concrete placements is more than 45 minutes. Control joints shall extend into concrete at least 1/4 of the depth and shall be approximately 1/8 inch in width. Where slabs are more than 7 feet in width, control joints shall be formed longitudinally to obtain secure uniform blocks that are approximately square. Transverse control joints shall also be installed where the corners of drop inlets project into the sidewalk.

The Contractor shall form construction joints around appurtenances extending into and through the sidewalk. Preformed joint filler 1/4 inch thick shall be installed in these joints except that joint filler shall not be used adjacent to drop inlets. The Contractor shall form and fill the expansion joint with 1/4-inch preformed joint filler no less than 6 feet and no more than 10 feet from drop inlets. Preformed joint filler shall also be installed between concrete sidewalk and any adjacent fixed structure that is not tied to the sidewalk with steel dowels.

Where the sidewalk is constructed in conjunction with adjacent curb, expansion joints in the curb and sidewalk shall coincide. The expansion joint shall coincide where practicable where such construction is adjacent to existing curb.

Where existing or proposed structures are within the limits of the sidewalk area, concrete around them shall be scored in a block approximately 8 inches wider than the maximum dimension of the structure at the sidewalk elevation.

Preformed joint filler shall be securely fastened in place.

The Engineer may drill cores from the completed slab to take depth measurements. Sections showing a deficiency of more than 3/8 inch shall be removed and replaced at the Contractor's expense to the specified depth.

The Contractor shall cure and protect concrete in accordance with Section 316.04 immediately following finishing operations. Sidewalks shall not be opened to pedestrian traffic for the first 5 days. Vehicular traffic shall be excluded for the first 14 days or until the minimum design compressive strength is attained, whichever is the lesser time.

The Engineer will not permit the use of heavy concentrations of curing compound that will not properly set and that may be tracked into homes or businesses when liquid membrane-forming compound is used in curing operations.

2. **Asphalt concrete sidewalk:** When specified on the plans, the Contractor shall place bedding material consisting of approved aggregate conforming to the grading requirements of No. 8 aggregate in layers not more than 4 inches in depth, loose measurement, and thoroughly compacted.

Asphalt concrete shall then be placed in forms in one or more courses to provide the specified depth once compacted. The Contractor shall compact the asphalt concrete by means of a hand-operated or power roller of a type and weight acceptable to the Engineer. The Engineer will allow tamping by hand in areas inaccessible to a roller. Regardless of the method, the means of compaction shall produce a smooth, dense, uniformly compacted sidewalk.

- (b) **Hydraulic Cement Concrete Steps:** The Contractor shall construct hydraulic cement concrete steps in accordance with Sections 404 and 406. The tread portion of steps shall be given a lightly broomed texture. Finished concrete shall be cured and protected in accordance with Section 316.04.
- (c) **Handrails:** The Contractor shall construct steel handrails using standard or special fittings as necessary, or joints may be welded. If joints are welded, exposed joints shall be finished by grinding or filing to give a neat smooth textural appearance. Handrails shall be bonded internally to maintain continuity. Handrails shall be electrically grounded according to Section 410.03(b).

Metal items, including rails, posts, and fittings, shall be galvanized in accordance with Section 233 except in the case of metal posts and rails fabricated from pregalvanized material whose ends and other exposed areas were satisfactorily repaired and protected with a material conforming to Section 233.

When rails are placed on a mortar rubble wall, the wall shall be securely capped with 12 inches of Class A3 concrete.

- (d) **CG-12 Detectable Warning Surface:** The sidewalk ramp shall be constructed in accordance with Section 502, the provisions of this section for hydraulic cement concrete sidewalk and the details shown in the VDOT Road and Bridge Standard. Detectable warning/truncated domes and detectable warning surfaces shall be furnished and installed in accordance with the details in this section, the manufacturer's recommendations where applicable, the VDOT Road and Bridge Standard and the plans.

All permanent installations of detectable warning surfaces shall be "wet set" in freshly placed concrete. Concrete pavers shall be wet set in concrete with a minimum depth of 4 inches of concrete underneath, unless otherwise shown on the plans or recommended by the manufacturer.

Surface mounted detectable warning surfaces are permitted only for temporary installations where the detectable warning will be in service 6 months or less.

The Contractor shall provide the Department with the manufacturer's installation instructions at least 48 hours in advance of the start of installation.

504.04 – Measurement and Payment

Hydraulic cement concrete sidewalks will be measured in square yards of finished surface and will be paid for at the contract unit price per square yard for the depth specified. Each structure located within the limits of the sidewalk having an area greater than 1 square yard will be excluded in computing the square yards of sidewalk eligible for payment.

Asphalt concrete sidewalks will be measured in tons of asphalt mixture placed and finished and will be paid for at the contract unit price per ton.

The contract unit price for sidewalks shall include excavating, removing existing sidewalk, and disposing of surplus and unsuitable material if regular excavation is not shown in the sidewalk area. When the sidewalk area is located in the cross-sectional area for roadway excavation, excavation within the sidewalk area will be paid for at the contract unit price for regular excavation.

Bedding material will be measured in tons or cubic yards in accordance with Section 109 and will be paid for at the contract unit price per ton or cubic yard.

Concrete steps will be measured in cubic yards of concrete and pounds of reinforcing steel and will be paid for at the contract unit price per cubic yard of concrete and per pound of reinforcing steel.

Handrails will be measured in linear feet along the top rail and will be paid for at the contract unit price per linear foot. This price shall include grounding and concrete placed on mortar rubble walls for setting the handrail.

CG-12 Detectable Warning Surface will be measured in square yards and paid for at the contract unit price per square yard. This price shall be full compensation for furnishing and installing approved truncated dome finished materials including but not limited to concrete pavers, other Department approved materials, integral visual contrast, dowels or other anchorage devices.

Geotextile drainage fabric will be measured in square yards to the limits shown on the plans or as directed by the Engineer and will be paid for at the contract unit price per square yard. Overlaps, overwidths, and waste fabric will not be measured. This price shall include preparing the surface; furnishing and installing fabric, overlaps, and repair work; and excavating and backfilling toe-ins.

Payment will be made under:

Pay Item	Pay Unit
Hydraulic cement concrete sidewalk (Depth)	Square yard
Concrete, Class A3, Miscellaneous	Cubic yard

CG-12 Detectable Warning Surface

Square yard

ITEM-VA-701

TRAFFIC SIGNS

701.01-Description.

This work shall consist of furnishing, fabricating, and erecting signs as specified on the plans to include sign and sign post.

701.02-Materials.

Reflective sheeting shall conform to the requirements of Section 247 of the VDOT Road and Bridge Specifications.

701.03-Procedures.

(a). **Fabrication:**

1. **Aluminum welds:** Aluminum shall be welded in accordance with the requirements of Section 407.
2. **Sign panels:** Panels shall be fabricated of aluminum 0.100-inch thickness and shall be smooth, flat and free of metal burrs and splinters. Sign panels for overlays shall be 0.080-gage aluminum alloy conforming to the requirements of Section 229.02 (a).
3. **Applying reflective background sheeting:** Sheeting shall be applied in accordance with the requirements of the manufacturer's recommendations.

A single piece of applied sheeting shall be at least 4 by 4 feet on sign panels 16 square feet or more in area, except for sign panels fabricated with fluorescent prismatic lens orange sheeting. Sign panels 16 square feet or more in area and fabricated with fluorescent prismatic lens orange sheeting shall consist of sheeting at least 4 by 2 feet except that one piece of sheeting may be less than 2 feet wide to obtain the exact dimension required. Joints, splices or laps will not be permitted on sign panels less than 16 square feet in area except for the following:

--One factory splice from the roll will be permitted.

--One joint will be permitted on fluorescent prismatic lens orange signs when one dimension of the panel is greater than 36 inch and less than 48 inch.

When more than one width of sheeting, except fluorescent prismatic lens orange, is applied to a sign panel, sheeting edges

shall form a vertical butt joint or may overlap not more than 3/8 inch. Where horizontal joints are used, except for fluorescent prismatic lens orange sheeting, the bottom edge of the top sheeting shall lie over the top edge of the next lower sheeting in a shingle lap of not more than 3/8 inch. Multiple pieces of fluorescent prismatic lens sheeting shall be installed with a gap 1/32 inch to 1/16 inch between the edges. Sheeting shall be carefully matched to maintain uniform shading and prevent contrast between widths of sheeting.

The finished sign shall be free from cracks, gaps, streaks, wrinkles, blisters, discoloration, buckles, and warps and shall have a smooth surface of uniform color.

3. **Letters, numerals, arrows, symbols, borders, and other features of the sign message:** Features of the sign message shall conform to the requirements of the MUTCD. Units of the sign message shall be formed to provide a continuous stroke width with smooth edges; present a flat surface free from wraps, blisters, wrinkles, burrs, and splinters; and conform to the following:

- a. **Type L1, screen process, applied:** Features shall be produced by a direct or reverse screening process approved by the Engineer. Sign messages and borders that are darker than the sign field shall be produced by the reverse process in which the message and border are outlined by a color that is darker than the paint or the sheeting on the sign field. Transparent colors, inks, and paints used in the screening process shall be of the type and quality recommended by the sheeting manufacturer.

Screening shall produce a uniform color and tone. Edges of the legend and borders shall not have blemishes.

Signs shall be air dried or baked in accordance with the requirements of the manufacturer's recommendations to provide a smooth, hard finish.

- b. **Type L2, plastic film sheeting, applied:** Features of the sign message shall be cut from plastic film sheeting of the color specified on the plans. Sheeting shall be an elastomeric pigmented film suitably compounded and processed, coated on one side with an adhesive, and covered with a paper liner that shall be removable from the adhesive without being moistened. Adhesive shall be activated by heat or a solvent recommended by the sheeting manufacturer and shall be suitable for use with a hand roller, squeeze roller, or vacuum applicator that will form a durable bond

to wood, metal, plastic, porcelain enamel, paint lacquer, and reflective sheeting. Sheeting shall be at least 0.002 and not more than 0.0035 inch in thickness and sufficiently opaque so that its color will be unaffected by the color of the sign field.

- c. **Type L3, cutout, reflective sheeting, pressure applied:** Features of the sign message shall be cut from approved reflective sheeting of the color specified on the plans. Sheeting shall have heat-activated or pressure-sensitive adhesive and be applied to the background sheeting in accordance with the requirements of the manufacturer's recommendations.
 - d. **Type L4, overlay film, pressure applied:** Features of the sign message are created by using a background sheeting of the color needed for the sign message and then applying the overlay film with the sign message areas removed from the film. The overlay film shall be transparent and shall be of the color needed to provide the correct background color of the sign.
5. **Joining sign base panels:** Horizontal joints will not be permitted. Where multiple vertical panels adjoin, the face and edges shall be milled or finished to a tolerance of $\pm 1/32$ inch from a straight plane such that no gap more than 1/16 inch is allowed between panels.
 6. **Applying the sign message:** Features shall be straight, properly spaced, smooth, and free from irregular edges.
 7. **Sign finishing:** The complete outer edge, splices, messages, and borders of signs shall be sealed after application to the sign panel. Sealant material and its application shall be in accordance with the sheeting manufacturer's recommendations.
 8. **Rejected sign messages:** Sign messages rejected by the Engineer shall be immediately obliterated by the Contractor.
- (b) **Transporting and Storing Signs From the Fabricator:** Signs shall be transported in accordance with the requirements of either of the following methods.
1. Signs shall be transported in cardboard cartons with a slipsheet covering the sheeting. The slipsheet shall be paper with a plastic coating on one side with the plastic placed toward the sign sheeting in accordance with the requirements of the sheeting manufacturer's recommendations. Not more than 10 signs may be placed in one carton. Signs shall alternate face to face, back to back, throughout the carton. A microfoam pad at least 1/16 inch in thickness shall be placed between signs place face to face. Cartons shall be placed

vertically within a container designed to elevate boxes above ground level and provide lateral structural support. Cartons shall not be exposed to moisture during transportation; or

2. Signs shall be transported on an open truck or trailer bed with vertical racks for attachment of signs. Racks shall be designed to provide lateral structural support and allow the free flow of air around the sign face. Large signs may be transported on an open truck or trailer bed in shipping containers consisting of framing around edges of signs. Framing shall be nontreated lumber that will provide support for the sign without allowing pressure on the sign sheeting. Each container may house two signs positioned with the sign sheeting facing toward the inside. Signs shall be held in place in containers through the use of metal stiffeners attached to the framing, T-bars and Z-bars, and horizontal stiffeners. Shipping containers shall be secured in the vertical position for transportation.

Signs transported in cardboard cartons shall be stored in original shipping containers in a dry, enclosed location providing protection from extreme heat and humidity. Signs transported on racks or in wooden containers shall be stored on vertical racks designed to elevate signs above ground level, provide lateral structural support, and allow the free flow of air around the sign face. Signs shall not be stored where they are subjected to water runoff.

Signs may be removed from storage and installed on their structural supports before the structure is erected. The structure along with the sign shall be erected within 24 hours after removal of the sign from storage. During this time period, the sign and its structural support shall be stored at a sufficient angle to facilitate water runoff from the sign while preventing the sign from coming in contact with the ground.

Signs shall not be banded together, covered with tarps, stored flat, or subjected to pressure on the sign sheeting.

Signs transported or stored in cardboard cartons that have been exposed to moisture to the extent that moisture has entered the cartons will be rejected. The Contractor shall immediately obliterate the sign message and remove rejected signs from the project.

- (c) **Transporting and Storing Relocated Signs:** Relocated signs shall be transported and stored in a manner that will not allow pressure to be placed on the sign sheeting. Relocated signs shall be stored in their vertical position above ground level. Relocated signs that have been removed from their structure shall be stored in accordance with the requirements of (b) herein.
- (d) **Erection:** Vertical clearance for overhead and bridge mounted sign structures

shall be no less than 19 feet 0 inches and no more than 21 feet 0 inches from the bottom of the lowest mounted sign panel to the crown of the roadway, unless otherwise specified on the plans. Walkway or luminaire assemblies shall have a vertical clearance of no less than 17 feet 6 inches from the bottom of the assembly to the crown of the roadway. Sign panels shall be installed during a sequence of construction as required to provide necessary traffic control. When possible, sign panels shall be installed at a time when covering of the sign message will not be needed. When this is not possible, a porous cloth cover rendering the sign message nonvisible shall be placed over the sign sheeting, folded over the sign edges, and secured to the back of the sign panel. Sign panels shall be securely fastened to posts or supports and erected plumb. Stud breakage of 10 percent or less of the total number of studs may be repaired with rivets. If breakage exceeds 10 percent, the sign panel will be rejected.

Ground-mounted signs shall be horizontally angled at 93 degrees between the face of the sign and the center line of the roadway.

Vertical and horizontal spacing between signs shall be 1 inch.

A neoprene gasket 1/16 inch in thickness shall be used between the seat of the galvanized steel post clamps and the framing unit.

Illumination of signs shall be in accordance with the requirements of Section 705.

Damage to reflective sheeting may be repaired and edge sealed in accordance with the requirements of the manufacturer's recommendations and the following: Sign patch material shall be of the same type and color as the surrounding sheeting and shall have at least the same life expectancy. Patching will not be permitted on any letter, numeral, arrow, symbol, or border. Where the number, size, or spacing of patches is more than the following, the sign will be rejected and shall be replaced at the Contractor's expense:

Sign Face Area (sq ft)	Max. No. of Patches	Max. Size of Patches (sq in)	Min. Spacing Between Patches (in)
24.99 or smaller	No patching allowed		
25 to 49.99	1	1	0
50 to 99.9	2	1	6
100 to 199.9	3	2	6
200 or larger	4	3	12

Overlays and demountable message including borders existing on the signs shall be removed to facilitate the installation of the new overlayment. Bullet holes and bent sections shall be flattened so that the sign face is free of projections and large indentation to facilitate installation of the new overlayment.

Overlays 3 feet or less in total horizontal dimension shall be accomplished with one panel. Overlays greater than 3 feet in total horizontal dimension shall be accomplished with panels no less than 3 feet wide except that one panel per overlay may be less than 3 feet wide to obtain the exact horizontal dimension required. Joints shall be tightly butted and not overlapped.

Overlay panels shall be erected with aluminum rivets. Rivets shall be no less than 3/16 inch in diameter and of such length as to fasten the panels securely and form a head conforming to the manufacturer's recommendations. Rivets shall be located on 1-foot centers, positioned 1 inch from each panel's edge, around the sign's perimeter. Where overlay panels are 30 inches or greater in width, a column of rivets shall be installed on 1-foot centers down the centerline of the panel. Rivets shall be installed in such a sequence as to prevent buckling of the panels.

In the Hampton Roads District, at installations where the existing sign panel is attached by stud welds to the horizontal supports, 3/8-inch galvanized bolts, washers, nuts, and fiber washers shall be used in addition to rivets to attach the overlay panels. Bolts shall be located in alignment with each horizontal support (z-bar, t-bar), positioned 1-foot from each panel's edge, and spaced on 1-foot-maximum spacings along each horizontal support. At locations where existing stud welds and panel clips are in the area of the proposed bolt locations, the bolts shall be relocated as needed to miss these. Nuts shall be tightened only to the point just before the sign panel begins to buckle in that area.

Superficial damage to sign panels may be repaired using proper methods to obtain a smooth and flat panel. Sign panels that have more than superficial damage will be rejected and shall be replaced at the Contractor's expense.

701.04-Measurement and Payment.

Sign Panels will be measured in square feet and will be paid for at the contract unit price per square foot. This price shall include background sheeting, sign messages, framing units, and hangar assemblies.

Payment will be made under:

Pay Item
Sign Panel

Pay Unit
Square Foot

END ITEM VA-701

APPENDIX A

CONSTRUCTION SAFETY AND PHASING PLAN

CONSTRUCTION SAFETY & PHASING PLAN

This Construction Safety & Phasing Plan (CSPP) has been developed for the Leesburg Executive Airport, in accordance with FAA Advisory Circular (AC) 150/5370-2G, Section 2 Plan Requirements. The outline included in the AC has been followed and is referenced in the document below.

Project Description

The purpose of the project is to develop the north end of the airport with an apron and aircraft tie downs, nested t-hangars, and executive hangars. Work includes grading, paving, stormwater management, hangar construction and the installation of water and sewer lines.

205 - Coordination

As per AC 150/5300-9B, the sponsor will conduct pre-bid and pre-construction conferences as the project moves forward towards construction. This project is being funded through separate sources. A pre-design meeting was held on January 8, 2020 with representatives from the FAA, DOAV, Airport, and the Owner's Project Managers.

- a) **Contractor Progress Meetings** - The project specifications require the construction contractor to attend bi-weekly progress meetings with representatives of the Airport and the Engineer present to discuss scheduling, safety compliance, operations, and progress across the project site. Meeting frequency may be adjusted as required based on the level of work being performed.
- b) **Scope or Schedule Changes** - Any scope or scheduling changes discussed at these meetings may necessitate a revision to this CSPP and will be coordinated immediately following the progress meeting.
- c) **FAA ATO Coordination** - Coordination of the project design and Construction Safety Drawing has been made through the FAA Washington Area District Office. The Construction Safety Drawing is attached to this CSPP. Construction will take place outside of the Runway Object Free Area (ROFA) and the Taxiway Object Free Area (TOFA). There are no anticipated impacts to existing NAVAIDs.

The Contractor and Owner's Project Manager will coordinate with the airport management staff to verify that the proper NOTAMs are in place as required.

206 – Phasing

- a) The Contractor shall verify location and placement of all barricades (traffic drums, low profile aviation barricades) in the field with the Owner. The condition and location of all lighted barricades shall be checked daily by the Contractor.

- b) The Contractor's superintendent shall have regular bi-weekly progress meetings with the Owner's Project Manager and the airport management. The project schedule and work anticipated for the week shall be reviewed at each meeting.
- c) A project schedule shall be submitted prior to the start of construction outlining dates for pavement closures. The Contractor shall notify the Owner 14 calendar days in advance of beginning work within any closure area.
- d) The Contractor shall begin site demolition and installation as per the plans.
- e) The Contractor shall follow all safety plan requirements as stated in the safety plan notes. No deviation will be allowed unless otherwise coordinated with the Owner's Project Manager.
- f) Traffic barrels and low-profile aviation barricades shall be placed in the locations noted on the plan during each area of work. The Contractor may be asked to relocate or place barricades in different locations to improve airport operations.
- g) The Contractor shall assess the locations of haul roads to access construction areas. It is the Contractor's responsibility to respect all runway/taxiway safety areas and runway/taxiway object free areas for the safe operation of aircraft and construction equipment.
- h) Barricades shall be placed during the work impacting the respective TLOFA. Once the work in the area is complete the barricades shall be removed.
- i) The Contractor shall submit a project schedule identifying the critical dates when critical work will occur in the TLOFA.

207 - Areas and Operations Affected by Construction Activity

a) Identification of Affected Areas -

- Area 1– Area 1 work consists of work outside the existing TLOFA providing access to the northeastern most existing hangar.
- Area 2A– Area 2A work requires closure of the taxi lane providing access to the northeastern most existing hangar.
- Area 2B– Area 2B work requires closure of the taxi lane providing access to the northeastern most existing hangar.

b) Mitigation Effects –

- Area 1 – Work in this area is outside the TLOFA. Impacts to airport operations are minimized through time limitations and liquidated damages.
- Area 2A – The airport will coordinate with hangar tenants to temporarily relocate them to hangars or tie-downs at the southern end of the airport, if desired. Work in this area is limited to installation of utilities and stormwater structures within the TLOFA. The closure of this area may represent an inconvenience for the general aviation tenants for the adjacent hangars. This will be mitigated through closure time limitations and associated liquidated damages. Proper barricades will be placed closing the pavement. This closure will be coordinated through airport management via communication with their tenants and NOTAMs.
- Area 2B – The airport will coordinate with hangar tenants to temporarily relocate them to hangars or tie-downs at the southern end of the airport, if desired. Work in this area is limited to placing base stone and paving within the TLOFA. The closure of this area may represent an inconvenience for the tenants for the adjacent hangars. This will be mitigated through closure time limitations and associated liquidated damages. Proper barricades will be placed closing the pavement. This closure will be coordinated through airport management via communication with their tenants and NOTAMs.

208 - Navigation Aid (NAVAID) Protection

The Contractor staging and work area is located outside of the Runway Safety Area (RSA) and the Runway Object Free Area) as shown on the Construction Safety and Phasing Plan (see Attachment A of this document). In general, construction work will occur away from existing navigational aids. General requirements for the protection of existing utilities, including NAVAIDs, are presented in Project Special Provisions of the project specifications and reads as follows:

All existing facilities will be carefully protected by the Contractor. Any facilities damaged by the Contractor will be repaired immediately and restored to original condition. The contractor shall be required to provide a private utility locating firm for all private utility locations. All runway lights, taxiway lights, signs, and concrete surfaces to remain exposed shall be protected from asphalt and paint spray by suitable means. These and any other above-ground facilities shall be cleaned, if asphalt or paint is deposited on them, to the satisfaction of the Owner's Project Manager. It is understood and agreed that the OWNER does not guarantee the accuracy or the completeness of the location information relating to existing utility services, facilities or structures that may be shown on the plans or encountered in the work. Any inaccuracy or omission in such information shall not relieve the Contractor of his/her responsibility to protect such existing features from damage or unscheduled interruption of service.

Should the Contractor damage or interrupt the operations of a utility service or facility outside the project limits by accident or otherwise, he shall immediately notify the proper authority and the

Owner's Project Manager and shall take all reasonable measures to prevent further damage or interruption of service. The Contractor, in such events, shall cooperate with the utility service or facility owner and the Owner's Project Manager continuously until such damage has been repaired and service restored to the satisfaction of the utility or facility owner.

The Contractor shall bear all costs of damage and restoration of service to any utility service or facility due to his/her operations whether or not due to negligence or accident. The Contract Owner reserves the right to deduct such costs form any monies due or which may become due to the Contractor.

209 - Contractor Access

- a) **Locations of Stockpiled Construction Materials** – All stockpiled material or equipment shall be located in the contractor's staging area as shown on the plans. Prior to leaving work each day the contractor shall return all construction material to the staging area or in areas approved by Owner's Project Manager. No trenches will be allowed to remain open after working hours. All debris from the demolition and other construction debris shall be removed from the airport property in a location to be determined by the contractor.
- b) **Vehicle and Pedestrian Operations**
 - 1) **Construction site parking** – Personal vehicles shall be parked outside of secured airport areas.
 - 2) **Construction Equipment Parking** – Prior to leaving work each day the Contractor shall return all construction equipment to the staging area. For location of the staging area see Sheet 4.
 - 3) **Access and Haul Roads** – Access roads to be used under this contract shall be those approved by the Owner's Project Manager. In general, the Contractor shall confine his movement to the designated haul routes. If existing pavement is damaged by the contractor it shall be repaired, to its original condition, by the contractor at the contractor's expense. Metal track vehicles will not be permitted on existing pavements without protective matting to prevent marring of the surface. For the contractor's access route see Sheet 3.

The Contractor shall conduct his operations in such a manner as to assure that such operations do not impede owner access to any area of the airfield at any time.

- 4) **Marking and Lighting of Vehicles** - All vehicles operating within the project limits shall be lighted at their highest point with an amber flashing dome light and/or a minimum 3 feet x3 feet orange and white checkered flag, and each vehicle shall display company name and/or logo on each side for easy identification. All lights and flags shall meet FAA Advisory Circular 150/5210-5, Painting, Marking, and Lighting of Vehicles Used on an Airport. Copies of the Advisory Circular will be made available upon request.

- 5) **Description of proper vehicle operations** - All construction vehicles, including personal vehicles, must be approved for access by the Owner's Project Manager.
- 6) **Required Escorts** – This is a general aviation airport that does not currently require badging. Escorting of workers is not required. The Contractor will be responsible for the actions of all laborers, sub-contractors, drivers, etc. working on the airport.
- 7) **Training requirements for vehicle drivers** – There are no formal training requirements established for the airport. Operation of a vehicle on the airport will require the possession of a valid driver's license by the operator. Insurance will be required for all vehicles being used on the airport.
- 8) **Situational awareness** - The Contractor's employees shall all maintain his or her own situational awareness for the duration of the project. This is not a towered facility so it will be imperative that an awareness of surroundings is maintained.

Workers, equipment, or other construction related material are not allowed within the Runway Safety Area of an active runway. Ensure that no construction employees, employees of subcontractors, or suppliers, or other persons enter any part of the airport outside of the construction site unless authorized.

During construction, adjacent aprons, taxi lanes, taxiways and runway will be open to aircraft unless otherwise noted. Aircraft shall always have the right of way. Contractor shall be aware of aircraft movements and the jet blast and/or prop-wash associated with these aircraft. The Contractor shall secure all loose items on the job site.

- 9) **Two-way radio communication procedures** - The Contractor shall provide his own two-way radios for communication throughout the project. The airport UNICOM frequency is 122.975 MHz. The Contractor shall monitor this frequency to comply with instructions from airport management, and for the safety of his personnel during a potential aircraft emergency.

10) Maintenance of the secured area of the airport

- a) **Fencing and gates** - The Contractor shall be responsible for controlling access to the project site through the construction entrance. At the completion of each working day, the Contractor shall close and lock the construction entrance gate prior to departing the project site.
- b) **Badging requirements** – Badging is not required at this airport.

210 - Wildlife Management

- a) **Trash** - The Contractor shall clean all construction areas of litter, including food items such as wrappers, bottles, etc. on a minimum daily basis, or more frequently as necessary identified by the airport management or Owner's Project Manager. The Contractor shall require his employee's and subcontractor's to clean-up and properly dispose of these items prior to departing the project site.
- b) **Standing Water** – If wet conditions are encountered during construction, the contractor is responsible for dewatering areas to remove standing water.
- c) **Tall grass and seeds** - For ground stabilization measures, only the use of the grass type and mulch type included in the project plans and specifications shall be used. Substitute grass and mulch types shall require review for comparison to known wildlife attractant materials and written approval from the Owner's Project Manager prior to its use.
- d) **Poorly maintained fencing and gates** – The airport fencing and gates shall be protected at all times. Any damage to a gate or fence by the contractor shall be repaired immediately.
- e) **Disruption of existing wildlife habitat** – This project is not expected to disrupt any existing wildlife habitat. The Contractor shall notify the airport management immediately should this situation occur.

211 - Foreign Object Debris (FOD) Management

The Contractor shall keep all active airfield pavements and access roads clear of all debris, stone, dirt, mud, concrete, etc. during construction. All active pavements shall be cleaned of construction debris and spillage immediately. The Contractor shall visually inspect active pavements after each crossing by vehicles throughout the duration of the project.

The Contractor shall clean all construction areas of litter, loose papers, debris, etc. on a minimum daily basis. A more frequent basis may be required if so directed by the airport management or Owner's Project Manager. The Contractor shall require his employee's and subcontractor's to clean-up and properly dispose of these items prior to departing the project site.

212 - Hazardous Materials (HAZMAT) Management

No hazardous materials are anticipated to be implemented or removed with the construction project. Contractors operating construction vehicles and equipment on the job-site shall be prepared to expeditiously contain and clean-up spills resulting from fuel or hydraulic fluid leaks. The availability of Contractor provided spill clean-up kits is recommended.

213 - Notification of Construction Activities

- a) **Notification of Construction Activities** – The Contractor and all sub-contractors shall designate a representative and alternate to contact on 24 hours basis should problems arise. The point of contact provided must be able to coordinate an immediate response to correct any construction related activity that may adversely affect the operational safety of the

airport. The Contractor shall provide a listing of all contact persons and all supervisory personnel and all sub-contractors.

- b) **NOTAMs** - The owner will issue the necessary NOTAMs for reflect hazardous and operational conditions. The Contractor shall work with the Owner's Project Manager and owner to schedule NOTAM issuance and Taxiway closures. The Contractor shall not begin work unless and until 72-hours prior notice has been given the Owner's Project Manager and airport management.
- c) **Emergency Notification Procedures** - Emergency notification procedures shall initiate with the Contractor dialing 911 to report the emergency. Secondary notification shall be made to the airport management, at (703) 737-7125. Airport management shall verify with Contractor that 911 has been dialed, and will provide further direction if necessary to the Contractor. The Contractor shall cooperate with airport management and emergency personnel as needed.
- d) **Coordinate with ARFF** – This project will not deactivate any waterlines, block any emergency routes, or use any hazardous materials.
- e) **Notification to the FAA**
 - 1) **Part 77** – If the Contractor utilizes cranes, bucket trucks or other equipment exceeding 25 feet in height, the contractor will be responsible for filing a “Notice of Proposed Construction or Alteration (FAA Form 7460) with the FAA prior to erecting equipment. The Contractor should allow at least 30 days for FAA review.
 - 2) **Part 157** – Not applicable
 - 3) **NAVAIDS**
 - Airport owned – the contractor must notify the owner 14 days prior to implementing an event that causes impacts to NAVAIDS. No impacts are anticipated for this construction.
 - FAA owned – the airport operator must notify the appropriate FAA ATO Service Area Planning and Requirements (P&R) Group a minimum of 45 days prior to implementing an event that causes impacts to NAVAIDS. No impacts are anticipated for this construction.

214 - Inspection Requirements

- a) **Daily Inspections** - Daily safety inspections shall be performed by the Contractor throughout the duration of the construction project. A Construction Project Daily Safety Inspection Checklist has been developed based on the guidelines included in Appendix D of AC 150/5370-2G. This checklist is included in the project specifications for the Contractor's use. The Owner's Project Manager's on-site representative will be present

during these daily safety inspections. Bi-weekly inspections are anticipated to be made by the Owner's Project Manager throughout the project for verification of the Contractor's compliance with this CSPP. Additional inspections are anticipated to be made by airport management throughout the project.

- b) A final inspection shall be made by the Airport Sponsor, FAA, Virginia Department of Aviation, Owner's Project Manager, Owner, and Contractor prior to acceptance of the construction project.

Prior to the opening of the closed section of apron/TLOFA the contractor must perform a walkthrough of the construction area with airport personnel and the Resident Project Representative (RPR) to confirm that the apron is clear of foreign object debris (FOD) or other hazards.

The Contractor shall be required to remedy any deficiencies immediately, whether caused by negligence, oversight, or project scope change to the satisfaction of the airport management and the Owner's Project Manager.

215 - Underground Utilities

Coordination has been made during the project design with owners of the known utilities located within the project limits. The Contractor is still required to contact Miss Utility prior to any excavation on the jobsite, for marking of these known utilities. The Contractor is also required to cooperate as necessary with the utility owners should relocation of an underground utility be necessary.

- 1) Underground utilities are known to be located in the project areas. Existing underground utilities include but not limited to underground taxiway lighting and ground systems, water line and sewer line. Locations of utilities if shown on the plans are approximate only. All utilities and facilities are not necessarily indicated on plans. It shall be the Contractor's responsibility to locate and protect existing utilities and facilities from damage.
- 2) All existing facilities will be carefully protected by the Contractor. Any facilities damaged by the Contractor will be repaired immediately and restored to original condition at the Contractor's expense. All taxiway lights, signs, and concrete surfaces to remain shall be protected by suitable means. If damaged by the Contractor, these and any other above or below ground facilities shall be repaired at the Contractor's expense, to the satisfaction of the OWNER'S PROJECT MANAGER and the OWNER.
- 3) The Contractor shall be solely responsible for location and protecting all existing above and underground facilities and shall bear all associated costs within the Item "Mobilization". The Contractor shall employ a private utility locator service or shall obtain and utilize cable location equipment in order to field locate existing cable runs not to be disturbed/replaced by this project.

- 4) It is understood and agreed that the OWNER does not guarantee the accuracy or the completeness of the location information relating to existing utility services, facilities, or structures that may be shown on the plans or encountered in the work. Any inaccuracy or omission of such information shall not relieve the Contractor of his/her responsibility to protect such existing features from damage or unscheduled interruption of service.
- 5) Should the Contractor damage or interrupt the operations of a utility service or facility outside the project limits by accident or otherwise, he shall immediately notify the proper authority and the OWNER'S PROJECT MANAGER and shall take all reasonable measures to prevent further damage or interruption of service. The Contractor, in such events, shall cooperate with the utility service or facility owner and the OWNER'S PROJECT MANAGER continuously until such damage has been repaired and service restored to the satisfaction of the utility or facility owner.
- 6) The Contractor shall bear all costs or damage and restoration of service to any utility service or facility due to his/her operations whether or not due to negligence or accident. The Contract OWNER reserves the right to deduct such costs from any monies due or which may become due to the Contractor.

216 - Penalties

Should the Contractor or other individuals at the project site not comply with the requirements of this CSPP and/or the airport's rules and regulations, the Town of Leesburg (Leesburg Executive Airport) reserves the right to remove said individual(s) from the project site. Any individual removed from the project site shall not be allowed back on the project site unless expressly permitted by airport management.

217 - Special Conditions

The Contractors supervisory personnel are expected to become knowledgeable regarding the airport's operational, safety and security requirements, actively participate in project meetings, establish effective communications with the RPR and airport management. Scheduling between the contractor/owner and tenant will be required on a weekly basis.

The Contractor shall cooperate with airport management should an emergency or other event occur that requires temporary suspension of construction operations. The operating hours of the airport are 8:30 a.m. – 5:30 p.m. Monday – Friday. There are tower facilities at this airport.

218 - Runway and Taxiway Visual Aids

- a) **General** - Throughout the duration of the construction project the contractor shall verify that these areas remain clearly marked and visible at all times and that marking, lighting, signs and visual NAVAIDS remain in place and operational.
- b) **Markings** – No markings are required for this project.

c) **Lighting and Visual NAVAIDs**

Temporarily closed section of apron/taxiway – All taxiway lighting shall be in conformance with AC 150/5340-30, Design and Installation Details for Airport Visual Aids, and AC 150/5345-50, Specification for Portable Runway and Taxiway Lights. When disconnecting taxiway lighting fixtures; disconnect the associated isolation transformers. Alternately, cover the light fixture in such a way as to prevent light leakage. Avoid removing the lamp from energized fixtures because an excessive number of isolation transformers with open secondaries may damage the regulators and/or increase the current above its normal value. Secure, identify, and place any above ground temporary wiring in conduit to prevent electrocution and fire ignition sources. Low profile lighted barricades will be provided on the apron side of the construction and lighted barrels will be provided on the construction side of the project to prevent access to the apron by construction equipment.

219 - Marking and Signs for Access Routes

The Contractor's access route is shown on Sheets 2 & 3 of the plans. Access points and on-airport access routes shall be discussed at the pre-construction meeting and at progress meetings to address construction needs and airport operational safety. The contractor is expected to maintain the haul routes in safe, clean and orderly condition at all times.

220 - Hazard Marking, Lighting, and Signing

a) **Purpose.** The hazard marking and lighting prevents pilots from entering areas closed to aircraft and prevents construction personnel from entering areas open to aircraft. Hazard marking and lighting shall also identify inlets, manholes, small areas under repair, stockpiled material, waste areas, and areas subject to jet blast.

b) Equipment

1. **Lighted Barricades.** Low profile aviation barricades shall be constructed of 12 inch white PVC pipe (cut in half) or other material approved by the Owner's Project Manager that is 6 feet in length. Spacing shall be 4 feet apart. See detail included as Attachment B of this document.
2. **Lights must be red.** A steady burning or flashing red light shall be centered on each lighted barricade and must meet the luminance requirements of the Virginia Department of Transportation. Lights must be securely mounted on barricades and spaced at no more than 10 feet. Lights must be operated between sunset and sunrise and during periods of low visibility whenever the airport is open for operations.
3. **Supplemental barricades with signs.** No supplemental signs area anticipated for this project.

4. **Air Operations Area - General.** Barricades are not permitted in any active safety area. Within runway or taxiway object free areas, and on aprons, use orange traffic drums with steady burning or flashing red lights as noted above, collapsible barricades marked with diagonal, alternating orange and white stripes shall be provided to separate all construction/maintenance areas from the movement area. All barricades adjacent to any open runway or taxiway/taxilane safety area, or apron must be as low as possible to the ground, and no more than 19 inches high, exclusive of supplementary lights. Barricades must be of low mass; easily collapsible upon contact with an aircraft or any of its components; and weighted or sturdily attached to the surface to prevent displacement from prop wash, jet blast, wing vortex, or other surface wind currents. If affixed to the surface, they must be frangible at grade level or as low as possible, but not to exceed 3 inches above the ground.
5. **Air Operations Area - Runway/Taxiway Intersections.** No work is planned near the runway / taxiway intersections. Lighted barricades will be installed for all closed taxi lane sections.
6. **Maintenance.** The Contractor must have a person on call 24 hours a day for emergency maintenance of airport hazard lighting and barricades. The Contractor must file the contract information with the airport operations. Lighting should be checked for proper operation at least once per day, preferably at dusk.

221 - Protection of Runway and Taxiway Safety Areas

- a) **Runway Safety Areas (RSA)** – A runway safety area is the defined surface surrounding the runway prepared or suitable for reducing the risk of damage to airplanes in the event of an undershoot, overshoot, or excursion from the runway, and extending 1,000 feet beyond each runway end. No work is proposed in this area. All personnel, materials and/ or equipment shall remain clear of this area at all times.
- b) **Runway Object Free Area (ROFA)** - A runway object free area is defined as the surface surrounding the runway that is to remain clear of above-ground objects protruding above the nearest point of the safety area. No work is proposed in this area. All personnel, materials and/ or equipment shall remain clear of this area at all times unless otherwise coordinated with airport management.
- c) **Taxiway Safety Area (TSA).** A taxiway safety area (TSA) is a defined surface alongside the taxiway prepared or suitable for reducing the risk of damage to an airplane unintentionally departing the taxiway. The taxiway safety area width varies by the size and group of aircraft using the taxiway or taxilane. Construction activities within the TSA area subject to the following conditions:
 - 1) No construction may occur within the existing TSA while the taxiway is open for aircraft operations.

- 2) The airport operator must coordinate the adjustment of the TSA width as permitted above with the appropriate FAA Airports Regional or District Office and the FAA air traffic manager and issue a NOTAM.
- 3) Excavations:
 - Open trenches or excavations are not permitted within the TSA while the taxiway is open. If possible, backfill trenches before the taxiway is opened. If the taxiway must be opened before excavations are backfilled, cover the excavations appropriately. Covering for open trenches must be designed to allow the safe operation of the heaviest aircraft operating on the taxiway across the trench without damage to the aircraft.
 - Contractors must prominently mark open trenches and excavations at the construction site with red or orange flags, as approved by the airport operator, and light them with red lights during hours of restricted visibility or darkness.
- 4) Erosion control devices are not planned inside of any safety areas.
- d) **Taxiway & Taxiway Object Free Area (TOFA).** Unlike the Runway Object Free Area, aircraft wings regularly penetrate (extend into) the taxiway or taxiway object free area during normal operations. Thus, the restrictions are more stringent. Barricades will be used to segregate construction zones from areas open to aircraft.
 - 1) No construction may occur within the existing TOFA while the taxiway is open for aircraft operations.
 - 2) The airport operator must coordinate the adjustment of the TOFA width as permitted above with the appropriate FAA Airports Regional or District Office and the FAA air traffic manager and issue a NOTAM.
 - 3) Five-foot clearance is maintained between equipment and materials and any part of an aircraft (includes wingtip overhang).
- e) **Obstacle Free Zone (OFZ).** All personnel, materials, and/or equipment may not penetrate the OFZ while the runway is open for aircraft operations.
- f) **Runway approach/departure surfaces.** No work is proposed in the runway approaches for this project. Therefore, all personnel, materials, and/or equipment shall remain clear of the applicable threshold siting surfaces as defined in under “Threshold Siting Requirements,” of AC 150/5300-13A.

222 - Other Limitations on Construction

a) Prohibitions

- 1) No use of tall equipment. If the contractor utilizes cranes, bucket trucks or other equipment exceeding 25 feet in height, the contractor will be responsible for filing a

“Notice of Proposed Construction or Alteration (FAA Form 7460) with the FAA prior to erecting equipment. The Contractor should allow at least 30 days for FAA review.

- 2) No use of open flame welding torches.
- 3) No use of electrical blasting caps on/or within 1,000 ft of the airport property.
- 4) No use of flare pots within the airport property.

b) Restrictions

- 1) Nighttime construction restrictions. Work hours are limited to daylight only typically from sunrise to sunset depending on time of year. The contractor shall coordinate with the airport management on final working hours.
- 2) There are no work area restrictions to simultaneous operations
- 3) There are no weekly day restrictions. Night work will need to be coordinated with the airport management.
- 4) The Contractor will not be permitted to work on the following holidays:

Annual Flower and Garden Show
Memorial Day
Independence Day
Labor Day
Thanksgiving
Day after Thanksgiving
Christmas Day
Day after Christmas
New Year's Day

APPENDIX B
SAFETY INSPECTION CHECKLIST

**Leesburg Executive Airport
Construction Project Daily Safety Inspection Checklist**

The situations identified below are potentially hazardous conditions that may occur during airport construction projects. Safety area encroachments, unauthorized and improper ground vehicle operations, and unmarked or uncovered holes and trenches near aircraft operating surfaces pose the most prevalent threats to airport operation safety during airport construction projects. The list below is one tool that the Contractor may use to aid in identifying and correcting potentially hazardous conditions.

Potentially Hazardous Conditions

Item	Action Required	or	None
Excavation adjacent to runways, taxiways, and aprons improperly backfilled.			<input type="checkbox"/>
Mounds of earth, construction materials, temporary structures, and other obstacles near any open runway, taxiway, or taxi lane; in the related Object Free area and aircraft approach or departure areas/zones; or obstructing any sign or marking.			<input type="checkbox"/>
Heavy equipment (stationary or mobile) operating or idle near AOA, in runway approaches and departures areas, or in OFZ.			<input type="checkbox"/>
Equipment or material near NAVAIDs that may degrade or impair radiated signals and/or the monitoring of navigation and visual aids. Unauthorized or improper vehicle operations in localizer or glide slope critical areas, resulting in electronic interference and/or facility shutdown.			<input type="checkbox"/>
Tall and especially relatively low visibility units (that is, equipment with slim profiles)-cranes, drills, and similar objects-located in critical areas, such as OFZ and approach zones.			<input type="checkbox"/>
Improperly positioned or malfunctioning lights or unlighted airport hazards, such as holes or excavations, on any apron, open taxiway or open taxi lane or in a related safety, approach or departure area.			<input type="checkbox"/>
Obstacles, loose pavement, trash, and other debris on or near AOA. Construction debris (gravel, sand, mud, paving materials) on airport pavements may result in aircraft propeller, turbine engine, or tire damage. Also, loose materials may blow about, potentially causing personal injury or equipment damage.			<input type="checkbox"/>
Inappropriate or poorly maintained fencing during construction intended to deter human and animal intrusions into the AOA. Fencing and other markings that are inadequate to separate construction areas from open AOA create aviation hazards.			<input type="checkbox"/>
Wildlife attractants-such as trash (food scraps not collected from construction personnel activity), grass seeds, tall grass, or standing water-on or near airports			<input type="checkbox"/>
Failure to issue, update or cancel NOTAMs about airport or runway closures or other construction related airport conditions.			<input type="checkbox"/>

Item	Action Required	or None
Failure to mark and identify utilities or power cables. Damage to utilities and power cables during construction activity can result in the loss of runway/taxiway lighting; loss of navigation, visual, or approach aids; disruption of weather reporting services; and/or loss of commutations.		<input type="checkbox"/>
Lack of radio communications with construction vehicles in airport movement areas.		<input type="checkbox"/>
Objects, regardless of whether they are marked or flagged, or activities anywhere on or near an airport that could be distracting, confusing, or alarming to pilots during aircraft operations.		<input type="checkbox"/>
Water, snow, dirt, debris, or other contaminants that temporarily obscure or derogate the visibility of runway/taxiway marking, lighting, and pavement edges. Any condition or factor that obscures or diminishes the visibility of areas under construction.		<input type="checkbox"/>
Spillage from vehicles (gasoline, diesel fuel, oil) on active pavement areas, such as runways, taxiways, or aprons, and airport roadways.		<input type="checkbox"/>
Failure to maintain drainage system integrity during construction (for example, no temporary drainage provided when working on a drainage system).		<input type="checkbox"/>
Failure to provide for proper electrical lockout and tagging procedures. At larger airports with multiple maintenance shifts/workers, construction contractors should make provisions for coordinating work on circuits.		<input type="checkbox"/>
Failure to control dust. Consider limiting the amount of area from which the contractor is allowed to strip turf.		<input type="checkbox"/>
Exposed wiring that creates an electrocution or fire ignition hazard. Identify and secure wiring, and place it in conduit or bury it.		<input type="checkbox"/>
Site burning, which can cause possible obscuration.		<input type="checkbox"/>
Construction work taking place outside of designated work areas and out of phase.		<input type="checkbox"/>

APPENDIX C
GEOTECHNICAL DATA



June 26, 2020

Steven T. Peterson, P.E.
Talbert & Bright
10105 Krause Road
Suite 100
Chesterfield, Virginia 23832

ECS Project No. 01:29694-A

Reference: Letter Report of Additional Subsurface Exploration and Geotechnical Engineering Analysis, North Apron Development, Town of Leesburg, Loudoun County, Virginia

Dear Mr. Peterson:

As authorized by the acceptance of ECS Mid-Atlantic, LLC (ECS) Proposal No. 61222-GP, dated February 28, 2020 and Change Order No. 1, dated April 28, 2020, ECS has prepared this letter report providing the results of our most recent subsurface exploration at the proposed Leesburg Airport North Apron development. The information presented in this letter is intended for use by your office and for use by other design professionals involved with the design of the proposed structures.

Previously, ECS issued a geotechnical report for this project (*Geotechnical Engineering Report, Leesburg Executive Airport North Apron Development, Report No. 01:29694, dated January 24, 2020*). The purpose of this exploration was to provide additional subsurface information regarding the presence of carbonate rock and evaluate the potential risk of sinkhole development at the site. A brief summary of the project and site conditions is presented below for clarity. A detailed description of the project site and site history can be found in our previous report.

PROJECT BACKGROUND AND SCOPE OF SERVICES

Project Overview

The project site is bound by Old Tolbert Lane SE to the North, portions of existing runway, taxiway, and hangar areas to the west and south, and Miller Drive SE to the east. The project site is currently a large open undeveloped area covered with grass. The project includes the design and construction of a new 26-unit T-hangar and multiple 60 foot by 60 foot hangars. The finished floor elevation of the structures is not yet known. The proposed construction also includes stormwater management (SWM) facilities, pavement drive/taxiways, and associated utilities. The topography ranges from a high of approximately EL. 390± feet in the eastern side of the site and a low of approximately EL. 380± feet in the western side of the site.

12 soil borings (referenced as BH-1 through BH-12) were performed as part of our 2019 exploration. To summarize the findings of our previous exploration, the borings were advanced to depths on the order of 1.3± feet to 25± feet below the existing ground surface. Borings BH-6 through BH-12 were advanced to the planned termination depth of 10± feet to 25± feet. Auger refusal was encountered at a depth of 1.3± feet to 17± feet below the existing ground surface in Borings BH-1 through BH-5. The borings generally consisted of up to 4.5± feet to 25± feet of firm to hard Fat and Lean CLAYS (CH, CL) and loose to dense SILT (ML) underlain by very dense weathered siltstone. Soft Lean CLAY (CL) was encountered in Boring BH-11 between the surface and about 2 feet below grade. Very dense weathered limestone conglomerate was encountered in Boring BH-2 at a depth of 13.5 feet below the existing ground surface. Layers of high plasticity Fat CLAY (CH) was encountered in Borings BH-6 and BH-12 at a depth of 2± feet to 12± feet below the existing ground surface. A rock fragment obtained from boring BH-2 was tested with hydrochloric acid and strong effervescence was observed.

Based on the apparently significant differences in the depth to rock as well as the presence of limestone conglomerate bedrock at the site, it was concluded that additional exploration should be performed to better qualify the potential risk for sinkhole development. The purpose of this additional exploration was to provide additional subsurface information to assist in the assessment of potential karst features at the site and identify the potential risk of sinkhole formation.

Scope of Work

The additional exploration was performed in three phases. Phase I consisted of a general site reconnaissance and an electrical resistivity imaging (ERI) survey, Phase II consisted of performing air track probe borings, and Phase III consisted of performing an additional SPT boring. ECS conducted a total of 5 ERI survey lines at locations spread across the site in the areas of the building footprints and pavement areas. After completion and review of the ERI survey, ECS mobilized the air track drill rig to the site and performed 22 auger probe borings to various depths at locations along the ERI lines and in the general vicinity of our ERI line transects and around a surficial fractured rock outcrop. After completion of the air track borings, an additional boring was performed to a depth of approximately 50± feet below the existing ground surface. After refusal on rock, 15± feet of rock core was performed at the location.

The exploration locations were selected by ECS based on both the proposed development features and existing site features. Exploration locations were located in the field by ECS personnel using GPS. The elevations shown on the boring logs were interpolated from the contour lines shown on the project drawings supplied by Talbert & Bright.

Subsurface Exploration Procedures

ERI

Phase I involved performing a total of 5 ERI lines referenced as lines 1, 2, 3A, 3B, and 4. The purpose of the geophysical survey was to provide geophysical data for the purposes of identifying any subsurface

anomalies, areas of concern, or potential sinkhole hazards along the ERI transects. This data was later used to locate the air-track probe and boring locations. The survey strategy involved collecting geophysical data along the 5 transects located across the project site as it relates to variations in electrical resistivity. ECS conducted the ERI survey using an extended dipole-dipole array. The dipole-dipole array is the industry-accepted data collection configuration for resistivity in karst areas. The dipole-dipole measurement geometry used by this array can resolve large vertical variations in subsurface resistivity that characterizes karst terrain and are expected in the carbonate conglomerate bedrock identified onsite. The extended dipole-dipole array provided high resolutions by maximizing the number of possible resistivity measurements (points) to a depth approaching or exceeding 100 feet below the ground surface along the transects. The survey was conducted using an Advanced Geosciences, Inc. (AGI) SuperSting™ 8-channel DC resistivity meter with up to 56 electrodes capability using accepted geophysical industry procedures. The survey used a constant electrode spacing of 10-feet. This resistivity array allowed for the collection of high-resolution data consisting of one data point every 5 feet horizontally and 1 to 2 feet vertically within the top 50 feet with a slight linear decrease in resolution with depth beyond about 50 feet. Total depth of penetration of the signal was programmed to penetrate approximately 100± feet into the subsurface. Additionally, a 10 feet spacing allows for the identification of features generally greater than 5 feet in diameter. Features that are smaller than 5 feet in diameter will not be consistently measured and generally will not be revealed.

Air Track Probes

Air track probes were performed at the site using a track-mounted drill rig advancing a rotating drill bit and utilizing compressed air to evacuate the soil cuttings from the borehole. Additionally, a pneumatic hammer provided additional force to pulverize dense soils and rock. Thickness and general material type (i.e.: soil, soft rock, or dense rock) can be subjectively determined based on the drilling effort and observation of any drill cuttings that were returned to the surface. Samples were not obtained from this method. This exploration method is useful in measuring the depth and thickness of subsurface strata when material samples are not required. In general, each of the probes were advanced until a minimum of 10-feet of competent bedrock as determined by observing the drilling effort, was encountered or termination for other reasons caused drilling to be stopped. Other reasons for early termination include excessive soil collapse around drilling rods or jamming of drilling equipment down hole.

Soil Boring

After completion of the ERI survey and air track probing, an additional soil test boring was performed utilizing an all-terrain vehicle (ATV)-mounted drill rig. The boring location was identified in the field by ECS personnel using GPS techniques prior to mobilization of our drilling equipment. Standard penetration tests (SPTs) were conducted in the borings at regular intervals in general accordance with ASTM D 1586. Small representative samples were obtained during these tests and were used to classify the soils encountered. Following auger refusal in the boring, rock coring techniques were utilized to advance the boring and to obtain intact rock samples using a NQ-diamond drilling bit. Rock coring was performed over an additional depth of 15± feet below the elevation of auger refusal. Each of the rock samples obtained was classified on the basis of rock type, rock quality, discontinuity spacing, weathering, and hardness of the core sample.

General Site Reconnaissance

During phase I and II of the recent geotechnical exploration the site was generally traversed as an attempt to locate potential ground surface indications of karst activity such as but not limited to closed depressions or open piping failures that could potentially focus our exploration. During our exploration several outcrops were identified throughout the site, one of which was identified to be limestone conglomerate. The limestone conglomerate outcrop was observed within the pneumatic hammer sounding cluster on the south side of ERI Line 4. Adjacent to the observed limestone outcrop were several vermin burrows which can be a sign of a subsurface pre-existing weakness such as soft soils or the propagation of a piping failure. AP-19 was centered on the visible hole adjacent to the observed limestone outcrop for further exploration. Additionally, it was observed that a large drainage swale was observed in the middle of the site. Natural drainage swales typically occur from water propagation along a geologic weakness. The observed swale was sloping to the south west which is generally consistent with the dip direction of the locally published geologic mapping.

Please note that the site reconnaissance was a general observation of the area. Vegetation along with the general landscape can mask potential surface features from observation. Additionally, site features can also develop after the general site reconnaissance and may potentially be identified after the submission of this geotechnical report.

Subsurface Conditions

ERI Interpretations

The inverted ERI cross-section for the five (5) ERI transect are included in the Appendix of this report. The figures contain color-contoured cross-section resistivity images of the modeled resistivity for the ERI alignments. In general, the data were modeled and inverted multiple times per model until the root mean square (RMS) error of the inversion was less than 5 percent, as per the manufacture's recommendations. This value allows highly erroneous (noisy) data points to be eliminated from the model. Additionally, this prohibits the model from being overextended by inverting the data an excessive number of times. Please note that due to the nature of ERI data processing, data collection and extrapolation, features often are observed to be somewhat larger than the actual insitu condition.

The carbonate bedrock below the site is known to have potential for karst conditions and the ERI transects were selected to aid in identifying potential karst features within the potential development areas. The locations of the ERI lines are shown on the attached Boring Location Diagram.

Low resistivity zones in the subsurface are indicated by modeled responses generally between approximately 0-100 Ohm-meters. These zones of low resistivity on the ERI cross-sections may indicate the presence of moist soils, saturated discontinuities in the rock, clay rich soils or potentially soft soil areas. Low resistivity zones would appear as various shades of blue in the ERI profiles in the Appendix. Low resistivity zones were encountered on all of the ERI cross sections. Significant low resistivity zones were encountered in all lines. Based on a review of the borings performed in these areas, the low resistivity features are expected to be associated with moist to wet soft residual soils on top of the weathered and unweathered rock materials.

Moderate resistivity zones are indicated by modeled resistivity responses generally between approximately 100-250 Ohm-meters. Moderate resistivities are modeled as light greenish blue to greenish yellow. Zones of moderate resistivity on the ERI cross-sections may indicate the presence soils containing gravel or cobbles, dry soils and weathered rock materials at varying moisture contents. Moderate resistivity zones may also be interpreted as weathered zones within the bedrock in which dissolution of the underlying bedrock has occurred, but have not yet weathered to the extent of creating open or mud filled voids that would be associated with incipient sinkhole activity. These zones are shown in various shades of green on the ERI profile in the Appendix, and were encountered in all of the ERI transect at various depths and stations.

Zones of high resistivity, indicated by modeled resistivity responses 250 to $\leq 2,000$ Ohm-meters, indicate weathered to unweathered bedrock, dry stiff soils or lenses of cobbles or boulders. High resistivity areas are modeled as yellow to reddish purple on our selected color scale. Zones of high resistivity were encountered in the ERI transect at depths ranging from the ground surface to approximately $100\pm$ below the existing ground surface. The depth to intact bedrock at sites underlain by carbonate rock may be extremely variable, and boulders, pinnacles, and deeper weathered zones (solution enhanced discontinuities), are common. Additionally, comparatively saturated sections of the weathered rock and un-weathered rock materials may be modeled as a low resistivity zones. High resistivity zones were encountered in lines 2, 3A, and 4 near the ground surface. These shallow high resistivity zones are likely due to dry surficial soils and weathered rock materials. The high resistivity zones encountered in Lines 1, 3B, and 4 between depths of approximately $20\pm$ feet and $40\pm$ feet may be associated with the weathered rock profile over saturated clays and silts. The high resistivity zones encountered in lines 2 and 3A are likely associated with pinnacled bedrock.

Additionally, areas indicating a very high resistivity $>50,000$ Ohm-meters would be modeled as purple. These areas have extremely high modeled resistivity values which frequently correspond to air filled voids or caves. Additionally, these features may also indicate significant mineralogical and/or weathering differences between the rocks surrounding these highly resistive features. However, in this geologic environment, a void interpretation is the most likely explanation for these highly resistive areas. Areas of very high resistivity were not encountered in our study.

Air Track Probe Borings

The 22 air track probes performed were terminated between the depths of $18.5\pm$ feet and $56\pm$ feet below existing grades. All of the borings, with the exception of AP-1, AP-3, AP-15, and AP-22, were terminated due to loss of air circulation and collapse of soft soils prior to encountering continuous rock. When in soft soils, the probes were advanced only by pushing down with hydraulic pressure. The air hammer was only activated when denser soils or rock was encountered. Probes AP-1, AP-3, AP-15, and AP-22 were terminated after encountering a minimum of 5 feet of continuous rock and/or hard drilling. Soil and rock was identified by the cuttings returned to the surface during drilling. The depth to rock (if encountered) and termination depth in each air track probe is summarized in the following table.

Table 1. Air Track Probe Summary

Probe Number	Ground Surface Elevation (ft)	Depth to Rock (ft)	Termination Depth (ft)	Comments
AP-1	383.5	9	18.5	hard rock underlain by soils @ 9'
AP-2	382.5	n/a	56	water @ 20', rock underlain by very soft soils 29'-50'
AP-3	381	44	54	soft soils (no hammer) 0'-25', 10' rock 44'-54'
AP-4	380	n/a	38	soft soils (no hammer) 2'-7', 15'-22', 26'-32'
AP-5	381	n/a	32	soft soils (no hammer) 3.5'-25'
AP-6	381	n/a	32	soft soils (no hammer) 0'-25'
AP-7	381	n/a	29	soft soils (no hammer) 5'-25'
AP-8	381	n/a	43.5	soft soils (no hammer) 2'-37', rods wet @ 25'
AP-9	381	n/a	43	soft soils (no hammer) 2'-35'
AP-10	381	n/a	40	soft soils (no hammer) 1'-25', lost air @ 25'
AP-11	381.5	n/a	44	soft soils (no hammer) 1'-38', hard rock @ 41'
AP-12	382	n/a	42	soft soils (no hammer) 0'-41', hard rock @ 41'
AP-13	381.5	n/a	36	soft soils (no hammer) 1'-26', rods wet @ 21'
AP-14	381.5	n/a	31	soft soils (no hammer) 1'-24'
AP-15	382	24	34	soft soils (no hammer) 2'-23', 10' rock 25'-35'
AP-16	382	n/a	42	soft soils 1'-34', lost air @ 22', rods wet @ 30'
AP-17	382	n/a	44	soft/medium (no hammer) soils 3.5'-44', rods wet @ 30'
AP-18	381.5	n/a	39.5	hard limestone 0'-3', soft/medium (no hammer) soils 3'-39.5'
AP-19	381.5	n/a	42	hard limestone 0'-1', soft (no hammer) soils 1'-28'
AP-20	381.5	n/a	39	soft soils (no hammer) 2'-31'
AP-21	381.5	n/a	41	soft soils (no hammer) 1'-35', WR @ 37', rods wet @ 30'
AP-22	386	25	45	20' of continuous siltstone 25'-45'

Soil Test Boring

After a review of the ERI transects and air track probe results, several areas of potentially deep weathering and significant depths of soft soils were identified. Considering the consistency of the apparent weathering profile, one boring location adjacent to air track probe AP-2 was selected for further exploratory drilling and sampling. The subsurface conditions at the selected location (referenced as Z-1) was further explored by drilling a soil test boring within the questionable area identified by the ERI survey and air track probe borings. The boring was advanced through soil and weathered rock to a depth on the order of 50± feet below the existing ground surface. Auger refusal was encountered at a depth of approximately 50± feet below the existing ground surface in weathered conglomerate rock. Rock coring

was performed to extend the boring 15 feet below the auger refusal depth. Groundwater was encountered while drilling at depths of 18.5± feet and at a depth of 16± feet after the augers were removed. The following table provides generalized characterizations of the soil and rock strata encountered in the boring.

Table 2. Subsurface Stratigraphy

Approximate Depth Range (ft)	Stratum	Description	Ranges of SPT N-values (bpf)
0 feet to .25 feet	N/A	Approximately 3 inches of topsoil	N/A
0.25 feet to 18.5 feet	I	Stiff to hard SILT (ML) with sand	10 to 38
18.5 feet to 28.5 feet	II	Very dense weathered siltstone	>60
28.5 feet to 48.5 feet	III	Very soft to very stiff Sandy Silty CLAY (CL-ML) with gravel	WOH to 29
48.5 feet to 50 feet	IV	Very dense weathered conglomerate	>60
50 feet to 65 feet	V	Unweathered, hard, highly fractured/jointed conglomerate rock	RQD 42%-80%, UCS 3,740-4,290 psi

Analysis and Sinkhole Risk Assessment

The recommendations contained in this letter report are based on the results of our subsurface explorations and review of available geologic and geotechnical information including the previous explorations performed at the site by ECS.

Based on our review of the above data, the site appears to have a layered profile consisting of alternating layers of residual soils derived from siltstone and limestone conglomerate rocks. The ERI transects indicate highly differential weathering occurring along interfaces between the two rock types. This weathering is extensive in some areas as evidenced by the wide spread very soft soils encountered in the air track probes as well as in Boring Z-1 between the depths of 28.5 feet and 48.5 feet. Additionally, these weathering differences can occur horizontally and vertically throughout this geologic setting. In general, the weathering trend appears to increase in depth with a westward dip of about 15° to 30° which is consistent with the Loudoun County geologic map bedding dip in the general vicinity of the site. Groundwater was encountered in the air-track probes and soil borings. The presence of groundwater provides the means for continued weathering to occur at the site as well as the potential for internal soil raveling related to fines migration. The rock core performed at boring Z-1 generally indicated fractured rock, but large notable fractures or soil filled voids that would be associated with an incipient sinkhole were not encountered in the boring.

The features described above are generally consistent with on-going weathering of the underlying limestone conglomerate bedrock. This weathering on its own could lead to future sinkhole development; however, it is noted that Boring Z-1 encountered an intermediate layer of weathered siltstone between the depths of 18.5 feet to 28.5 feet overlying the very soft soils. Contacts between more weather resistant

siltstone and limestone conglomerate can enhance weathering patterns in this geologic setting as it provides an avenue for groundwater to flow along and towards.

It should be noted that sinkhole development is unpredictable and subsurface explorations cannot completely eliminate the possibility of sinkhole development at a project site. Therefore, some risk of sinkhole development will always exist for the site given its geologic location. It is noted that there are not any sinkholes currently mapped at the site or in the immediate area as mapped by Loudoun County. Considering that evidence of voids were not encountered in the soil boring and the presence of the layered parent rock profile, it is our opinion that the potential for sinkhole development at this site is moderate to low.

It is noted that once site stripping has occurred and site grading operations are underway, changes in surface and subsurface water flow patterns can occur and exacerbate existing conditions. This may result in the appearance of surface depressions or even an open surface void during construction. Areas identified to be suspect during the initial earthwork phase should be further explored during construction to determine the extent, both vertically and horizontally, of possible solution activity. Specific remedial solutions can be determined for localized areas if they occur.

It is noted that surficial limestone rock was encountered in probes AP-18 and AP-19. These float rocks are common remnants of the weathering process and isolated areas of shallow rock in the form of pinnacles, lenses or boulders should be expected at the site.

Recommendations

Our previous report recommended shallow spread footings for support of the planned buildings. These recommendations were based on the results of our previous site exploration as well as our experience with similar projects within the vicinity of the proposed development. Our previous report provided an allowable bearing pressure on the order of 2,000 pounds per square foot (psf) should be available. This bearing pressure is expected to be suitable for the proposed structures. Our current exploration indicated varying depth to bedrock and potential pinnacled bedrock at the site. It should be anticipated that rock removal in areas of shallow rock identified during our previous exploration as well as other isolated areas may be required. Additionally, a situation may occur where the subgrade material at an individual footing bearing elevation is found to be both pinnacled rock and residual soils. In this situation, the bedrock should be undercut and removed an additional 2 feet below the bottom of footing and backfilled with suitable compacted engineered fill prior to construction of the footing. A detail titled "Bedrock Pinnacle Undercut Detail" indicating the required rock removal extent is attached to this letter.

The project site is located in an area underlain by carbonate rock consisting of calcareous conglomerate. The carbonate rock in this area can form karst topography with highly variable rock surfaces due to solutional weathering over long periods of time. Therefore, some risk of sinkhole development does exist for the site given its geologic location. It is our opinion that the above recommendations provide a reasonable amount of protection for the structure given the potential for sinkhole development; however, complete elimination of sinkhole risk is not practical.

Closing

This letter report has been prepared for your use, and for the use of other design professionals in the design and construction planning for this project. Any changes in the design, or information regarding the location of the structure, should be brought to our attention in order that we may determine any effect on the recommendations presented in this report. We recommend that we be given the opportunity to review the grading plan drawings once they are available, in order that we may provide more specific recommendations for design and construction of the proposed structure. Additional comments and recommendations that may apply can be provided at that time.

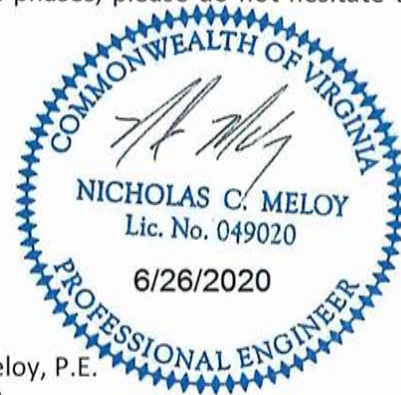
We appreciate the opportunity to be of continued service to Talbert & Bright on this project. If you have any questions concerning the information and recommendations contained in this letter report, or if we may be of further assistance to you in planning and/or construction phases, please do not hesitate to contact us.

Respectfully,

ECS MID-ATLANTIC, LLC



James N. Swiggett, P.E.
Senior Project Engineer



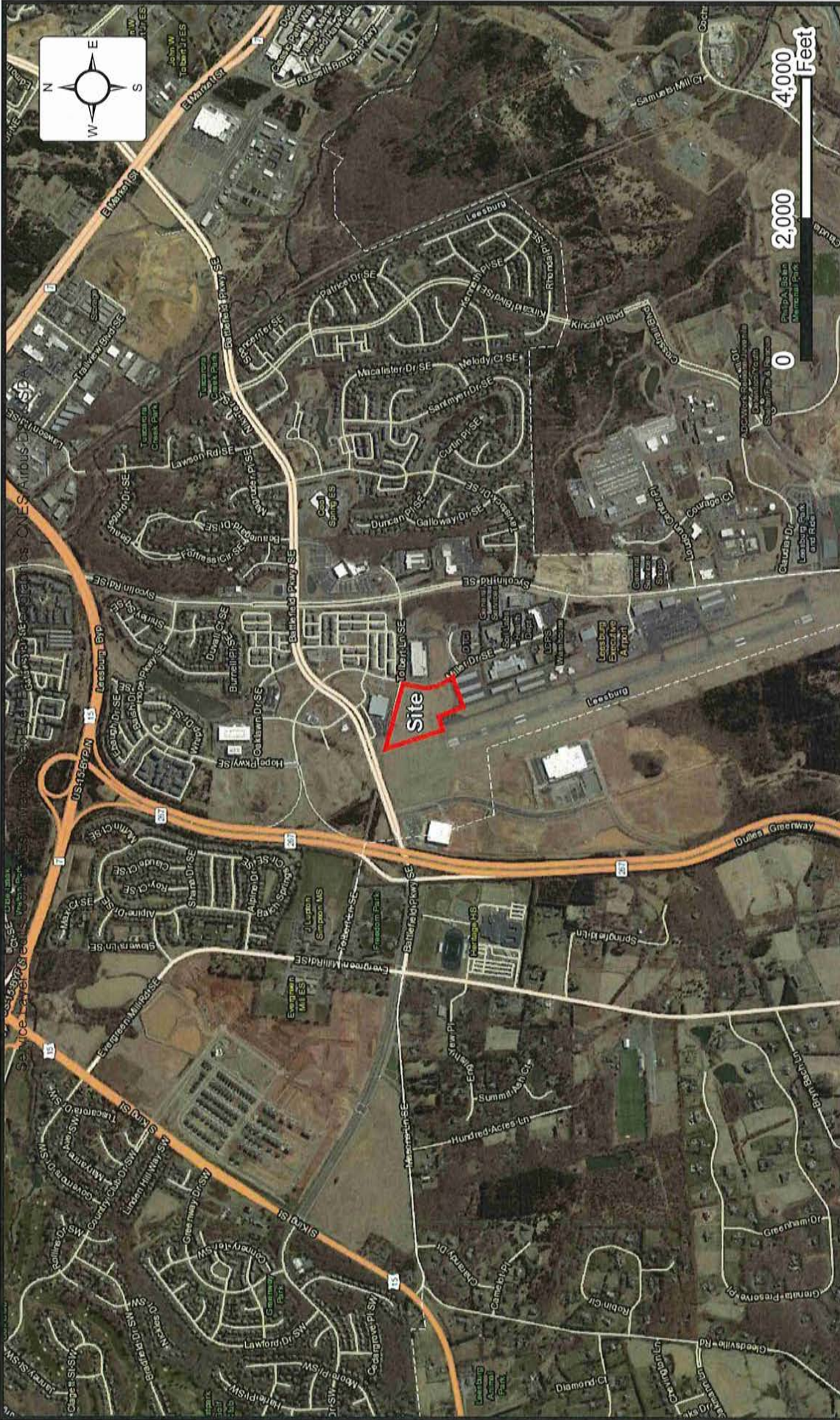
Nicholas C. Meloy, P.E.
Principal Engineer



Johnathan R. Garber, C.P.G.
Project Geologist

Attachments:

- Site Location Diagram
- Boring Location Diagram
- Geology Mapping Diagram
- Soils Mapping Diagram
- Boring Log Z-1
- Rock Core Photograph
- Electrical Resistivity Imaging Profiles
- Laboratory Summary Sheet
- Liquid and Plastic Limits Report
- Particle Size Distribution Report
- Bedrock Pinnacle Undercut Detail



ENGINEER	NCM
SCALE	1" = 2000'
PROJECT NO.	01:29694-A
SHEET	1 OF 1
DATE	6/19/2020

Site Location Diagram

NORTH APRON DEVELOPMENT - ADDITIONAL EXPLORATION

SYCOLIN ROAD, LEESBURG, VIRGINIA
TALBERT & BRIGHT



**NORTH APRON DEVELOPMENT
- ADDITIONAL EXPLORATION
LEESBURG, VA**



**BORING LOCATION
DIAGRAM
TALBERT & BRIGHT**

ECS REVISIONS

ENGINEER	DRAFTING
JS	RAC
SCALE	1"=80'
PROJECT NO.	29694-A
SHEET	1
DATE	06/17/2020

TOPOGRAPHIC REFERENCE:
DIAGRAMS WERE DEVELOPED FROM THE SITE PLAN PROVIDED
BY TALBERT & BRIGHT, THE PROJECT CIVIL ENGINEER.
THESE ELEVATIONS ARE REPORTED BY TALBERT & BRIGHT
AT A CONTOUR INTERVAL OF 1FT.

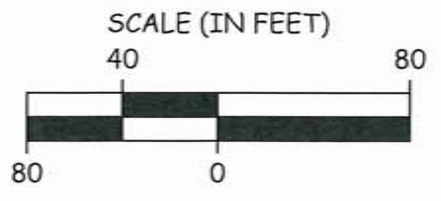
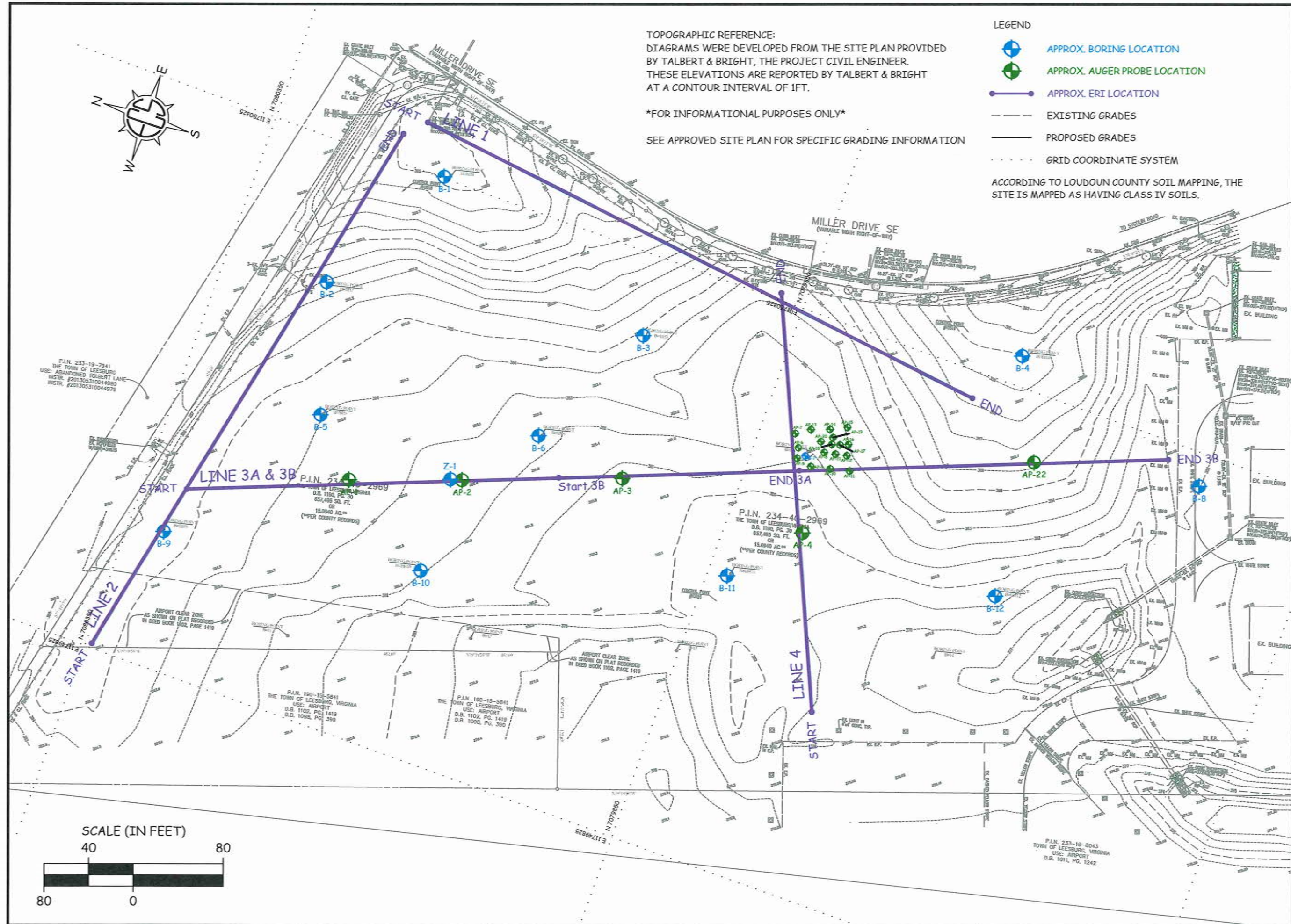
FOR INFORMATIONAL PURPOSES ONLY

SEE APPROVED SITE PLAN FOR SPECIFIC GRADING INFORMATION

LEGEND

- APPROX. BORING LOCATION
- APPROX. AUGER PROBE LOCATION
- APPROX. ERI LOCATION
- EXISTING GRADES
- PROPOSED GRADES
- GRID COORDINATE SYSTEM

ACCORDING TO LOUDOUN COUNTY SOIL MAPPING, THE
SITE IS MAPPED AS HAVING CLASS IV SOILS.



**NORTH APRON DEVELOPMENT
- ADDITIONAL EXPLORATION
LEESBURG, VA**



**GEOLOGY MAPPING
DIAGRAM
TALBERT & BRIGHT**

ECS REVISIONS

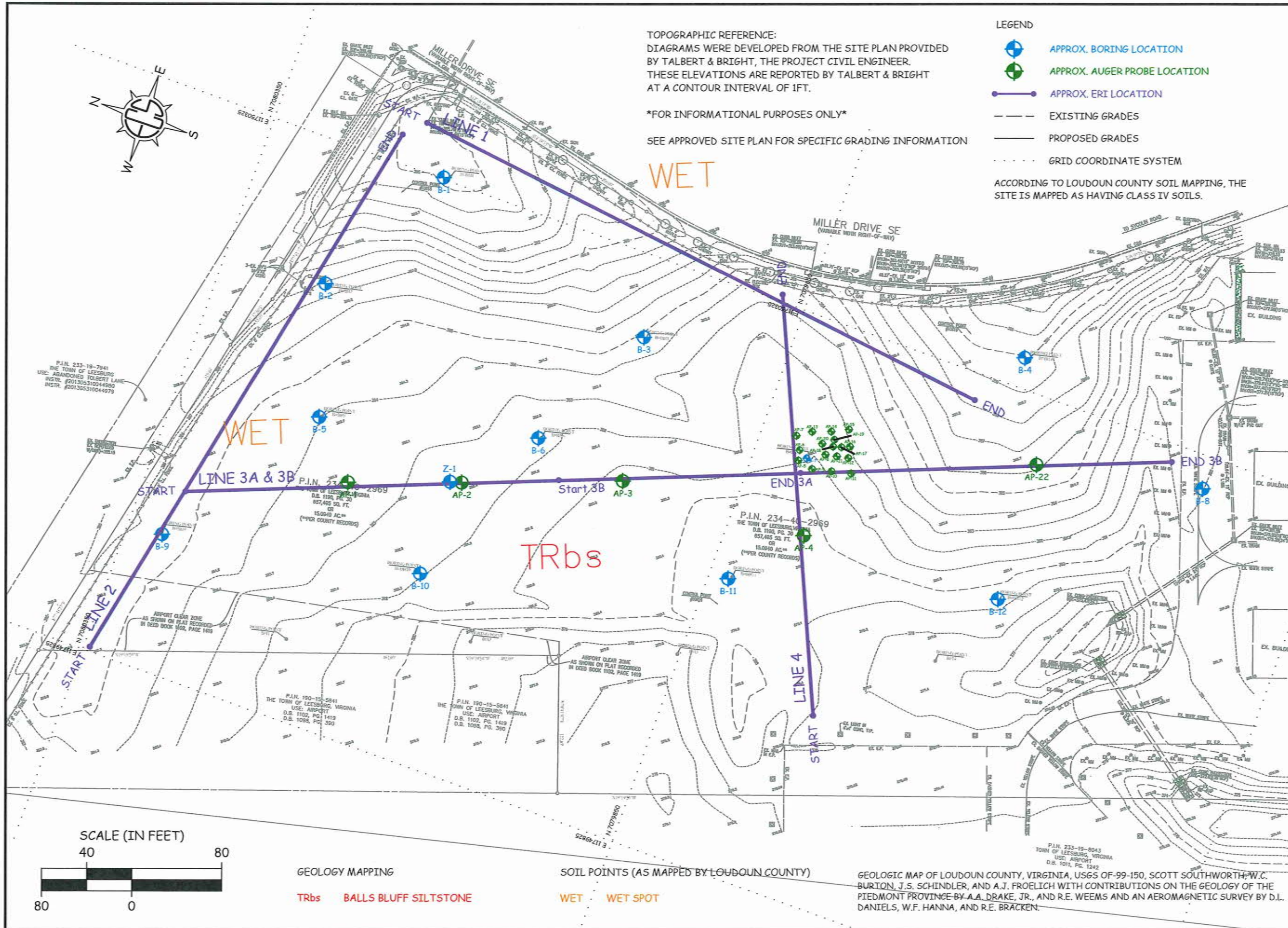
ENGINEER JS DRAFTING RAC

SCALE 1"=80'

PROJECT NO. 29694-A

SHEET 2

DATE 06/17/2020



TOPOGRAPHIC REFERENCE:
DIAGRAMS WERE DEVELOPED FROM THE SITE PLAN PROVIDED
BY TALBERT & BRIGHT, THE PROJECT CIVIL ENGINEER.
THESE ELEVATIONS ARE REPORTED BY TALBERT & BRIGHT
AT A CONTOUR INTERVAL OF 1FT.

FOR INFORMATIONAL PURPOSES ONLY

SEE APPROVED SITE PLAN FOR SPECIFIC GRADING INFORMATION

- LEGEND**
- APPROX. BORING LOCATION
 - APPROX. AUGER PROBE LOCATION
 - APPROX. ERI LOCATION
 - EXISTING GRADES
 - PROPOSED GRADES
 - GRID COORDINATE SYSTEM

ACCORDING TO LOUDOUN COUNTY SOIL MAPPING, THE
SITE IS MAPPED AS HAVING CLASS IV SOILS.

GEOLOGY MAPPING SOIL POINTS (AS MAPPED BY LOUDOUN COUNTY)

TRbs BALLS BLUFF SILTSTONE WET WET SPOT

GEOLOGIC MAP OF LOUDOUN COUNTY, VIRGINIA, USGS OF-99-150, SCOTT SOUTHWORTH, W.C. BURTON, J.S. SCHINDLER, AND A.J. FROELICH WITH CONTRIBUTIONS ON THE GEOLOGY OF THE PIEDMONT PROVINCE BY A.A. DRAKE, JR., AND R.E. WEEMS AND AN AEROMAGNETIC SURVEY BY D.L. DANIELS, W.F. HANNA, AND R.E. BRACKEN.

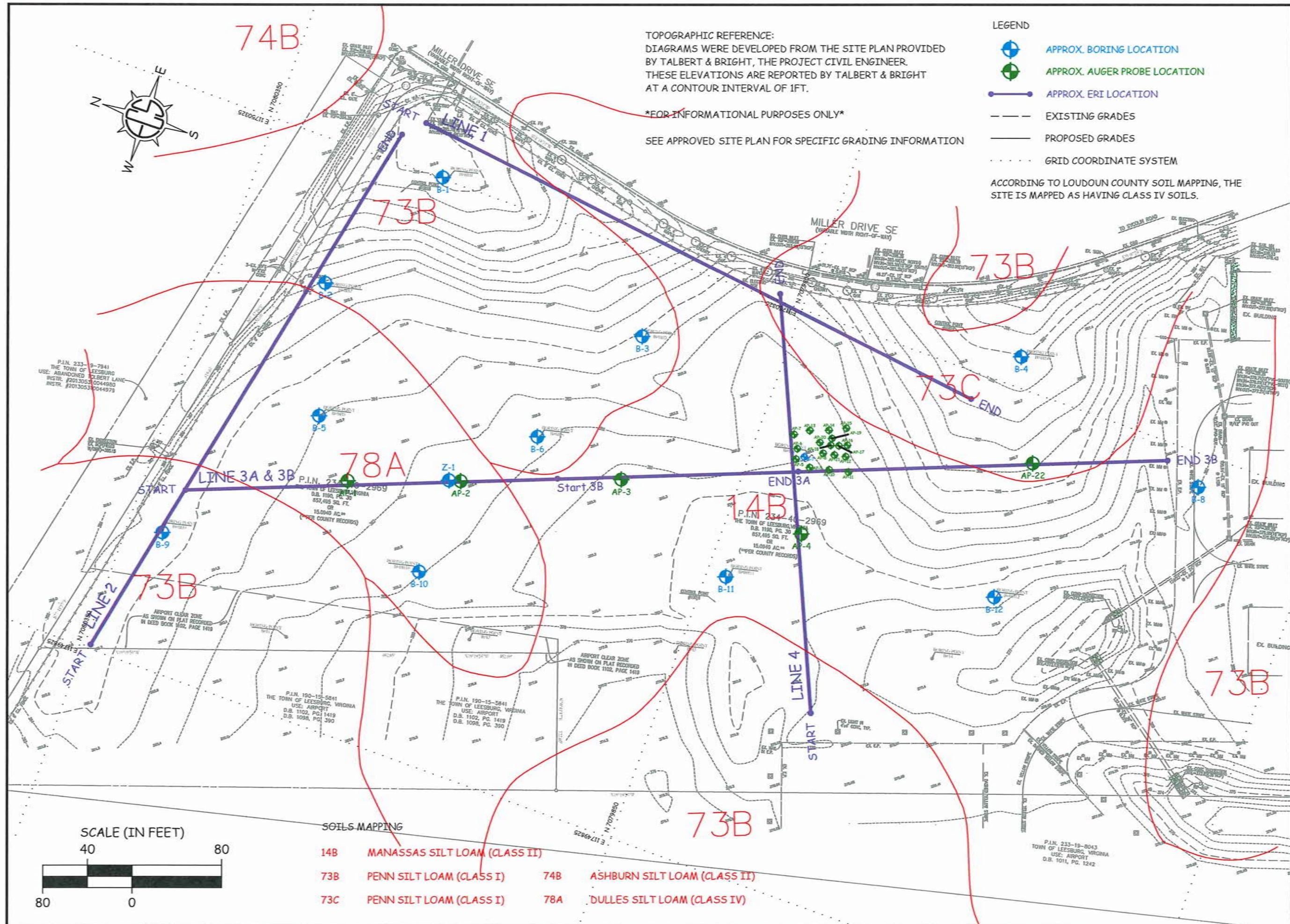
**NORTH APRON DEVELOPMENT
- ADDITIONAL EXPLORATION
LEESBURG, VA**



**SOILS MAPPING
DIAGRAM
TALBERT & BRIGHT**

ECS REVISIONS

ENGINEER	DRAFTING
JS	RAC
SCALE	1"=80'
PROJECT NO.	29694-A
SHEET	3
DATE	06/17/2020

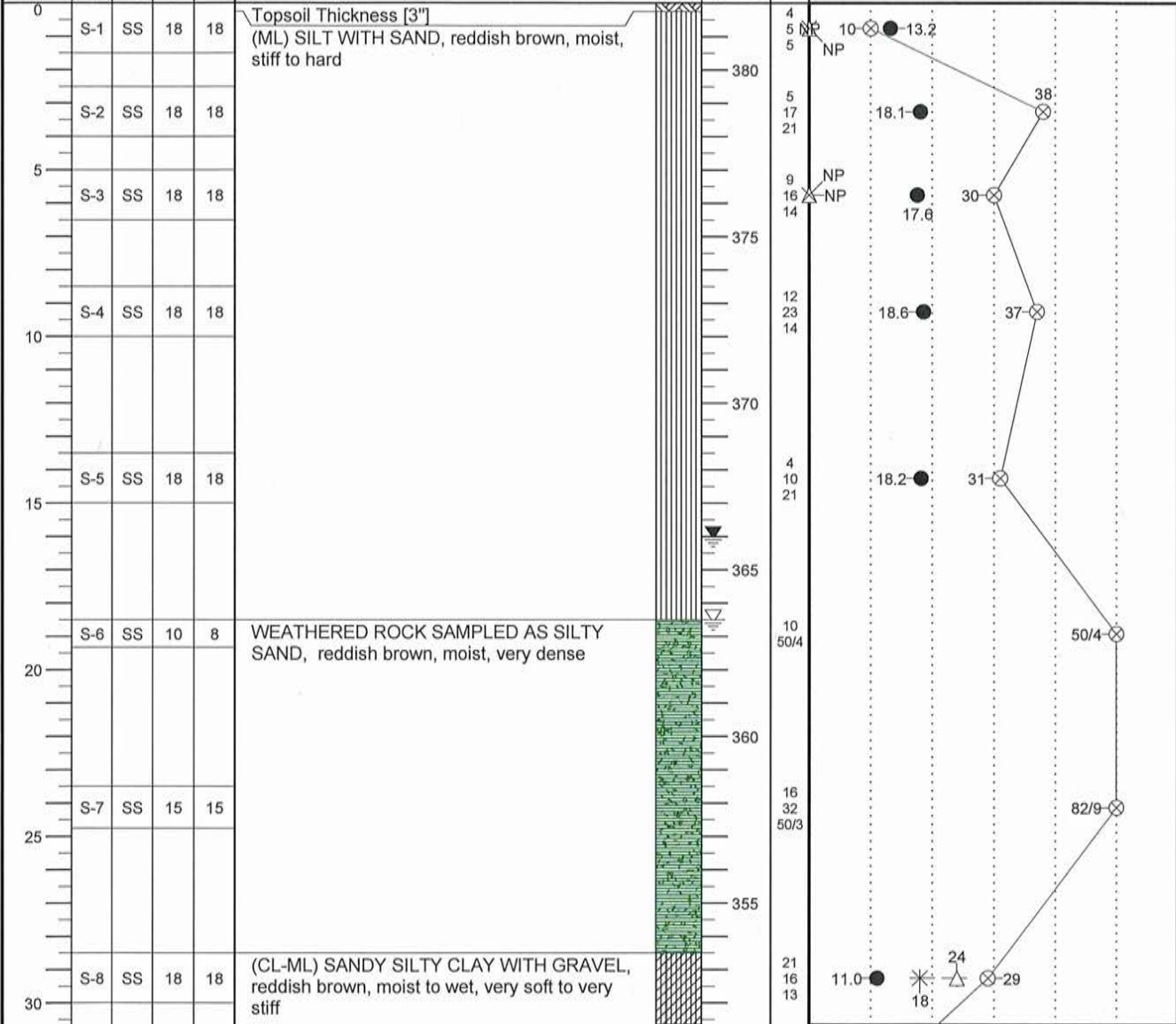


CLIENT Talbert & Bright	Job #. 01:29694-A	BORING # Z-1	SHEET 1 OF 3	
PROJECT NAME North Apron Development - Additional Exploration	ARCHITECT-ENGINEER Talbert & Bright			

SITE LOCATION
Sycolin Road, Leesburg, Loudoun County, VA

NORTHING	EASTING	STATION
----------	---------	---------

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	ENGLISH UNITS	WATER LEVELS ELEVATION (FT)	BLOWS/6"
					BOTTOM OF CASING	LOSS OF CIRCULATION		



CONTINUED ON NEXT PAGE.

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL.					
WL 18.5'	WS <input type="checkbox"/>	WD <input checked="" type="checkbox"/>	BORING STARTED	05/29/20	CAVE IN DEPTH 24.0'
WL(SHW)	WL(ACR) 16.0'		BORING COMPLETED	06/02/20	HAMMER TYPE Auto
WL			RIG D-50 ATV	FOREMAN J. Lewis Fink	DRILLING METHOD 3.25HSA

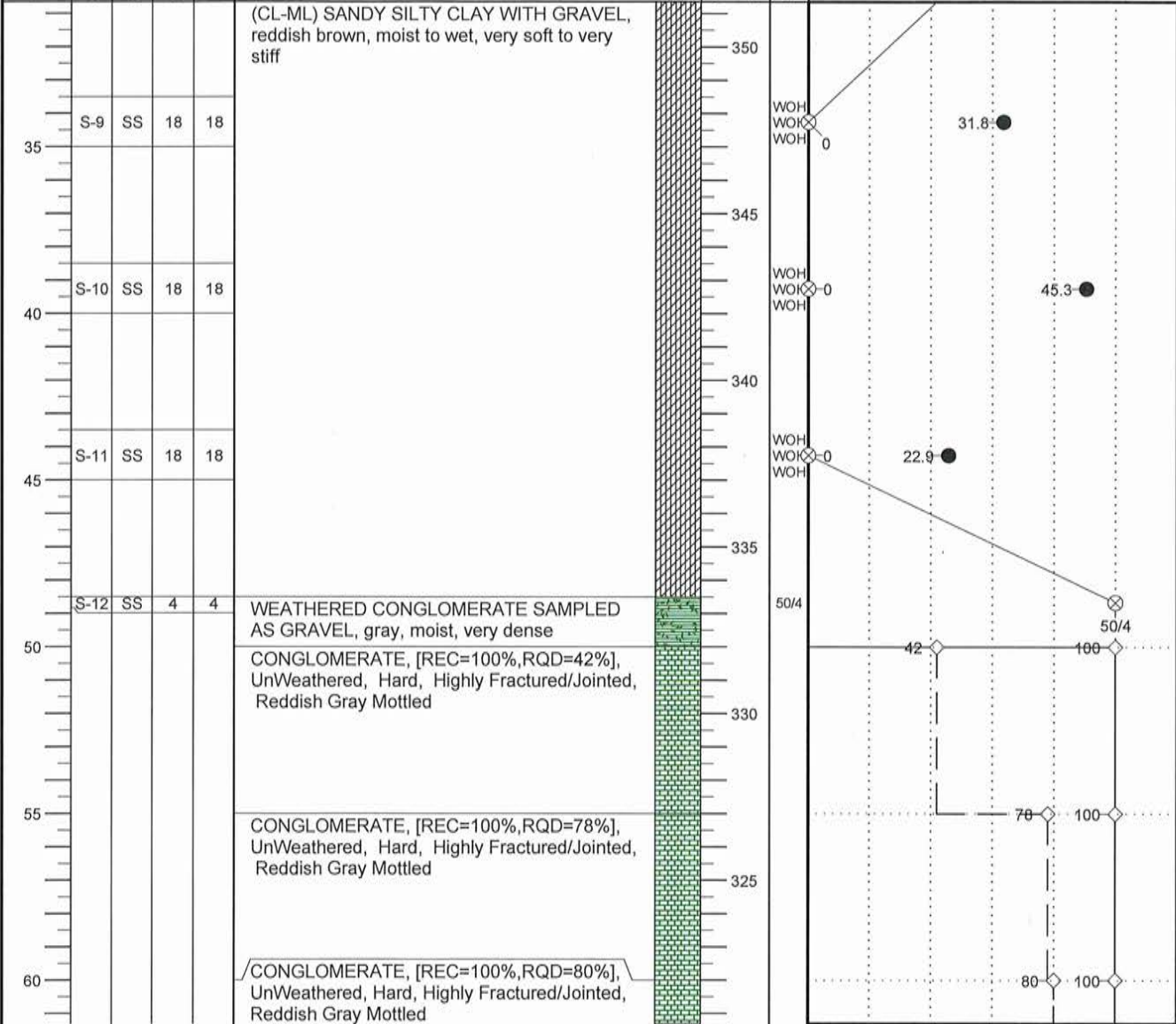
CLIENT Talbert & Bright	Job #. 01:29694-A	BORING # Z-1	SHEET 2 OF 3	
PROJECT NAME North Apron Development - Additional Exploration	ARCHITECT-ENGINEER Talbert & Bright			

SITE LOCATION
Sycolin Road, Leesburg, Loudoun County, VA

NORTHING	EASTING	STATION
----------	---------	---------

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	ENGLISH UNITS	WATER LEVELS ELEVATION (FT)	BLOWS/6"
					BOTTOM OF CASING	LOSS OF CIRCULATION		
SURFACE ELEVATION 382								

○ CALIBRATED PENETROMETER TONS/FT²
 ROCK QUALITY DESIGNATION & RECOVERY
 RQD% - - - REC% - - -
 PLASTIC LIMIT% WATER CONTENT% LIQUID LIMIT%
 X ● △
 ⊗ STANDARD PENETRATION BLOWS/FT




CONTINUED ON NEXT PAGE.


THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL.

WL 18.5'	WS □	WD ⊗	BORING STARTED 05/29/20	CAVE IN DEPTH 24.0'
WL(SHW)	WL(ACR) 16.0'		BORING COMPLETED 06/02/20	HAMMER TYPE Auto
WL			RIG D-50 ATV FOREMAN J. Lewis/J. Fink	DRILLING METHOD 3.25HSA

CLIENT Talbert & Bright	Job #: 01:29694-A	BORING # Z-1	SHEET 3 OF 3	
PROJECT NAME North Apron Development - Additional Exploration	ARCHITECT-ENGINEER Talbert & Bright			

SITE LOCATION
Sycolin Road, Leesburg, Loudoun County, VA

NORTHING	EASTING	STATION
ROCK QUALITY DESIGNATION & RECOVERY RQD% - - - REC% - - -		
PLASTIC LIMIT% WATER CONTENT% LIQUID LIMIT% 		
⊗ STANDARD PENETRATION BLOWS/FT		

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	ENGLISH UNITS	WATER LEVELS ELEVATION (FT)	BLOWS/6"
					BOTTOM OF CASING	▶		
					LOSS OF CIRCULATION	▶		
					SURFACE ELEVATION	382		
65					CONGLOMERATE, [REC=100%,RQD=80%], UnWeathered, Hard, Highly Fractured/Jointed, Reddish Gray Mottled		320	
					END OF BORING @ 65'			
70								
75								
80								
85								
90								

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL.

WL 18.5'	WS <input type="checkbox"/> WD <input checked="" type="checkbox"/>	BORING STARTED	05/29/20	CAVE IN DEPTH	24.0'
WL(SHW)	WL(ACR) 16.0'	BORING COMPLETED	06/02/20	HAMMER TYPE	Auto
WL		RIG	D-50 ATV	FOREMAN	J. Lewis/J. Fink
				DRILLING METHOD	3.25HSA



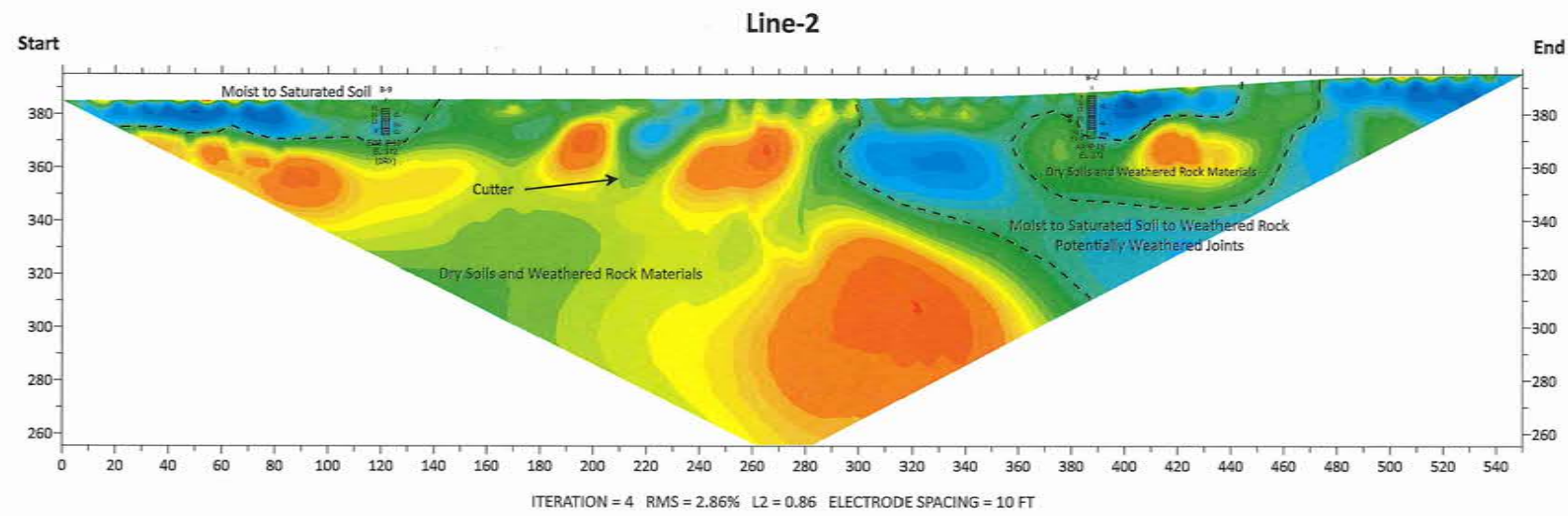
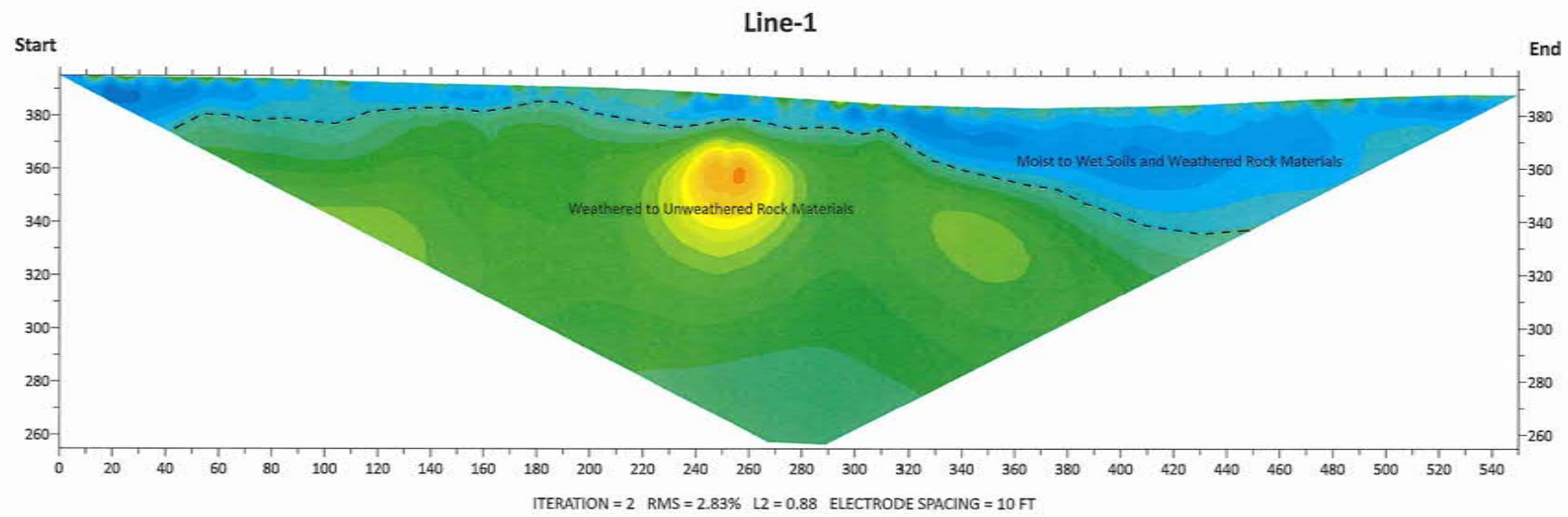
North Apron Development
 Town of Leesburg, Loudoun County, Virginia
 ECS# 01:29694-A
 Boring No. Z-1

Run	Top Depth (ft)	Bottom Depth (ft)	Length (ft)	REC (in/%)	RQD (in/%)
1	50.0	55.0	5.0	60"/100%	25"/42%
2	55.0	60.0	5.0	60"/100%	47"/78%
3	60.0	65.0	5.0	60"/100%	48"/80%



Date: 6/26/2020

Box 1 of 1



NOTES

- 1) ARRAY = DIPOLE-DIPOLE/SLUMBERGER
- 2) EQUIPMENT = AGI SUPERSTING R8
- 3) ELECTRODE SPACING (ES) = 10 FT

MODELED RESISTIVITY (Ω -m)

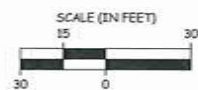


LEGEND

- - - - - APPROX. BASE OF COLLUVIAL STRATUM
- — — — APPROX. TOP OF BEDROCK

Legend

- AP
- Weathered Rock/
Rock Encountered
- Refusal



T:\Users\jg\Documents\29694-A\Leesburg Apron\Additional Explorations\ERI\29694-A_Line1.apr_06/24/2020 11:19:44

CELEBRATING
OVER 30 YEARS
OF EXCELLENCE

ECS - MID-ATLANTIC, LLC
1425 THUNDERBOLT PLAZA
SUITE 100
CHANTILLY, VA 20151
1-800-827-3489
(703) 701-8487

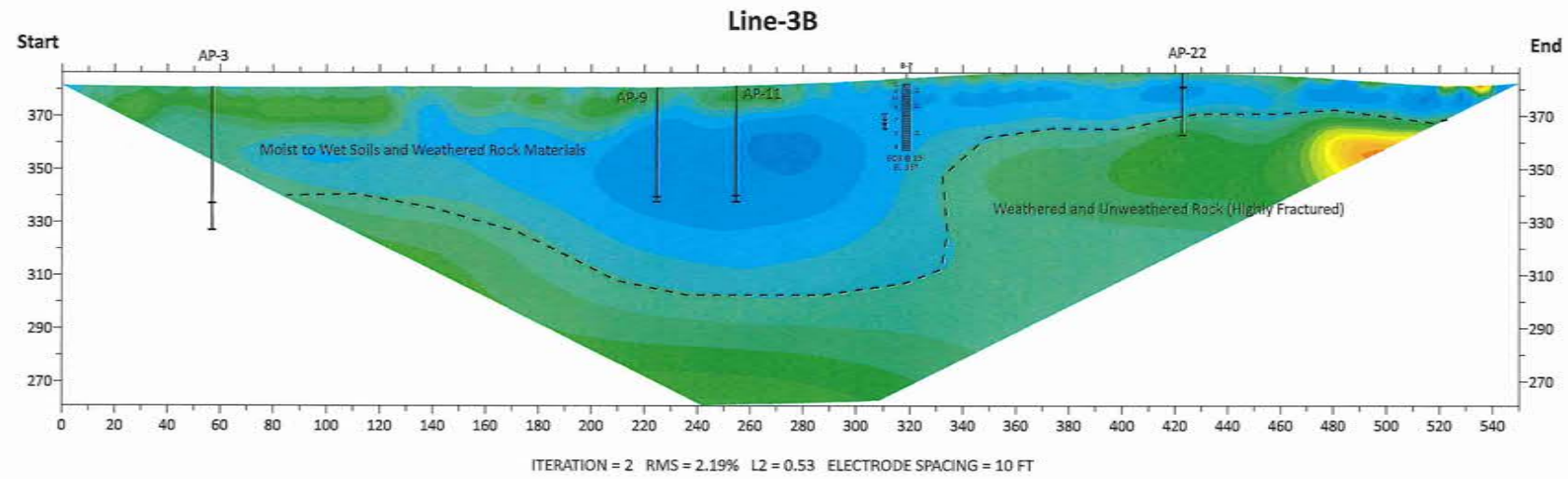
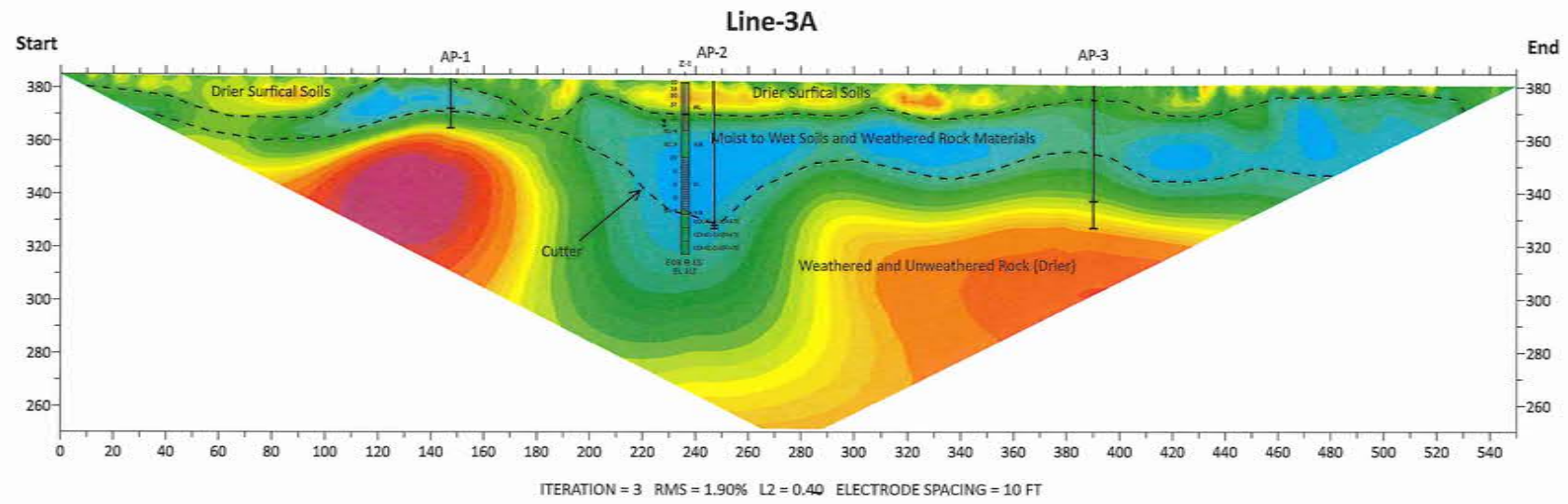
"SETTING THE STANDARD FOR SERVICE"



**NORTH APRON DEVELOPMENT
ERI SURVEY LINES
LEESBURG, VA**

**ELECTRICAL RESISTIVITY
IMAGING PROFILES
LINE 1 & LINE 2**

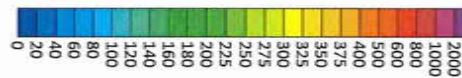
ECS REVISIONS	
ENGINEER JS	DRAFTING RAC
SCALE 1"=30'	
PROJECT NO. 29694-A	
SHEET 1	
DATE 06/24/2020	



NOTES

- 1) ARRAY = DIPOLE-DIPOLE/SLUMBERGER
- 2) EQUIPMENT = AGI SUPERSTING R8
- 3) ELECTRODE SPACING (ES) = 10 FT

MODELED RESISTIVITY (Ω -m)



LEGEND

- - - - - APPROX. BASE OF COLLUVIAL STRATUM
- — — — — APPROX. TOP OF BEDROCK

Legend

- AP
- Weathered Rock/
Rock Encountered
- Refusal



CELEBRATING
OVER 30 YEARS
OF EXCELLENCE

ECS - MID-ATLANTIC, LLC
1024 THUNDERBOLT PLACE
CHARLOTTE, VA 20011
703.871.4400
(FAX) 703.874.8827



**NORTH APRON DEVELOPMENT
ERI SURVEY LINES
LEESBURG, VA**

**ELECTRICAL RESISTIVITY
IMAGING PROFILES
LINE 3A & LINE 3B**

ECS REVISIONS

ENGINEER JS DRAFTING RAC

SCALE 1"=30'

PROJECT NO. 29694-A

SHEET 2

DATE 06/24/2020

Laboratory Testing Summary

Sample Source	Sample Number	Start Depth (feet)	End Depth (feet)	Sample Distance (feet)	MC1 (%)	Soil Type ²	Atterberg Limits ³			Percent Passing No. 200 Sieve ⁴	Moisture - Density (Corr.) ⁵		CBR Value ⁶	Other
							LL	PL	PI		Maximum Density (pcf)	Optimum Moisture (%)		
Z-1	S-1	0.0	1.5	1.5	13.2	ML	NP	NP	NP	74.8				
	S-2	2.5	4.0	1.5	18.1									
	S-3	5.0	6.5	1.5	17.6	ML	NP	NP	NP	77.3				
	S-4	8.5	10.0	1.5	18.6									
	S-5	13.5	15.0	1.5	18.2									
	S-8	28.5	30.0	1.5	11.0	CL-ML	24	18	6	58.4				
	S-9	33.5	35.0	1.5	31.8									
	S-10	38.5	40.0	1.5	45.3									
	S-11	43.5	45.0	1.5	22.9									

Notes: 1. ASTM D 2216, 2. ASTM D 2487, 3. ASTM D 4318, 4. ASTM D 1140, 5. See test reports for test method, 6. See test reports for test method

Definitions: MC: Moisture Content, Soil Type: USCS (Unified Soil Classification System), LL: Liquid Limit, PL: Plastic Limit, PI: Plasticity Index, CBR: California Bearing Ratio, OC: Organic Content (ASTM D 2974)

Project No. 01:29694-A

Project Name: North Apron Development - Additional Exploration

PM: James N. Swiggett

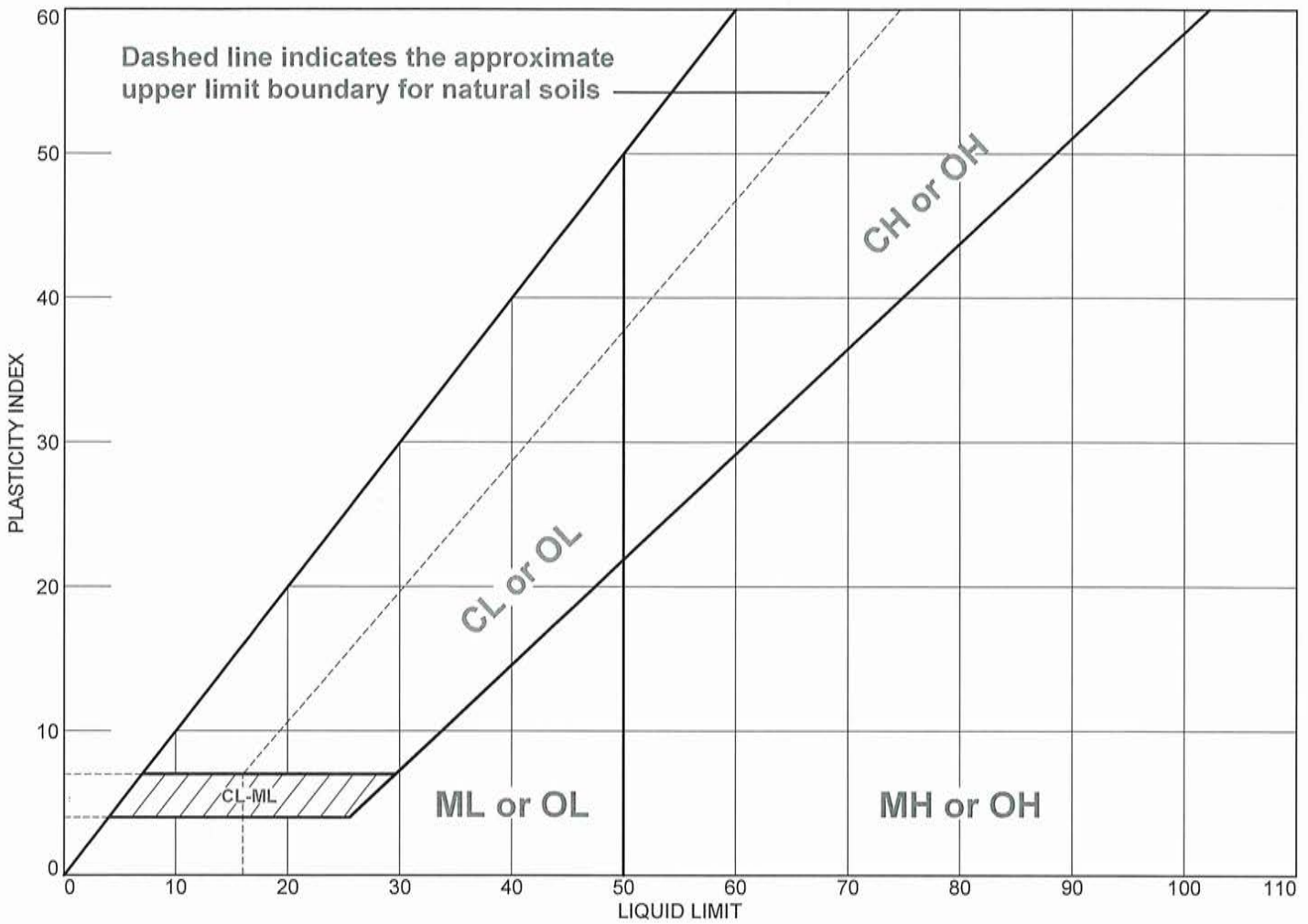
PE: Nicholas C. Meloy

Printed On: Tuesday, June 16, 2020



ECS MID-ATLANTIC, LLC
 14026 Thunderbolt Place, Suite 100
 Chantilly, VA 20151-3232
 Phone: (703) 471-8400
 Fax: (703) 834-5527

LIQUID AND PLASTIC LIMITS TEST REPORT



	Material Description	Sampled	Tested	Technician	LL	PL	PI	%<#40	USCS
●	SILT WITH SAND, trace mica, dark reddish brown			KV	NP	NP	NP	99.8	ML
■									
▲	SILT WITH SAND, trace mica, dark reddish brown				NP	NP	NP	98.8	ML
◆									
▼									

Project No. 29694-A **Client:** Talbert & Bright
Project: North Apron Development - Additional Exploration

○ **Source of Sample:** Z-1 **Depth:** 0 **Sample Number:** S-1

△ **Source of Sample:** Z-1 **Depth:** 5 **Sample Number:** S-3



ECS MID-ATLANTIC, LLC

14026 Thunderbolt Place, Suite 100
 Chantilly, VA 20151-3232

Phone: (703) 471-8400
 Fax: (703) 834-5527

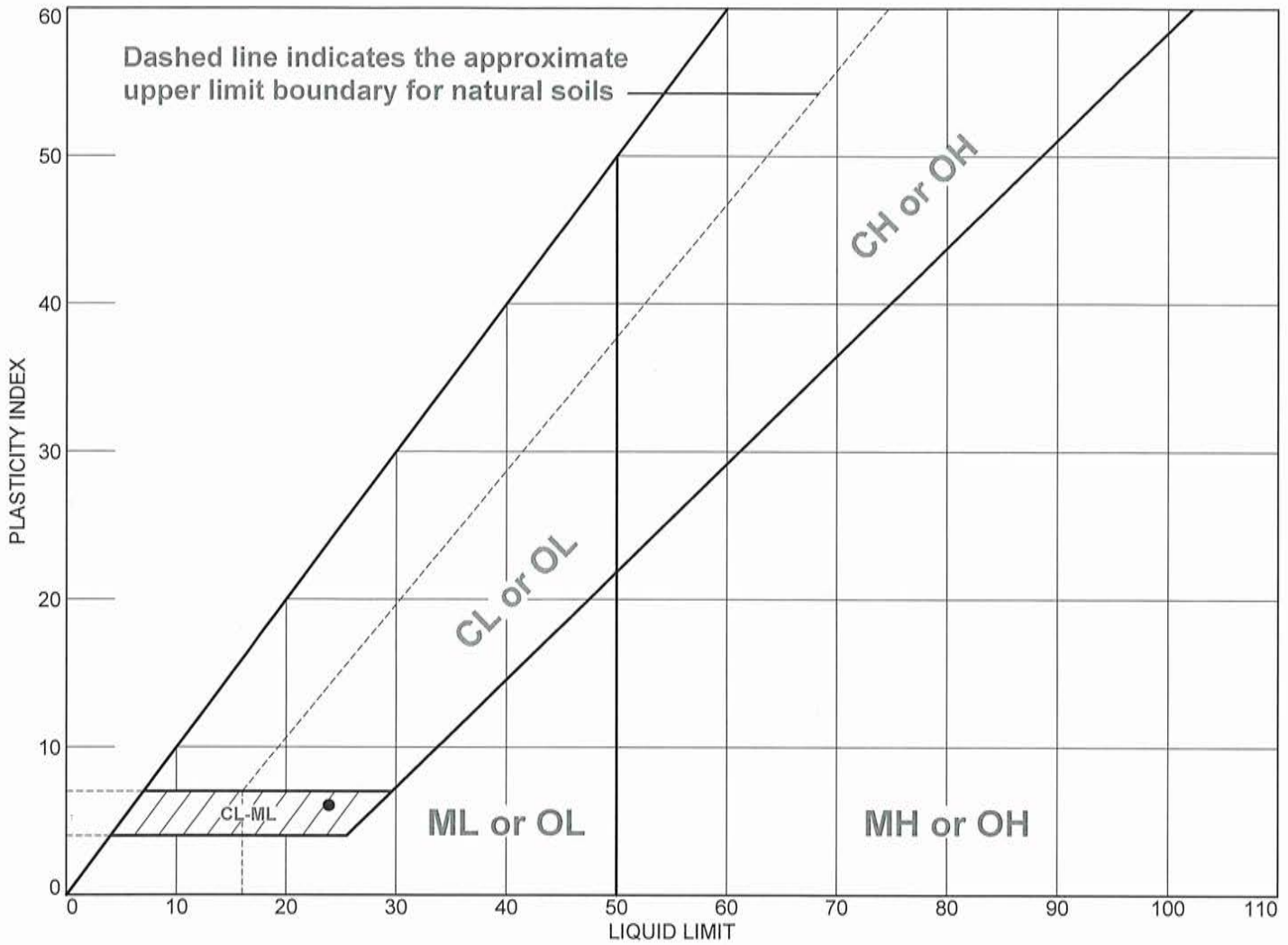
Checked by: DVT
Title:

Figure

Tested By: KV

Checked By: DVT

LIQUID AND PLASTIC LIMITS TEST REPORT



Material Description	Sampled	Tested	Technician	LL	PL	PI	%<#40	USCS
● SANDY SILTY CLAY, trace mica, dark reddish brown				24	18	6	73.1	CL-ML
■								
▲								
◆								

Project No. 29694-A **Client:** Talbert & Bright
Project: North Apron Development - Additional Exploration
 Source of Sample: Z-1 **Depth:** 28.5 **Sample Number:** S-8



ECS MID-ATLANTIC, LLC

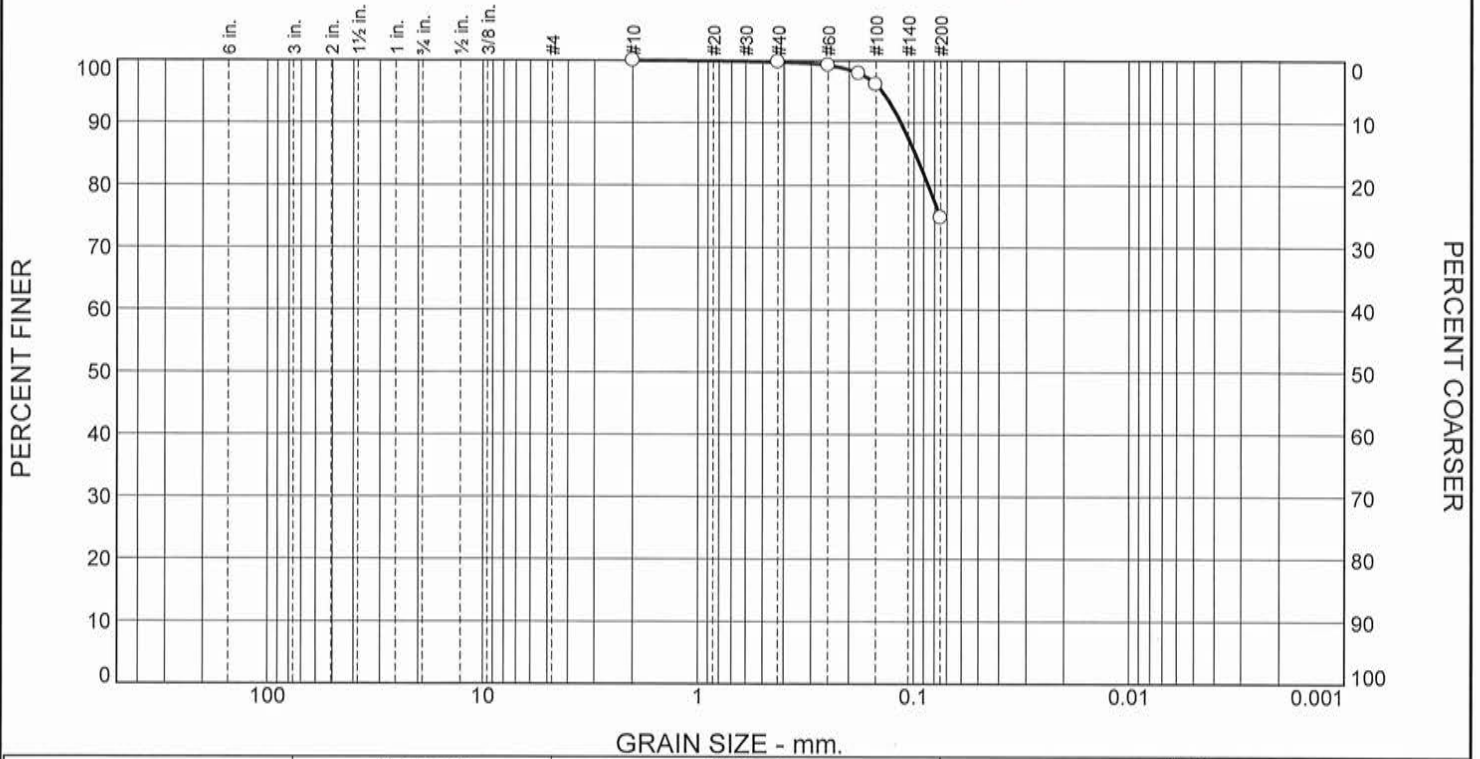
14026 Thunderbolt Place, Suite 100
 Chantilly, VA 20151-3232

Phone: (703) 471-8400
 Fax: (703) 834-5527

Checked by:
Title:

Figure

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.2	25.0	74.8	

TEST RESULTS			
Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
#10	100.0		
#40	99.8		
#60	99.3		
#80	98.0		
#100	96.2		
#200	74.8		

Material Description

SILT WITH SAND, trace mica, dark reddish brown

Atterberg Limits (ASTM D 4318)

PL= NP LL= NP PI= NP

Classification

USCS (D 2487)= ML AASHTO (M 145)= A-4(0)

Coefficients

D₉₀= 0.1146 D₈₅= 0.0984 D₆₀=
D₅₀= D₃₀= D₁₅=
D₁₀= C_u= C_c=

Remarks

Date Received: 6/9/20 Date Tested: 6/10/20

Tested By: KV

Checked By: DVT

Title: LM

* (no specification provided)

Source of Sample: Z-1 Depth: 0
Sample Number: S-1

Date Sampled:



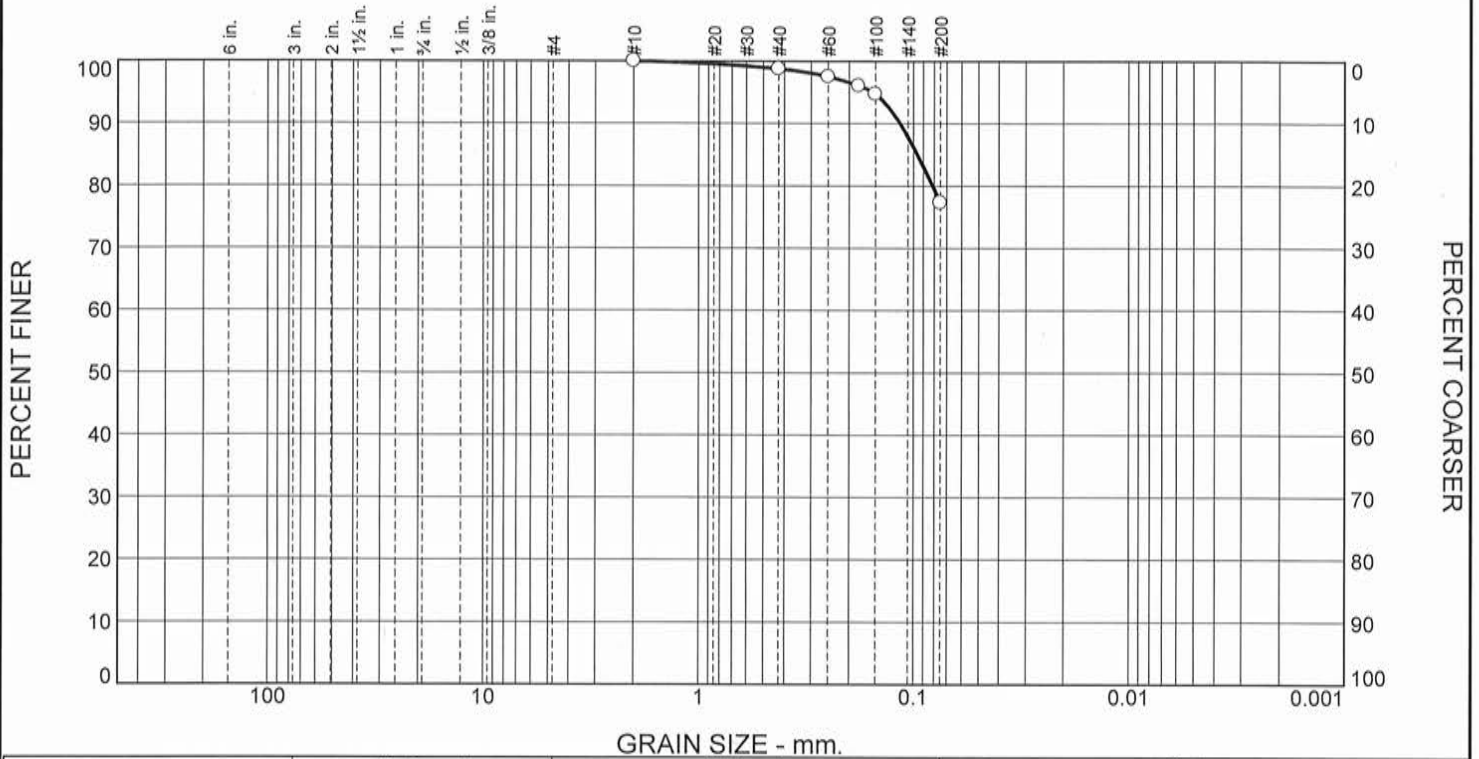
ECS MID-ATLANTIC, LLC
14026 Thunderbolt Place, Suite 100
Chantilly, VA 20151-3232
Phone: (703) 471-8400
Fax: (703) 834-5527

Client: Talbert & Bright
Project: North Apron Development - Additional Exploration

Project No: 29694-A

Figure

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	1.2	21.5	77.3	

TEST RESULTS			
Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
#10	100.0		
#40	98.8		
#60	97.5		
#80	96.1		
#100	94.7		
#200	77.3		

Material Description

SILT WITH SAND, trace mica, dark reddish brown

Atterberg Limits (ASTM D 4318)

PL= NP LL= NP PI= NP

Classification

USCS (D 2487)= ML AASHTO (M 145)= A-4(0)

Coefficients

D₉₀= 0.1154 D₈₅= 0.0959 D₆₀=
D₅₀= D₃₀= D₁₅=
D₁₀= C_u= C_c=

Remarks

Date Received: 6/9/20 Date Tested: 6/10/20

Tested By: KV

Checked By: DVT

Title: LM

* (no specification provided)

Source of Sample: Z-1
Sample Number: S-3

Depth: 5

Date Sampled:



ECS MID-ATLANTIC, LLC
14026 Thunderbolt Place, Suite 100
Chantilly, VA 20151-3232
Phone: (703) 471-8400
Fax: (703) 834-5527

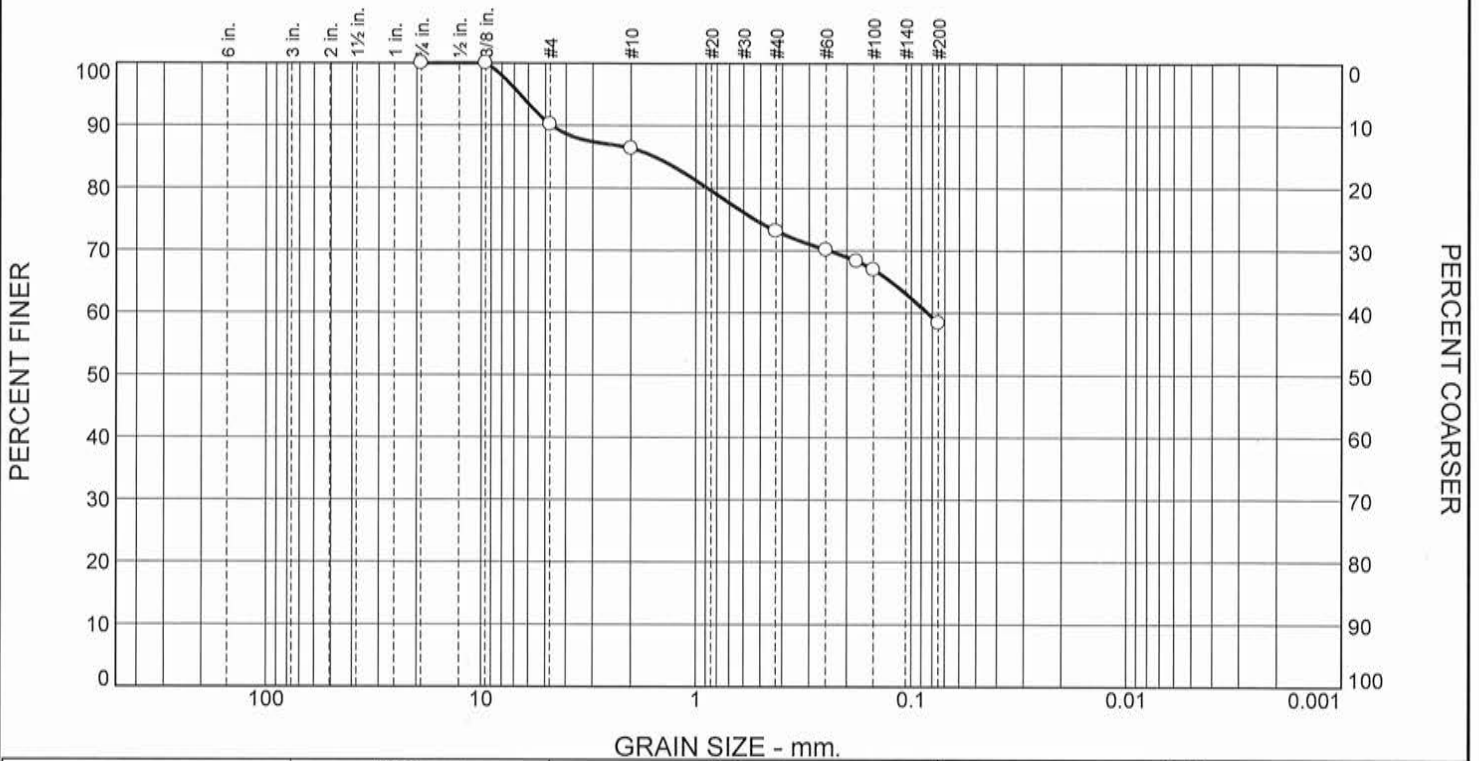
Client: Talbert & Bright

Project: North Apron Development - Additional Exploration

Project No: 29694-A

Figure

Particle Size Distribution Report



GRAIN SIZE - mm.

% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	9.8	3.8	13.3	14.7	58.4	

TEST RESULTS			
Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
0.75	100.0		
.375	100.0		
#4	90.2		
#10	86.4		
#40	73.1		
#60	70.1		
#80	68.3		
#100	66.9		
#200	58.4		

* (no specification provided)

Material Description

SANDY SILTY CLAY, trace mica, dark reddish brown

Atterberg Limits (ASTM D 4318)

PL= 18 LL= 24 PI= 6

Classification

USCS (D 2487)= CL-ML AASHTO (M 145)= A-4(1)

Coefficients

D₉₀= 4.6771 D₈₅= 1.5568 D₆₀= 0.0843
D₅₀= D₃₀= D₁₅=
D₁₀= C_u= C_c=

Remarks

Date Received: 6/9/20 Date Tested: 6/10/20

Tested By: KV

Checked By: DVT

Title: LM

Source of Sample: Z-1
Sample Number: S-8

Depth: 28.5

Date Sampled:



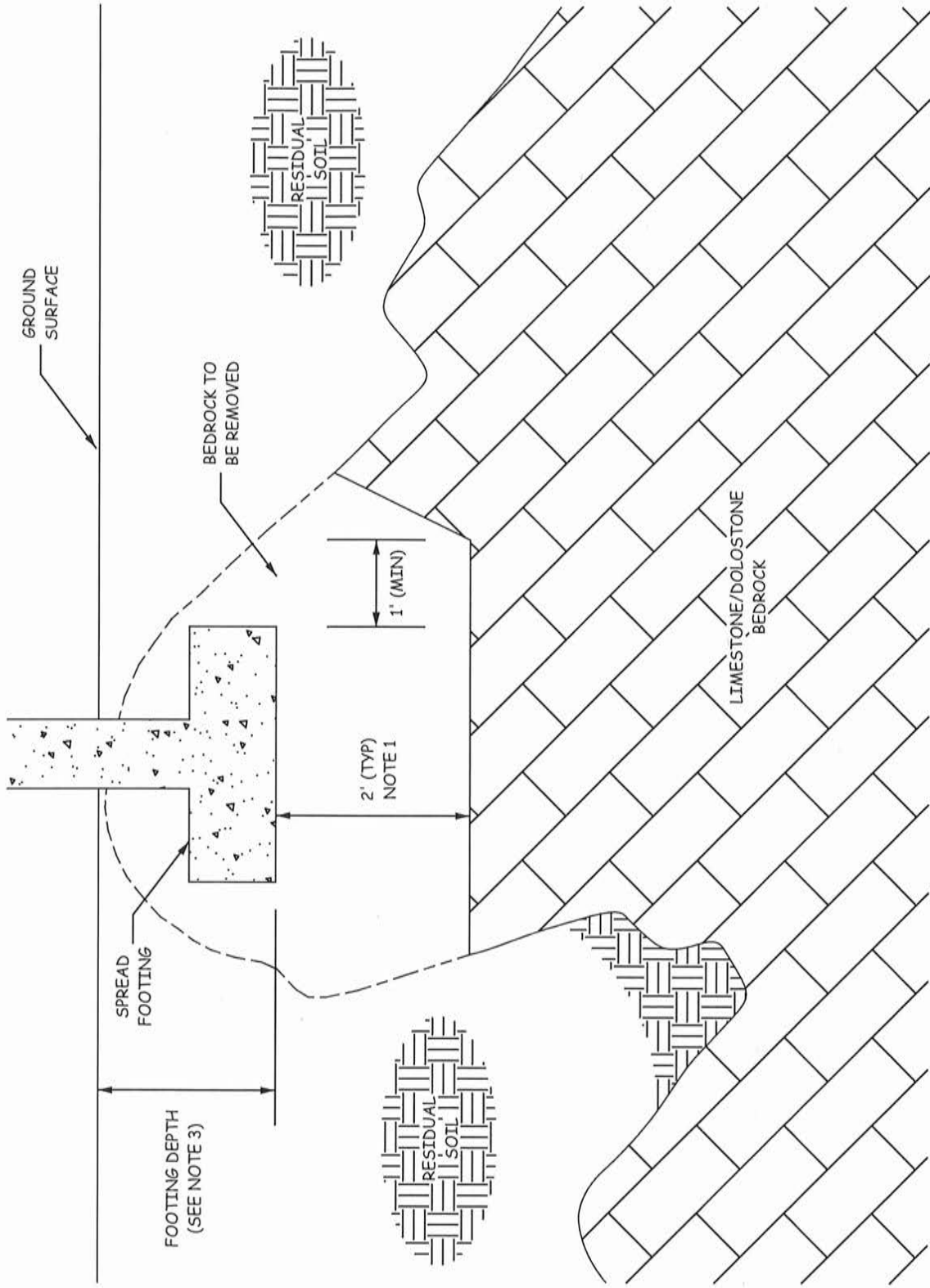
ECS MID-ATLANTIC, LLC
14026 Thunderbolt Place, Suite 100
Chantilly, VA 20151-3232
Phone: (703) 471-8400
Fax: (703) 834-5527

Client: Talbert & Bright

Project: North Apron Development - Additional Exploration

Project No: 29694-A

Figure



BEDROCK PINNACLE UNDERCUT DETAIL

NTS

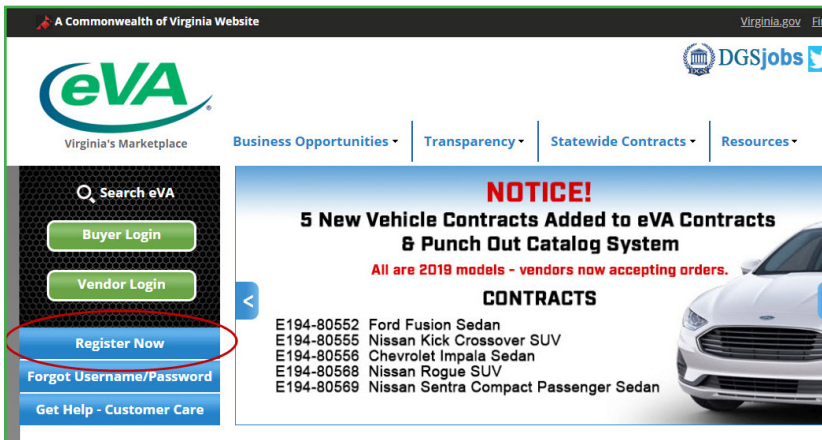
NOTES:

- 1) BACKFILL BEDROCK UNDERCUT WITH SUITABLE ENGINEERED FILL COMPACTED TO 95 PERCENT OF THE MAXIMUM DRY DENSITY AS DETERMINED USING ASTM D6998-12.
- 2) SHEAR LOADING SHOULD BE EVALUATED DURING FOUNDATION DESIGN.
- 3) FOOTING DEPTH SHOULD BE 2.5 FEET MINIMUM IF HIGHLY PLASTIC SOILS ARE PRESENT, FOOTING SHOULD BE PLACED AT LEAST 4 FEET BELOW FINAL EXTERIOR GRADE.



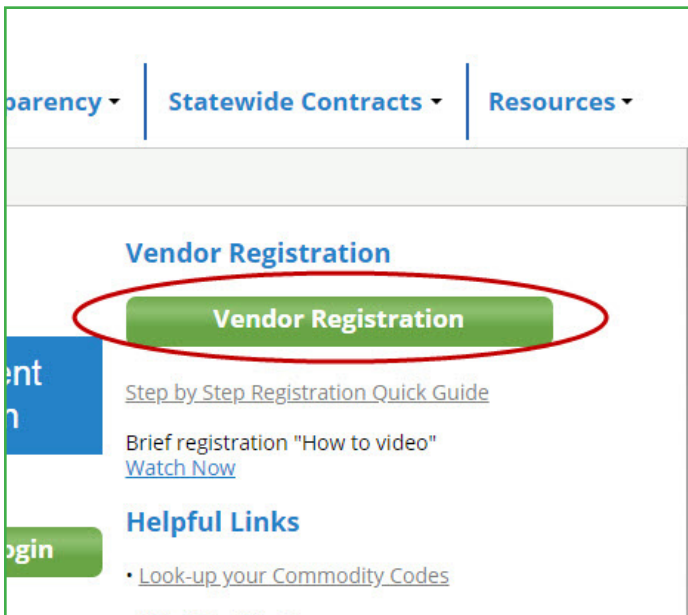
Step by Step Vendor Registration Instructions

Start by clicking the *Register Now* link on the eVA website homepage (www.eVA.virginia.gov).



Registration Checklist

1. **Company name** – Be sure to list a name that buyers will easily recognize.
2. **Federal Tax Identification Number (TIN)** – The 9 digit TIN or Social Security number that identifies your organization.
3. **Addresses & Contact information**
You will need street and/or PO box addresses, phone & fax numbers, and email addresses for orders, payments, bills, solicitations (business opportunities), and physical location.
4. **Commodity Codes** – Describes to buyers what your company sells. Use the *NIGP Code Look Up* link on the left hand menu of the eVA home page.



You can either begin a **New Registration**

Or you can choose **Add Location** or **Change Registration Type** to update an existing account

Search for your company location

Has your company done business with us in the past? If so, your company may already be in our database. Please use search.

Company Name:

Is your company listed ?

Yes, I found my Headquarters but not my Location → Click **Add Location** to create new Location for the existing Headq

Yes, my Account is activated but I don't know the login → Call Customer Care @ 1-866-289-7367 for help.

No, Register Now →

Headquarter Standard Name	Location Name	HQ Account	Registration Type	
Team MX	Tomahawk	No	Self-Registered	Add Location
Tom Gilbert	Michigan	Yes	Self-Registered	Add Location
Tom Tom Inc	Tom Tom Inc	Yes	Self-Registered	Add Location
✓ Tom's Taxidermy	HQ	Yes	State-Entered	Change Registration Type Add Location

For a new registration, you will start the registration process by reviewing & accepting eVA's Memorandum of Agreement then entering your company's EIN or SSN number.

eVA Memorandum Of Agreement (Effective 5/16/2006)

Thank you for joining the Commonwealth of Virginia eVA supplier community. You must agree to the terms defined below in order to:

- continue with the eVA registration process.
- avoid having an existing registration deactivated/canceled.

You are strongly encouraged to click on the "help & advice" button for more information.

This Memorandum Of Agreement (Agreement) sets forth the terms that have been established by the Commonwealth of Virginia, Department and Supply ("DPS") to govern all electronic procurement transactions made between your firm ("Vendor") and any agency or public body made, in whole or in part, utilizing the Commonwealth of Virginia's web-centric statewide electronic procurement solution (eVA).

For purposes of this Agreement:

- electronic procurement transaction is defined to include electronic quotations, bids, proposals, purchase orders, contracts, invoice procurement information, instruments and notices electronically transmitted, received, or posted using eVA in lieu of or in addition to paper.
- agency is defined as any department, authority, board, post, commission, division, institution, or office of State government of the Commonwealth of Virginia.
- public body is defined as any legislative, executive or judicial body, agency, office, department, authority, post, commission, committee, or board created by law in Virginia to exercise some sovereign power or to perform some governmental duty, and empowered by law to use eVA.
- eVA Fee Schedule is defined as a listing of eVA registration, transaction, and other fees (eVA fees) that are assessed to eVA users and published on the eVA Website. Each fee set forth on the eVA Fee Schedule is effective dated so eVA users, including Vendors, can

Provide the following and continue

Taxpayer ID & Type: EIN SSN

Company Zip:

Department of General Services • Division of Purchases and Supply • eProcurement Bureau
 1111 East Broad Street • Richmond, VA 23218-1199 • Patrick Henry Building
 For additional information, contact evacustomer@dgcs.virginia.gov or 1-866-289-7367.

Company Profile

Tell us about your company, including if you'd like to receive bidding opportunities and whether or not your company accepts charge cards.

Enter information as it appears on your W-9 form

▼ Company Profile

* Taxpayer ID Number(Type) : 451203698(EIN)

* Organization Type :

Supplemental Organization Type :

Company/DBA/Location Name: Check if same as above

* Company Legal Name :

* DBA/Location Name :

Web Address :

* Notification of Bids? :

* Accept Charge Cards? :

Tax Exempt :

Tax Address

* W-9 Address :

City/State/Zip :

Country :

Attachments - attach supporting files: W-9, W-8, etc.
Registration is not considered complete unless a Commonwealth of Virginia Substitute W-9 is received. Payments for goods or services may be impacted without a properly executed Commonwealth of Virginia Substitute W-9 form. Get the W-9 form here: http://www.doa.virginia.gov/General_Accounting/Forms/W9_COVSubstitute.pdf

Purchases under \$5,000 will be made via the Commonwealth's Small Purchase Charge Card (VISA). Standard vendor merchant fees apply.

Upload your W-9 here.

Registration is not considered complete unless the Commonwealth of Virginia Substitute W-9 is received. Payments for goods or services may be impacted without a properly executed Commonwealth of Virginia Substitute W-9 form found here:
http://www.doa.virginia.gov/General_Accounting/Forms/W9_COVSubstitute.pdf

User Information

By checking the box for *Notifications* you are requesting for the *User to be* sent bidding opportunities.

▼ Create your Login Profile

* First Name :

* Last Name :

* Email :

* Retype Email :

* Phone :

Fax :

Notifications : (Include this user for Bid Notifications)

* Password :

* Retype Password :

Department of General Services • Division of Purchases and Supply • eProcurement Bureau
1111 East Broad Street • Richmond, VA 23218-1199 • Patrick Henry Building
For additional information, contact evacustomer@dgcs.virginia.gov or 1-866-289-7367.

Ordering Information

If your *Ordering Address* is the same as the *W-9 address* you entered above, then click *Copy Tax Address*.

If your *Ordering Contact* is the same as the *Login Profile* you entered above, then click *Copy Login Profile Info*.

▼ Address Information

Ordering Address (Copy Tax Address)	Ordering Contact: (Copy Login Profile Info)
* Street 1 : <input type="text"/>	* Contact First Name : <input type="text"/>
Street 2 : <input type="text"/>	* Contact Last Name : <input type="text"/>
* City/State/Zip : <input type="text"/> <input type="text"/> <input type="text"/>	* Email : <input type="text"/>
* Country : <input type="text"/>	* Retype Email : <input type="text"/>
* Method of Notification : Email	* Phone : <input type="text"/>
	* Fax : <input type="text"/>

Receive bid notifications electronically by selecting *email* from the drop down menu.

Leave the default as “Yes” if your other addresses are the same as your *Ordering Address*.

If one of the addresses is NOT the same as your *Ordering Address* then select “No” from the drop down menu for that address type and complete all required fields.

Solicitation Address/Contact(same as Ordering?) Yes	
Physical Address/Contact(same as Ordering?) No	Physical Contact: (Copy Login Profile Info)
* Street 1 : <input type="text"/>	* Contact First Name : <input type="text"/>
Street 2 : <input type="text"/>	* Contact Last Name : <input type="text"/>
* City/State/Zip : <input type="text"/> <input type="text"/>	* Email : <input type="text"/>
* Country : <input type="text"/>	* Retype Email : <input type="text"/>
* Method of Notification : <input type="text"/>	* Phone : <input type="text"/>
	* Fax : <input type="text"/>
Payment Address/Contact(same as Ordering?) Yes	
Billing Address/Contact(same as Ordering?) Yes	

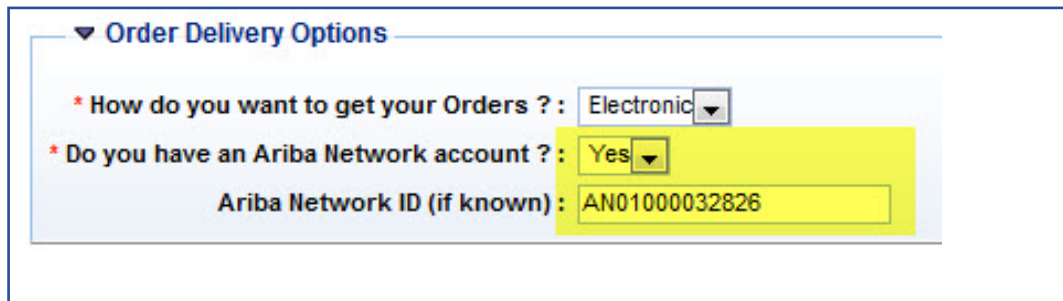
Department of General Services • Division of Purchases and Supply • eProcurement Bureau
1111 East Broad Street • Richmond, VA 23218-1199 • Patrick Henry Building
For additional information, contact evacustomer@dgsvirginia.gov or 1-866-289-7367.

Order Delivery Options

Receive your Orders Electronically

The Commonwealth of Virginia uses the Ariba Network, an Internet based service, to transmit Purchase Orders to our Vendors electronically. Electronic order routing is the preferred method of the Commonwealth.

If you have an Ariba Network Account choose “Electronic.” Select “Yes” to *Do you have an Ariba Network account?* and be sure to list your Ariba Network ID.



▼ Order Delivery Options

* How do you want to get your Orders ? : Electronic ▼

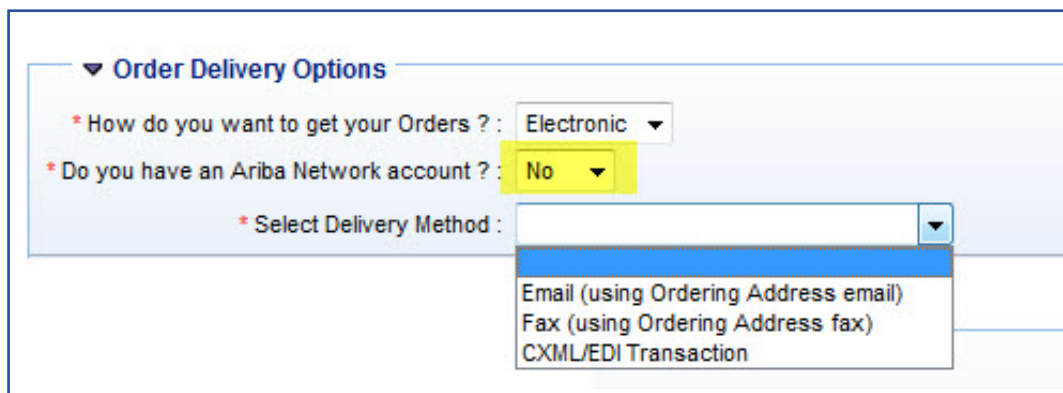
* Do you have an Ariba Network account ? : Yes ▼

Ariba Network ID (if known) : AN01000032826

If you do not have an Ariba Network Account choose “Electronic.” Select “No” to *Do you have an Ariba Network Account?* and select Email or Fax as your Delivery method. Orders will be routed to the Email or Fax you listed in your Ordering Address details.

By selecting “Electronic,” a free Ariba Network account will be pre-enabled for you. You will receive instructions on how to activate your Ariba account with your first order. With an Ariba account you will have access to Ariba’s vast network of users to whom you can also market your goods and services.

Choose “US Mail” only if the above methods do not fit your needs.



▼ Order Delivery Options

* How do you want to get your Orders ? : Electronic ▼

* Do you have an Ariba Network account ? : No ▼

* Select Delivery Method : ▼

- Email (using Ordering Address email)
- Fax (using Ordering Address fax)
- CXML/EDI Transaction

Service Area(s)

Tell Buyers where you do business

By choosing Zone 10, Statewide, you'll receive bid notifications from all over the state, not only from your area—providing you greater access to opportunities.

▼ **Service Area(s) and Commodity Profile**

Select Area(s) where you sell goods/services

Select Area(s)

Delete Service Area Zone

Choose

Select one or more Service Areas to associate to your company. To search for your Service Area, enter in a valid service area and click Search. Please click OK to save your changes.

Clear

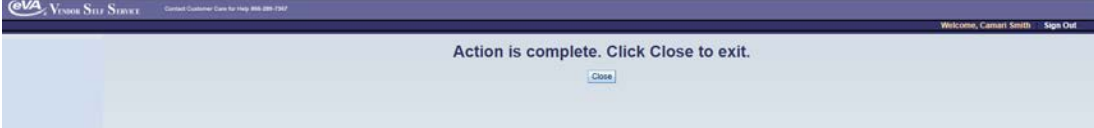

Service Area Zone : Search

Service Area Zone
<input checked="" type="checkbox"/> Statewide
<input type="checkbox"/> Cities: Chesapeake, Franklin, Hampton, Newport News, Norfolk, Poquoson, Portsmouth, Suffolk, Virginia Beach, and Williamsburg. Counties: Isle of Wight, James City, Southampton, Surry, Sussex, and York.
<input type="checkbox"/> Cities: Colonial Heights, HopeWell, Petersburg, and City of Richmond. Counties: Charles City, Chesterfield, Dinwiddie, Goochland, Hanover, Henrico, King William, New Kent, Powhatan, and Prince George.
<input type="checkbox"/> City: Fredericksburg. Counties: Caroline, Culpeper, Essex, Gloucester, King and Queen, King George, Lancaster, Madison, Mathews, Middlesex, Northumberland, Orange, Richmond County, Spotsylvania, and Stafford.
<input type="checkbox"/> Cities: Alexandria, Fairfax, Falls Church, Manassas, Manassas Park and Winchester. Counties: Arlington, Clarke, Fairfax, Fauquier, Frederick, Loudoun, Page, Prince William, Rappahannock, Shenandoah, and Stafford.
<input type="checkbox"/> Cities: Charlottesville, Harrisonburg, Staunton, and Waynesboro. Counties: Albemarle, Augusta, Fluvanna, Greene, Highland, Louisa, Nelson, and Rockingham.
<input type="checkbox"/> City: Emporia. Counties: Amelia, Brunswick, Buckingham, Charlotte, Cumberland, Greensville, Halifax, Lunenburg, Mecklenburg, Nottoway, and Prince Edward.
<input type="checkbox"/> Cities: City of Bedford, Buena Vista, Clifton Forge, Covington, Danville, Lexington, and Lynchburg. Counties: Alleghany, Amherst, Appomattox, Bath, Bedford County, Botetourt, Campbell, Pittsylvania, and Shenandoah.
<input type="checkbox"/> Cities: Galax, Martinsville, Radford, City of Roanoke, and Salem. Counties: Carroll, Craig, Floyd, Franklin, Giles, Henry, Montgomery, Patrick, Pulaski, and Roanoke County.
<input type="checkbox"/> Cities: Bristol and Norton. Counties: Bland, Buchanan, Dickenson, Grayson, Lee, Russell, Scott, Smyth, Tazewell, Washington, Wise, and Wythe.
<input type="checkbox"/> Counties: Accomack and Northampton

First Prev Next Last

OK Cancel

Department of General Services • Division of Purchases and Supply • eProcurement Bureau
1111 East Broad Street • Richmond, VA 23218-1199 • Patrick Henry Building
For additional information, contact evacustomer@dgsc.virginia.gov or 1-866-289-7367.

<p>Amend Response (cont'd)</p>	<p>ix. Review response and click Submit</p> <p>x. Confirm submission of response by clicking the Submit button on pop up.</p> <p>NOTE: You will receive an “Action is complete. Click Close to exit.” confirmation screen once your response has successfully submitted.</p>  <p>xi. Click Close</p>
<p>7 Withdraw Response</p>	<p>i. From the Home page, click the My Business dropdown box and click the Responses link (top of page).</p> <p>ii. Find the latest version of your solicitation response and click the View/Edit Response button.</p> <p>iii. Click Withdraw (top of page)</p> <p>iv. Confirm and click Withdraw on pop up</p> <p>NOTE: You will receive an “Action is complete. Click Close to exit.” confirmation screen once your response has successfully submitted.</p>  <p>v. Click Close</p> <p>vi. Status under Response will now be Withdrawn</p>
<p>8 Print Response</p>	<p>i. From the Home page, click the My Business dropdown box and click the Responses link (top of page).</p> <p>ii. Find the latest version of your solicitation response and click the View/Edit Response button.</p> <p>iii. Click Next: Line Items</p> <p>iv. Click Next: Subcontractor Plan</p> <p>v. Click Next: Review & Submit</p> <p>vi. Click Print</p> <p>vii. Click Exit</p>